IMPACT ASSESSMENT, MANAGEMENT, MITIGATION AND MONITORING MEASURES

Please note: While sections are provided for impacts on certain aspects of the environment and certain impacts, the sections should also be copied and completed for all other impacts.

(a) Impacts that may result from the planning, design and construction phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the planning, design and construction phase.

POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS

Nature of impact:
Disturbance to subsurface geological layers

Discussion:
Construction and excavation activities will affect the underlying geological layers on site to some extent. The depth of the rocks differs throughout the proposed area; therefore, the substrata will be affected differently.

Cumulative impacts:
It is not anticipated that the cumulative impact on subsurface geological layers will be high as the affected substrata is very shallow and the integrity of the underlying ground structures will thus not be sacrificed.

Mitigation:
Due to the nature of the impacts, not much can be done to mitigate the impact, only the severity of it can be managed.

- Mitigation and management for affecting geology is to ensure that removal of geological material and hardening are kept to a minimum and only within proposed development areas.
- Any cumulative impacts due to compaction/hardening of substrata such as damming of storm water elsewhere must be managed according to a site specific storm water management plan.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	5	5	5		
Magnitude	2	2	2	2		
Probability	4	2	4	2		
Significance	36-Medium	16-Low	36-Medium	16-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	0%		0%			
Irreplaceable loss of resources	2- Partly Replaceable		2-Partly Replaceable			
Can impacts be mitigated?	2-Partly, but impact on subsurface geological layers during excavations is inevitable.		2-Partly, but impact on subsurface geological layers during excavations is inevitable.			

Nature of impact:
Soil erosion

Discussion:
During construction site clearance, access roads for construction, workers camps, etc. will cause a disturbance to the soil and the vegetation cover. This disturbance, unless carefully managed, could spread as a result of unnecessary construction of additional access roads or site clearing outside of approved development footprint. Construction camps, if not fenced and restricted in size, could result in unnecessarily large areas being disturbed. Soil erosion could occur due to wind (wind erosion cause dust pollution) or due to overland flow should rains fall during construction.

Cumulative impacts:
Exposed soil surfaces due to clearing of vegetation could lead to soil erosion and if this is not mitigation could lead to the cumulative impact such as erosion of surrounding vegetation areas outside of the development footprint.

Mitigation:

- Demarcate no-go areas before any land clearing occurs under the supervision of an ECO. Demarcation must be clearly visible and effective and no-go area must remain demarcated throughout construction phase.
- Site clearance along the border of the no-go areas must be done under the supervision of an ECO.
- Access to roads and other areas must be controlled to avoid disturbance of areas outside the development footprint. Personnel should be restricted to the construction camp site and immediate construction areas only.
- Undertake specific erosion monitoring and maintenance throughout the construction phase as and if required.
- Undertake dust suppression as needed.
- Monitor soil erosion on a regular basis and rehabilitate impacted areas as soon as possible under supervision of appointed ECO.
- Appropriate and effective storm water management measures must be put in place to ensure that erosion and environmental degradations outside of the proposed development footprint area does not occur, but the storm water measures implemented must not impede storm water flow to such an extent that it is completely stopped. Current hydrological processes outside of the proposed development footprint area must continue to function as is.
- Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion.
- Should any signs of erosion or artificial recharge be observed the municipality must implemented rectification and preventions measures immediately and consult with the appointed ECO before implementing these measures.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1	5	1		
Magnitude	6	2	6	2		
Probability	4	2	4	2		
Significance	56 - Medium	8 - Low	56 - Medium	8 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%					
Irreplaceable loss of resources	2 Partly – while topsoil takes very long to redevelop, loss of topsoil can be prevented if correct mitigation measures are implemented					
Can impacts be mitigated?	2 Partly – Disturbance to topsoil during construction is inevitable, but erosion and increased storm water runoff can be mitigated.					

Nature of impact:
Compaction of soil

Discussion:
Heavy construction machinery will compact the soil on the site.

The compaction will lead to a change in soil structure and function. It will furthermore affect the micro-organisms in the soil detrimentally (these species may migrate to other areas where possible while some individuals may die). Soil compaction will lead to a lower growth rate in vegetation.

Cumulative impacts:
Soil compaction of areas outside of the development footprint can lead to lower growth rate in vegetation and erosion.

Mitigation:
- Undertake construction activities only in areas where required. Avoid all other areas outside of approved development footprint area.
- Cross areas with machinery as little as possible (work effectively) and make use of existing access and internal roads as far as possible.
- Rehabilitate impacted areas outside of approved development footprint area immediately upon construction completion.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the	
Duration	1	1	1	1		
Magnitude	6	4	6	4		

Probability	4	3	4	3	No-Go Alternative
Significance	36 - Medium	18 - Low	36-Medium	18-Low	
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated	
Reversibility	80%		80%		
Irreplaceable loss of resources	1-No		1-No		
Can impacts be mitigated?	2-Yes development and construction vehicles to be restricted only to demarcated footprint areas		2-Yes development and construction vehicles to be restricted only to demarcated footprint areas		

Nature of impact:
Increase in and accumulation of storm water runoff

Discussion:
Removal of materials from the freshwater ecosystems and vegetated areas may cause an increase in storm water runoff and excavations may lead to accumulation/damming thereof on the site and surrounds.

Cumulative impacts:
Increase in storm water runoff could cause erosion and/or damming of water which may lead to additional negative impacts like further habitat degradation and transformation.

Mitigation:

- Undertake storm water management measures as recommended in the environmental management program and site-specific storm water management plan.
- Monitor for erosion. Should erosion be present, undertake maintenance activities to rectify and prevent further erosion.
- Demarcate no-go areas before construction commences and maintain demarcation throughout construction phase.
- All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated.
- Monitor impacted areas for erosion and accumulation of water on an ongoing basis and implement mitigation measures as and if required.
- Stormwater discharge flow must be managed and restricted in such a manner that it does not cause erosion.
- Rehabilitate or stabilise eroded areas immediately to prevent increase/spread of erosion.
- Construction work (i.e. site clearance and construction) must be carried out and completed in the low flow and low rainfall season (mid to late summer) as far as possible to minimise the impact on the flow in the drainage line.
- Appropriate and effective storm water management measures must be put in place to ensure that erosion and environmental degradations outside of the proposed development footprint area does not occur, but the storm water measures implemented must not impede storm water flow to such an extent that it is completely stopped. Current hydrological processes outside of the proposed development footprint area must continue to function as is.
- Conduct and complete construction activities as far as possible during the dry summer months.
- Only excavate materials from proposed construction sites as according to approved layout plans.
- Do not remove any plant or soil materials from outside of the development areas.
- Do not create any additional access routes.

Criteria	**Layout Alternatives 1**		**Layout Alternative 2**		**No-Go Alternative**	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Extent	2	1	2	1	Neutral (Site remains as is)	
Duration	5	2	5	2		
Magnitude	10	6	10	6		
Probability	5	3	5	3		
Significance	85 - High	27 – Low	85 - High	27 – Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%					
Irreplaceable	2 Partly – While increase in storm water runoff is					

loss of resources	inevitable erosion can still be prevented and mitigated if required.	
Can impacts be mitigated?	2 Partly – While increase in storm water runoff is inevitable erosion can still be prevented and mitigated if required.	

Nature of impact:
Groundwater pollution

Discussion:
Potential groundwater pollution during construction due to machinery leakage etc.

Cumulative impacts:
Groundwater and/or surface water pollution

Mitigation:

- Ensure that all construction machinery are in good working order with no leakages
- Any fuel or hazardous materials must be stored in adequately lined and bunded areas

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	5	5	5		
Magnitude	2	2	2	2		
Probability	4	2	4	2		
Significance	36-Medium	16-Low	36-Medium	16-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1-No		1-No			
Can impacts be mitigated?	2-Yes completely by preventing pollution		2-Yes completely by preventing pollution			

POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS

Nature of impact:
Loss of drainage line (C) and associated riparian habitat as identified by the freshwater specialist

Discussion:
Watercourse C is being kept alive by artificial water sources that are not sustainable and the watercourse will, in the opinion of the specialist, cease to exist as soon as the planned upgrade of the WWTW happens and the overflowing drinking trough tap is turned off. Impacts to this watercourse are therefore of only transient importance. The apparent ecological advantage of the Alternative Layout therefore in enclosing the watercourse in parkland is of no freshwater significance as the artificially sustained watercourse will soon cease to exist. There is therefore no material difference between the two proposed layouts in terms of freshwater constraints and both layouts were found to be of Very Low (negative) impact for every impact assessed, with or without mitigation where mitigation has been provided. The provided mitigation measures will reduce impact however within the Very Low category, and it is therefore recommended that the proposed development be approved on condition that the proposed mitigation measures be implemented.

Cumulative impacts:

- Impact on flow regime
- Impact on water quality
- Impact on biota – the animal and plant life of particular region or habitat
- Impact on wetland and riparian habitat

Mitigation:

- Clear and construct in summer when rainfall is minimal.
- Undertake storm water management measures as required.
- Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Neutral (Site remains as is)	
Duration	5	1	5	1		
Magnitude	4	2	4	2		
Probability	5	5	5	5		

Significance	55- Medium	20-Low	55- Medium	20-Low	
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated	
Reversibility	100%				
Irreplaceable loss of resources	2-Resource will be partly lost				
Can impacts be mitigated?	2 -Partly				

Nature of potential impact:

Impact of proposed development aquatic NFEPAs and/or Critical Biodiversity Areas ("CBA') and Ecological Support Areas ("ESA").

Discussion:

Watercourse C that will be developed upon during the proposed development is mapped as a aquatic CBA, ESA and non-perennial river NFEPA

Cumulative impacts

Loss of aquatic CBA, ESA and non-perennial river NFEPA.

Mitigation:

- All construction activities and personnel on site to stay within demarcated construction areas.
- Proper waste bins to be provided to construction staff and all waste to be regularly removed to municipal landfill site.
- Monitor for erosion. Should erosion be present, undertake maintenance activities such as planting of vegetation.
- All roads need to be maintained and monitored. Visible signs of possible erosion must be immediately rehabilitated.
- Any oil or diesel spills etc. must be reported to the site manager and rehabilitation measures must be taken immediately and contaminated soil disposed of at a licensed landfill site.
- The construction camp where construction vehicles are parked must be at least 30m away from the watercourse as measured from the edge of the watercourse.
- Contaminated runoff from the construction site(s) should be prevented from entering the stream.
- The construction camp should be located at least 32m away from the stream top of bank.
- All potential hazardous materials i.e. fuels, cement etc. should be properly stored and contained within the construction camp.
- Disposal of waste from the site should also be properly managed.
- These measures should be addressed, implemented and monitored in terms of the EMP for the construction phase.
- Clear and construct in summer when rainfall is minimal.
- Undertake storm water management measures as required.
- Rehabilitate or stabilise eroded areas immediately to prevent increase in erosion.
- Construction vehicles must be checked for leakages on a daily basis and repaired before allowed to work within watercourses if a leakage is detected.
- If any fuel or hazardous materials is spilled on site it must be treated as according to EMP hazardous spill management requirements.
- The cement mixing area must to take place within demarcated cement mixing area that is impermeable and has a berm so that no cement mix runoff water escapes from cement mixing area.

Criteria	**Layout Alternatives 1**		**Layout Alternative 2**		**No-Go Alternative**	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Extent	2	1	2	1	Neutral (Site remains as is)	
Duration	5	1	5	1		
Magnitude	10	2	10	2		
Probability	5	2	5	2		
Significance	85 - High	8 - Low	85 - High	8 - Low		
Status	High Negative Significance without Mitigation	Low Negative Significance with Mitigation	High Negative Significance without Mitigation	Low Negative Significance with Mitigation		
Reversibility	100%					

Irreplaceable loss of resources	2-Resource will be partly lost	
Can impacts be mitigated?	2 -Partly	

Nature of potential impact:
Impact of proposed activities on terrestrial indigenous vegetation and associated fauna and avifauna habitat

Discussion:
Loss of indigenous vegetation and habitat leading to disruption in ecological processes

Cumulative impacts:
Displacement of fauna and avifauna inhabiting the site and surrounds due to habitat destruction.
Erosion of the site and surrounds dur to site clearance

Mitigation:

- The project implementation process should be subject to standard Environmental Management Programme (EMP) prescripts and conditions and only proceed under supervision of a competent and diligent Environmental Control Officer during the construction phase.
- Clearly demarcate proposed development area before site clearance commences and remain within demarcated development footprint area throughout construction and operational phases
- Landscaping of the site must be done with indigenous trees and vegetation under the supervision of a qualified botanical specialist/or landscaper familiar with indigenous vegetation of the areas.
- Storm water runoff from the site must be controlled in order to prevent erosion and leaching into the surrounding area.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	**1**	1	**1**	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	5	5	5		
Magnitude	6	2	6	2		
Probability	5	2	5	2		
Significance	60 - High	16 - Low	60 - High	16 - Low		
Status	High Negative Significance without Mitigation	Low Negative Significance with Mitigation	High Negative Significance without Mitigation	Low Negative Significance with Mitigation		
Reversibility	100% Reversible		100% Reversible			
Irreplaceable loss of resources	2 – Partly, some loss of indigenous vegetation will occur		2 – Partly, some loss of indigenous vegetation will occur			
Can impacts be mitigated?	2 – Partly		2 – Partly			

Nature of potential impact:
Impact of proposed activities on terrestrial Critical Biodiversity and Ecological Support Areas

Discussion:
Loss of terrestrial CBA and/or ESA leading to disruption in ecological processes

Cumulative impacts:
Loss of undeveloped terrestrial habitat leading to disruption and/or destruction of ecological processes

Mitigation:

- The project implementation process should be subject to standard Environmental Management Programme (EMP) prescripts and conditions and only proceed under supervision of a competent and diligent Environmental Control Officer during the construction phase.
- Clearly demarcate proposed development area before site clearance commences and remain within demarcated development footprint area throughout construction and operational phases
- Landscaping of the site must be done with indigenous trees and vegetation under the

supervision of a qualified botanical specialist/or landscaper familiar with indigenous vegetation of the areas.

- Storm water runoff from the site must be controlled in order to prevent erosion and leaching into the surrounding area.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	**1**	1	**1**	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	5	5	5		
Magnitude	6	2	6	2		
Probability	5	2	5	2		
Significance	60 - High	16 - Low	60 - High	16 - Low		
Status	High Negative Significance without Mitigation	Low Negative Significance with Mitigation	High Negative Significance without Mitigation	Low Negative Significance with Mitigation		
Reversibility	100% Reversible		100% Reversible			
Irreplaceable loss of resources	2 – Partly, some loss of indigenous vegetation will occur		2 – Partly, some loss of indigenous vegetation will occur			
Can impacts be mitigated?	2 – Partly		2 – Partly			

Nature of impact:
Introduction of alien and weed plant species

Discussion:
Declared weeds or alien trees may be transported onto the site and spread to surrounding areas during construction. This may have management and cost impacts on such properties. Introduction of alien plant species via vehicular traffic is an important aspect that needs to be considered. Alien grass seeds for example may become attached to vehicles and be transported to site or be brought on to site in building materials such as sand. Without monitoring and control this could become problematic.

Cumulative impacts:
Loss of potential biodiversity, ecosystems and natural habitat due to the spread of invader plants.

Mitigation:
The mitigation measures mentioned below will help reduce the risk of introductions and will ensure that should introductions occur they are controlled timeously:

- Undertake construction activities only in identified and specifically demarcated areas.
- Do not import and use infill material on site containing alien or weed vegetation seeds/plants.
- An important aspect of on-going maintenance is the monitoring of the rehabilitated sites and access road verges for alien plant species.
- Wherever possible rehabilitation of disturbed area should be done with seeds collected from indigenous vegetation in the area during rehabilitation.
- Implement an ongoing alien eradication program for the areas to be rehabilitated.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	2	3	2	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1	5	1		
Magnitude	6	4	6	4		
Probability	4	3	4	3		
Significance	56- Medium	21 - Low	56- Medium	21 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1-Will not be lost		1-Will not be lost			
Can impacts be mitigated?	1-Yes, by implementing an alien eradication plan and continuing monitoring of		1-Yes, by implementing an alien eradication plan and continuing monitoring of			

	alien regrowth	alien regrowth	

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS

Nature of impact:
Agricultural impacts

Discussion:
The site was is currently being used for cattle grazing, 6.8ha of grazing land will be lost.

Cumulative impacts:
Loss of potential agricultural land

Mitigation:
Loss of the potential agricultural land cannot be avoided completely only limited by limiting the size of the proposed development area and restricting all activities to areas outside of the proposed no-go/no-development areas.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1	5	1		
Magnitude	6	4	6	4		
Probability	5	5	5	5		
Significance	65 - High	30 - Low	65 - High	30 - Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	2 – Partial loss		2 – Partial loss			
Can impacts be mitigated?	2 - Partly		2 - Partly			

Nature of impact:
Increased temporary construction jobs

Discussion:
Temporary construction jobs will be created.

Cumulative impacts:
- Influx of contract workers due to lack of skills.
- Influx of job seekers due to jobs created.

Mitigation:
- Local contractors, employing or seeking to employ local (historically disadvantaged individuals (HDIs) from the region who are suitably qualified, should get preference.
- The municipality, local community and local community organizations should be informed of the project and potential job opportunities by the developer.

Criteria	Layout Alternatives 1 and 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Status	-	Due to the job creation only being of an temporary nature this impact is rated as a medium positive significance	Medium Negative Impact, no construction to take place so no temporary jobs to be created.	

Nature of impact:
Increased traffic due to the construction activities requiring various vehicles to come onto and leave the site.

Discussion:
The construction machinery will only have a traffic impact on delivery to, and collection from the site and are therefore regarded as negligible

Cumulative impacts:
The minor increase in traffic volumes at certain times of day will add to the existing traffic volumes. As

the existing traffic volumes are relatively low, this cumulative impact is not expected to be significant.

Mitigation:

- Adhere to speed limit and road rules.
- Work during normal working hours and only use demarcated access and internal roads
- Only allow drivers with valid driver's licenses to drive and/or operate construction vehicles

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	2	1	5	1		
Magnitude	4	4	6	4		
Probability	4	3	5	5		
Significance	32 - Medium	18 - Low	65 - High	30 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if not mitigated	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1 – No loss		1 – No loss			
Can impacts be mitigated?	2 - Partly		2 - Partly			

Nature of impact:

Impact of construction workers on local community safety and security

Discussion:

Construction workers on site may pose a safety and security risk to neighbouring communities if not managed

Cumulative impacts:

Theft of property of neighbouring communities.

Mitigation:

As a proclaimed work site the workers should be restricted to remain within the work site during working hours. A penalty system should be implemented on site to penalise workers who is guilty of trespassing, theft etc.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1	5	1		
Magnitude	6	0	6	0		
Probability	4	2	4	2		
Significance	56- Medium	4-Low	56- Medium	4-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1-Will not be lost		1-Will not be lost			
Can impacts be mitigated?	1-Yes, by implementing a penalty system and restricting workers movements to remain onsite during working hours.		1-Yes, by implementing a penalty system and restricting workers movements to remain onsite during working hours.			

Nature of impact:

Impact of litter or waste from the construction site on the surrounding communities.

Discussion:

Construction workers and activities on site may cause polluting of surrounding areas with litter and waste from the construction site.

Cumulative impacts:

Litter and waste polluting the surrounding areas.

Mitigation:

- Appropriate refuse disposable facilities shall be provided at the proposed construction site

- Daily clearance of construction litter on the site and surrounds shall be undertaken.
- Waste to be disposed of via closed containers/vehicles at the municipal landfill site.

Criteria	Layout Alternatives 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1	5	1		
Magnitude	6	0	6	0		
Probability	4	2	4	2		
Significance	56- Medium	4-Low	56- Medium	4-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1-Will not be lost		1-Will not be lost			
Can impacts be mitigated?	1-Yes, by implementing a penalty system and restricting workers movements to remain onsite during working hours.		1-Yes, by implementing a penalty system and restricting workers movements to remain onsite during working hours.			

Nature of impact:
Dust and emissions pollution arising from ground clearing and other construction activities

Discussion:
It is anticipated that construction will occur during the dry season in order to prevent construction delays due to the rains. As such, dust will be present on the site and the access roads.

Should the construction machinery not be properly maintained, emissions pollution may occur.

Either one or a combination of the above may affect the surrounding land users/ owners if not managed.

Cumulative impacts:
Dust and emissions impacts on surrounding environment and community.

Mitigation:
- Undertake dust suppression if necessary. If dust suppression and/or surface hardening is undertaken by using water only non-potable water resources must be used.
- Only clear the areas to be developed upon, no additional areas outside of the proposed development footprint area may be cleared.
- Plant additional vegetation where needed after construction during site rehabilitation if required.
- Service and maintain construction vehicles on a frequent basis.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	2	1	2	1		
Magnitude	4	4	4	4		
Probability	4	3	4	3		
Significance	32 - Medium	18 - Low	32 - Medium	18 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if not mitigated	Medium negative significance if not mitigated	Low negative significance if not mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1 – No loss		1 – No loss			
Can impacts be mitigated?	2 - Partly		2 - Partly			

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS

Nature of impact:
The potential impact of the proposed development on archaeological, paleontological and heritage remains

Discussion:
Notice of Intent to Develop submitted to Heritage Western Cape and confirmation was received that HWC agrees there are no significant heritage resources on site that will be impacted upon by the proposed development and no further heritage impacts assessments are required.

Cumulative impacts:
Destruction of cultural- historical features at the site will contribute to the loss of such features in the general area due to other non-related activities. This can at all times be mitigated to prevent/ minimise the loss of such features.

Mitigation:
Should any burials, fossils or other historical material be encountered during construction, work must cease immediately and HWC must be notified.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1	5	1		
Magnitude	6	0	6	0		
Probability	5	1	5	1		
Significance	65 - High	2-Low	65 - High	2-Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated	High negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	0% reversibility – once the historical features are destroyed, it cannot be recovered.		0% reversibility – once the historical features are destroyed, it cannot be recovered.			
Irreplaceable loss of resources	3- Yes, completely irreplaceable		3- Yes, completely irreplaceable			
Can impacts be mitigated?	1-Yes		1-Yes			

POTENTIAL IMPACTS OF NOISE

Nature of impact:
Noise due to construction machinery

Discussion:
Construction machinery may cause noise disturbance to the directly adjacent land users/ owners. It is not anticipated that the noise will be considerable and will only be temporary.

Cumulative impacts:
Noise due to construction activities may cause a nuisance to adjacent residential areas.

Mitigation:

- Construction activities should be restricted to weekday working hours.
- Machinery and vehicles should be regularly maintained to prevent excessive noise.
- All machinery and work activities must adhere to the requirements of the noise regulations.
- Construction not to take place during peak holiday season middle Dec – middle January.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	2	3	2	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	1	1	1	1		
Magnitude	4	2	4	2		
Probability	3	2	3	2		
Significance	24- Low	10-Low	24-Low	10-Low		
Status	Low negative significance if not mitigated	Low negative significance if mitigated	Low negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	This will not be a long term impact nor will it have an impact on the natural		This will not be a long term impact nor will it have an impact on the natural			

	processes. It is thus 100% reversible.	processes. It is thus 100% reversible.	
Irreplaceable loss of resources	1- No resources will be lost.	1- No resources will be lost.	
Can impacts be mitigated?	2 Partly – Construction noise will occur but it is not expected to be significant	2 Partly – Construction noise will occur but it is not expected to be significant	

POTENTIAL VISUAL IMPACTS

Nature of impact:
Visual impact of construction of proposed serviced erven.

Discussion:
The surrounding land users/ owners will be exposed to the presence of the construction machinery. It is not anticipated that the visual impact of the construction activities will be very significant as it will only be temporary until development is complete.

Cumulative impacts:
Unsightly construction camp/s and activities on construction site

Mitigation:
- Proposed construction activities must be limited to development footprint site.
- Construction camp must be neatly fenced and construction site must be neat and tidy.
- Stockpile construction materials in one specific area.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	1	1	1	1		
Magnitude	6	2	6	2		
Probability	4	3	4	3		
Significance	40-Medium	12-Low	40-Medium	12-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	2- Partial loss due to unavoidable visual impact		2- Partial loss due to unavoidable visual impact			
Can impacts be mitigated?	2 Partly – Construction camp and activities will have a visual impact but significance can be mitigated		2 Partly – Construction camp and activities will have a visual impact but significance can be mitigated			

(b) Impacts that may result from the operational/maintenance phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the operational phase.

POTENTIAL IMPACTS ON GEOGRAPHICAL, PHYSICAL AND BIOLOGICAL ASPECTS

Nature of impact:
Increase in storm water runoff due to hardening of surfaces which may lead to erosion of surrounding areas

Discussion:
Due to an increase in hardened surfaces stormwater runoff and speed may increase which may lead to erosion of surrounding environments if not mitigated.

Cumulative impacts:
Soil erosion due to hardening of surfaces could lead to further degradation of surrounding indigenous vegetation areas.

Soil erosion may lead to loss in topsoil and impact environmental processes of adjacent sensitive environments.

Mitigation:

- Monitor for erosion of surrounding undeveloped areas and implement storm water management measures as recommended in the environmental management program.
- Stormwater discharge flow must be managed and restricted in such a manner that it does not cause erosion.
- Rehabilitate or stabilise eroded areas immediately to prevent increase/spread of erosion.
- Only use existing access road to the site for operational purposes and avoid disturbance of "new" areas outside the existing access roads and infrastructure footprint.
- Direct all stormwater into the proposed retention pond
- Construct the retention pond from permeable materials such that maximum groundwater/interflow still occurs.
- Stormwater infrastructure must not cause erosion of the surrounding remaining undeveloped areas, but still allow current hydrological processes to continue as is.
- The municipality must maintain all stormwater infrastructure on a regular basis to ensure that it is working effectively and is not blocked with waste.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	3	1		
Duration	5	1	5	1		
Magnitude	6	2	6	2		
Probability	4	2	4	2		
Significance	56 - Medium	8 - Low	56 - Medium	8 - Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated	Neutral (Site remains as is)	
Reversibility	100%					
Irreplaceable loss of resources	2 Partly – While increase in storm water runoff is inevitable erosion can still be prevented and mitigated if required.					
Can impacts be mitigated?	2 Partly – While increase in storm water runoff is inevitable erosion can still be prevented and mitigated if required.					

Nature of impact:
Groundwater pollution

Discussion:
The potential impact of leachate from graves on the Sarahsrivier and its floodplain wetlands downslope was also assessed. Given that the proposed sites for the two layouts do not produce runoff that enters the Sarahsrivier, that floodplain wetlands are usually supplied primarily by the river and not by groundwater or interflow, given that the railway line between the river and the proposed sites forms a substantial barrier to subsurface flow and given the phased installation of graves over several years, it is unlikely that much leachate will reach the Sarahsrivier over 400m away, if at all. The impact significance for this potential impact was therefore found to be Very Low (negative) regardless of the layout

Cumulative impacts:
Leachate from graves leading to groundwater and/or surface water pollution

Mitigation:

- No mitigation required as per freshwater impact assessment findings.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	5	5	5		
Magnitude	2	2	2	2		
Probability	4	2	4	2		
Significance	36-Medium	16-Low	36-Medium	16-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1-No		1-No			
Can impacts be mitigated?	2-Yes completely by preventing pollution		2-Yes completely by preventing pollution			

Nature of potential impact:
Spread of alien invasive vegetation associated with the soil disturbance caused by construction leading to habitat degradation

Discussion:
The primary operational phase impacts are likely to be the spread of alien invasive vegetation associated with the soil disturbance caused by construction.

Cumulative impacts:
Increase in alien vegetation encroachment leading to decrease in natural habitat and further displacement of fauna and avifauna

Mitigation:

- The municipality as landowner/s must adhere to his/her legal obligations to actively eradicate and manage alien tree infestations present on the applicable and surrounding properties.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	5	1	5	1		
Magnitude	6	2	6	2		
Probability	4	2	4	2		
Significance	56-Medium	8-Low	56-Medium	8-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	2-Partial loss of resources but can be rehabilitated		2-Partial loss of resources but can be rehabilitated			
Can impacts be mitigated?	1- Completely		1- Completely			

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS

Nature of impact:
Increase in cemetery space for the town of Ashton and surrounds

Discussion:
The proposed development will provide much needed cemetery space for the town of Ashton and surrounds

Cumulative impacts:
The reason for this development is to provide the town of Ashton and surrounds with additional cemetery space as current cemeteries have either reached full capacity or is very close to full capacity.

Mitigation:
Ongoing maintenance of services infrastructure.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without	With	Without	With	Without	With

	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation	Mitigation
Status	-	High positive significance	-	High positive significance	High Negative Impact, no provision of low income housing for the town of Napier	

Nature of impact:
Increased traffic due to proposed cemetery expansion.

Discussion:
It is not expected that the proposed development will have a significant impact on the surrounding road network in terms of the expected increase in traffic volumes.

Cumulative impacts:
The minor increase in traffic volumes at certain times of day will add to the existing traffic volumes. As the existing traffic volumes are relatively low, this cumulative impact is not considerable

Mitigation:
Implement regulation of traffic laws as per current practise.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	2	1	Neutral (Site remains as is)	
Duration	5	5	5	5		
Magnitude	4	2	6	4		
Probability	4	2	4	2		
Significance	44- Medium	8- Low	52-Medium	20-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1-Will not be lost		1-Will not be lost			
Can impacts be mitigated?	2 Partly – Traffic Impact will occur, but will not be significant due to very low existing traffic and scale of proposed development.		2 Partly – Traffic Impact will occur, but will not be significant due to very low existing traffic and scale of proposed development.			

Nature of impact:
Noise due to cemetery expansion.

Discussion:
Once the cemetery is operations this will lead to additional noise in the area during burials.

Cumulative impacts:
It is not expected that the noise that will be created during burial services will be significant as it will not be in excess of current residential noise produced by existing residential areas.

Mitigation:
Municipality to implement law enforcement as/if required to maintain average noise levels.

Criteria	Layout Alternatives1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	2	3	2	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	1	1	1	1		
Magnitude	4	2	4	2		
Probability	3	2	3	2		
Significance	24- Low	10-Low	24-Low	10-Low		
Status	Low negative significance if not mitigated	Low negative significance if mitigated	Low negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1- No resources will be lost.		1- No resources will be lost.			
Can impacts be mitigated?	2 Partly – Noise will occur but it is not expected to be significant		2 Partly – Noise will occur but it is not expected to be significant			

Nature of impact:
Additional load on existing municipal services infrastructure such as electricity, water, sewage and waste handling.

Discussion:
The addition of the proposed cemetery will lead to increased pressure on municipal services infrastructure in terms of electricity and water provision, sewage and waste handling facilities.

Cumulative impacts:
Increased pressure on municipal services infrastructure i.e. water, electricity and waste disposal services.

Mitigation:

- The municipality to ensure that adequate municipal services infrastructure exists to service the proposed development and to maintain existing and all new services infrastructure as proposed.
- Upgrade and maintain municipal services infrastructure as and when required.

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	3	1	3	1	Neutral (Site remains as is)	
Duration	5	5	5	5		
Magnitude	8	1	8	1		
Probability	5	5	5	5		
Significance	80 - High	35 – Medium/Low	80 - High	35 – Medium/Low		
Status	High negative significance if not mitigated	Medium to Low negative significance if mitigated	High negative significance if not mitigated	Medium to Low negative significance if mitigated		
Reversibility	100%					
Irreplaceable loss of resources	1 – Resource will not be lost					
Can impacts be mitigated?	2 Partly – While increase in demand for municipal services will occur the significance thereof can mitigated by confirming that current services infrastructure is adequate to accommodate proposed development and by ongoing maintenance of existing and proposed services infrastructure.					

Nature of impact:
Planning considerations in terms of potential future expansion of the municipal WWTW.

Discussion:
If layout alternative 1 should proceed the current wastewater treatment works will not have sufficient space to expand in the future as it will be surround by cemetery development of 3 sides and the with limited expansion area left in-between die current WWTW and the R60 road. Layout alternative 2 allows for sufficient space left for the WWTW to expand southeast in the future.

Cumulative impacts:
Impact on future planning considerations.

Mitigation:
Implement layout alternative 2

Criteria	Layout Alternative 1		Layout Alternative 2		No-Go Alternative	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Extent	2	1	1	1	Neutral (Site remains as is)	
Duration	5	5	0	0		
Magnitude	10	10	0	0		
Probability	5	5	1	1		
Significance	85- High	85-High	1-Low	1-Low		
Status	High negative significance if not mitigated	Low negative significance if mitigated	Highnegative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%		100%			
Irreplaceable loss of resources	1-Will not be lost		1-Will not be lost			
Can impacts be mitigated?	Not if layout alternative 1 as it is currently is		Won't be necessary if layout alternative 2 is			

	implemented	implemented	

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS

It is not anticipated that any further impact on the cultural-historical aspects of the site will occur during this phase, however should any burials, fossils or other historical material be encountered during maintenance activities of the operational phase, work must cease immediately and HWC must be contacted.

POTENTIAL VISUAL IMPACTS

Nature of impact: Visual impact of proposed cemetery development.						
Discussion: It is not anticipated that the visual impact of the proposed cemetery development will have a significant visual impact as it will blend in with adjacent existing cemetery						
Cumulative impacts: Visual impact of expanded cemetery area.						
Mitigation: • Proposed development activities must be limited to the proposed development footprint site. • If any areas outside of the proposed development footprint area is disturbed it must be immediately rehabilitated. • Municipality to maintain cemetery development and infrastructure to ensure that it is clean and neat.						
Criteria	**Layout Alternative 1**		**Layout Alternative 2**		**No-Go Alternative**	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Extent	3	1	3	1	Not Applicable (No construction activities to take place during the No-Go Alternative)	
Duration	1	1	1	1		
Magnitude	6	2	6	2		
Probability	4	3	4	3		
Significance	40-Medium	12-Low	40-Medium	12-Low		
Status	Medium negative significance if not mitigated	Low negative significance if mitigated	Medium negative significance if not mitigated	Low negative significance if mitigated		
Reversibility	100%					
Irreplaceable loss of resources	2- Partial loss due to unavoidable visual impact					
Can impacts be mitigated?	2 Partly – all infrastructure to be maintained to remain in a clean and neat condition.					

(c) Impacts that may result from the decommissioning and closure phase (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase

POTENTIAL IMPACTS ON GEOGRAPHICAL AND PHYSICAL ASPECTS

It is not anticipated that decommissioning will occur in the near future. Should decommissioning occur, the expected impacts are similar to those listed in the construction phase above with the additional positive impact of rehabilitating the decommissioned area to a near natural/indigenous state and negative impact of destroying houses, infrastructure and serviced erven. Impacts must be mitigated and managed according to the best practise techniques/management measures available for that time.

POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS

The decommissioning of proposed developments is not anticipated in the near future. Impacts during this phase will however be similar to that of the construction phase. Mitigation and management measures will be related to the technology of the day and

needs to be discussed at such time as decommissioning will occur. All structures must be removed and the area rehabilitated to a near natural state (dependent upon the end land use agreement). Waste, where possible must be recycled. All concrete introduced must be removed off site to a licensed facility

POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS

Potential decommissioning of the proposed developments will mean that the Municipality will not be able to provide certain essential services i.e. cemetery space to the public. Decommissioning is therefore highly unlikely and undesirable.

POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS

Decommissioning of a cemetery site with have a high negative significance on cultural and historical aspects and is therefore highly unlikely

POTENTIAL IMPACTS OF NOISE

The impacts and their significance anticipated to occur during this phase will be the same as that of the construction phase. Mitigation measures during this phase will remain the same as for the construction phase.

POTENTIAL VISUAL IMPACTS

The impacts and their significance anticipated to occur during this phase will be the same as that of the construction phase. Mitigation measures during this phase will remain the same as for the construction phase, with the added potential positive impact of the site to be rehabilitated to a more "natural" state.

(d) The No-Development Option- *The No-Development option will result in the local communities having to travel long distances to find available burial space in existing cemeteries elsewhere once the current cemeteries at Ashton have reached full capacity. Alternatively, some burials are taking place illegally (outside of formal cemeteries), which will increase once current local cemeteries reach full capacity if additional cemetery areas are not established. Leading to a high negative significance impact.*