PROPOSED DEVELOPMENT OF AN OXIDATION POND SYSTEM AND SEWAGE LINES, SCHWEIZER RENEKE, NORTHWEST PROVINCE

APPENDIX F: IMPACT ASSESSMENT

Prepared for:

On behalf of:

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Abbreviations:

AIS - Alien and Invasive Species

BA - Basic Assessment

ECO - Environmental Compliance Officer

EIA - Environmental Impact Assessment

ESA - Environmental Site Agent

EMP'r - Environmental Management Programme Report

GPS - Global Positioning System

IA - Impact Assessment

Impact Assessment Methodology

For each potential impact, the **EXTENT** (Spatial scale), **MAGNITUDE** (degree of the impact), **DURATION** (time scale), **PROBABILITY** (occurrence), **IRREPLACEABILITY** (loss of resources) and the **REVERSIBILITY** (degree to which the proposed impact can be reversed) will be assessed by the EAP as well as the Specialists. The assessment of the above criteria will be used to determine the significance of each impact, with and without the implementation of the proposed mitigation measures. The scale to be used to assess these variables and to define the rating categories are tabulated in **Table 1** and **Table 2** below.

Evaluation component	Ranking scale and description (criteria)
MAGNITUDE of NEGATIVE IMPACT (at the indicated spatial scale)	**10 - Very high**: Bio-physical and/or social functions and/or processes might be *severely* altered. **8 - High**: Bio-physical and/or social functions and/or processes might be *considerably* altered. **6 - Medium**: Bio-physical and/or social functions and/or processes might be *notably* altered. **4 - Low** : Bio-physical and/or social functions and/or processes might be *slightly* altered. **2 - Very Low**: Bio-physical and/or social functions and/or processes might be *negligibly* altered. **0 - Zero**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
MAGNITUDE of POSITIVE IMPACT (at the indicated spatial scale)	**10 - Very high (positive)**: Bio-physical and/or social functions and/or processes might be *substantially* enhanced. **8 - High (positive)**: Bio-physical and/or social functions and/or processes might be *considerably* enhanced. **6 - Medium (positive)**: Bio-physical and/or social functions and/or processes might be *notably* enhanced. **4 - Low (positive)**: Bio-physical and/or social functions and/or processes might be *slightly* enhanced. **2 - Very Low (positive)**: Bio-physical and/or social functions and/or processes might be *negligibly* enhanced. **0 - Zero (positive)**: Bio-physical and/or social functions and/or processes will remain *unaltered.*
DURATION	**5 - Permanent** **4 - Long term**: Impact ceases after operational phase/life of the activity > 60 years. **3 - Medium term**: Impact might occur during the operational phase/life of the activity – 60 years. **2 - Short term**: Impact might occur during the construction phase - < 3 years. **1 - Immediate**
EXTENT (or spatial scale/influence of impact)	**5 - International**: Beyond National boundaries. **4 - National**: Beyond Provincial boundaries and within National boundaries. **3 - Regional**: Beyond 5 km of the proposed development and within Provincial boundaries. **2 - Local**: Within 5 km of the proposed development. **1 - Site-specific**: On site or within 100 m of the site boundary. **0** - None
IRREPLACEABLE loss of resources	**5 – Definite** loss of irreplaceable resources. **4 – High** potential for loss of irreplaceable resources. **3 – Moderate** potential for loss of irreplaceable resources. **2 – Low** potential for loss of irreplaceable resources. **1 – Very low** potential for loss of irreplaceable resources. **0 - None**
REVERSIBILITY of impact	**5 –** Impact **cannot** be reversed. **4 – Low** potential that impact might be reversed. **3 – Moderate** potential that impact might be reversed.

	2 – High potential that impact might be reversed. **1 –** Impact **will be** reversible. **0 –** No impact.
PROBABILITY (of occurrence)	**5 - Definite**: >95% chance of the potential impact occurring. **4 - High probability**: 75% - 95% chance of the potential impact occurring. **3 - Medium probability**: 25% - 75% chance of the potential impact occurring **2 - Low probability**: 5% - 25% chance of the potential impact occurring. **1 - Improbable**: <5% chance of the potential impact occurring.
Evaluation component	**Ranking scale and description (criteria)**
CUMULATIVE impacts	**High**: The activity is one of several similar past, present or future activities in the same geographical area, and might contribute to a very significant combined impact on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Medium**: The activity is one of a few similar past, present or future activities in the same geographical area, and might have a combined impact of moderate significance on the natural, cultural, and/or socio-economic resources of local, regional or national concern. **Low**: The activity is localised and might have a negligible cumulative impact. **None**: No cumulative impact on the environment.

Table 1: Evaluation components, ranking scales and descriptions (criteria).

Significance Points	Environmental Significance	Description
125 – 150	**Very high (VH)**	An impact of very high significance will mean that the project cannot proceed, and that impacts are irreversible, regardless of available mitigation options.
100 – 124	**High (H)**	An impact of high significance which could influence a decision about whether or not to proceed with the proposed project, regardless of available mitigation options.
75 – 99	**Medium-high (MH)**	If left unmanaged, an impact of medium-high significance could influence a decision about whether or not to proceed with a proposed project. Mitigation options should be relooked.
40 – 74	**Medium (M)**	If left unmanaged, an impact of moderate significance could influence a decision about whether or not to proceed with a proposed project.
<40	**Low (L)**	An impact of low is likely to contribute to positive decisions about whether or not to proceed with the project. It will have little real effect and is unlikely to have an influence on project design or alternative motivation.
+	**Positive impact (+)**	A positive impact is likely to result in a positive consequence/effect, and is likely to contribute to positive decisions about whether or not to proceed with the project.

Table 2: Definition of significance ratings (positive and negative).

Once the evaluation components have been ranked for each potential impact, the significance of each potential impact will be assessed (or calculated) using the following formula:

- **SP (Significance Points) = (Magnitude + Duration + extent + irreplaceability + reversibility) x probability.**

The maximum value is 150 SP (Significance Points). The unmitigated and mitigated scenarios for each potential environmental impact should be rated as per **Table 2** above.

1. POTENTIAL IMPACTS DURING THE CONSTRUCTION PHASE

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON GEOGRAPHICAL, GEOLOGICAL AND PHYSICAL ASPECTS:					
Nature of impact: Negative impact of haphazard placement of infrastructure on the environment.	**Activity:** The establishment of a main site office and storage site during the construction period will ensure that the poor placement of materials and infrastructure will be avoided. This could also result in the damage or pollution to surrounding areas caused by construction activities.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	4	2	N/A		-
Duration:	2	1			-
Extent:	1	1			-
Irreplaceable:	3	3			-
Reversibility:	3	3			-
Probability:	3	2			-
Total SP:	39	20			-
Significance rating:	L	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure; • The planning for layout must be done in consultation on-site with the Environmental Control Officer (ECO);				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• The Contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; • The Contractor must ensure that all construction personnel, labourers and equipment always remain within the demarcated construction sites; • No servicing of vehicles may be permitted on site, unless for emergency purposes; • Stockpiles may not be situated in such a manner that they obstruct pathways; • Location of storage area must consider prevailing winds, distance to water bodies and general on-site topography; • Place infrastructure as far as possible on sites that have already been transformed; • Facilities may not be used as staff accommodation; • The Contractors camp layout must consider availability of access for deliveries and services and any future works; • The Contractors camp must be of sufficient size to accommodate the needs of all sub-contractors that may work on the project; and, • The Contractor must implement the following as required: o Suitable sanitation facilities, adequate for the number of staff on site (1 for every 15 personnel and 1 for each gender); and, o Facilities for solid waste collection.				
Nature of impact: Topsoil Removal and Soil Erosion.	**Activity:** The clearing of topsoil and excavation for the establishment of building foundations may result in the destruction of fertile topsoil and loss of vegetation cover associated with the development as well as access road.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	4	N/A		-
Duration:	4	4			-
Extent:	1	1			-
Irreplaceable:	3	2			-
Reversibility:	3	2			-
Probability:	5	3			-

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	80	39			-
Significance rating:	MH	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	• Remove topsoil approximately 300 mm deep from establishment area and stockpile areas; • Topsoil stockpiles to be kept free from weeds; • Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rain/storm water; • Topsoil need to be stored on designated areas only. This need to be planned and indicated in the site-layout plan; • Ensure that topsoil is not mixed with subsoil and/or any other excavated material; • Provide containment and settlement facilities for effluents from concrete mixing and washing facilities; • Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan; • Provide spill containment facilities for hazardous materials like fuel and oil; • Topsoil must be used in all rehabilitation activities and may not be compacted to ensure that its plant support capacity remain of high quality; and, • Rehabilitate denude areas especially slopes with appropriate species and erosion protection measures i.e. geotextiles, rocks, topsoil mixtures as per specifications. • Implement suitable erosion prevention measures during the construction phase. • Soil erosion must be controlled as an ongoing management strategy throughout the various phases of the proposed development activities. • Make use of surface erosion control measures within disturbed areas to avoid erosion in times of high risk (e.g. rain season and time of high wind speeds). • Stormwater management along any roadways and paths to reduce gulley erosion formation. • Stormwater management should prevent excessive sediment to be carried into drainage channels and the natural environment. • Removal of debris and other obstructing materials from the site must take place and erosion preventing structures must be constructed. This is done to prevent damming of water and increasing flooding danger.				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• Disturbed areas, that will not form part of the operational footprint but which were disturbed as part of the construction activities, should be rehabilitated and re-vegetated using site-appropriate vegetation and/or seed mixes, to prevent gulley erosion. • Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed. • No materials of any kind are allowed to be stored in the stormwater channels. • Areas around the proposed project footprint, must be adequately rehabilitated to prevent significant erosion. • Avoid the use of concrete lined channels for storm water management as this can increase the speed of water. This in turn increases erosion potential that can cause erosion on site and in watercourse banks and increase siltation downstream. If concrete-lined channels are used; they should end in silt traps. • Soil disturbance must be kept to a minimum within and around the development footprint. • It is recommended to construct a narrow and relatively shallow trench around the base station footprint, filled with gravel. This gravel will slow down any surface run-off from the mast and promote water infiltration and prevent erosion and sedimentation. Alternative measures that will achieve the same outcome can be considered. • All stockpiles must be stored outside of wetland buffers. • Stockpiles must be covered in periods high wind and rain.				
Nature of impact: Surface and groundwater contamination due to construction activities such as the use of hazardous materials on site e.g. fuel and oil.	**Activity:** Spills could possibly occur on site and lead to the contamination of soil and groundwater.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	4	N/A		-
Duration:	2	2			-
Extent:	1	1			-
Irreplaceable:	3	1			-

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Reversibility:	3	2			-
Probability:	4	3			-
Total SP:	60	30			-
Significance rating:	M	L	-	-	-
Cumulative impact:	L	-	-	-	-
Proposed Mitigation:	• Concrete must be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur); • Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; • Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimize the impacts in case of leakage; • All spillage must be cleaned up immediately after they have occurred; • Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bioremediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; • Do not locate any ablution facilities, sanitary convenience, septic tank or French drain within the 1:100-year flood line, or within a horizontal distance of 100 m (whichever is greater) of a watercourse or drainage line; • Vehicles and machinery must be regularly serviced to avoid leakages; • At the work site the Contractor must maintain strict surveillance to ensure that no spills occur; • No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where wastewater can be disposed of correctly; • The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; • Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 110% of the capacity of fuel or chemicals stored within; • Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; • All personnel must receive induction on how to report spillages, contain them and treat them accordingly; • Spill kits must be available at each working station;				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• Drip trays must be placed beneath all construction equipment that are stationary on site or within the site camp; and, • Hazardous waste must be stored in bins with a lid in a demarcated waste area and must be disposed of at a hazardous treatment facility with records on file.				
Nature of impact: Handling of general waste materials on the development site.	**Activity:** The presence of personnel and construction operations on site will increase the likelihood of littering and the dumping of solid waste.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	4	N/A		-
Duration:	2	2			-
Extent:	1	1			-
Irreplaceable:	2	0			-
Reversibility:	1	0			-
Probability:	4	3			-
Total SP:	48	21			-
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• An adequate number of scavenger proof litter bins are to be placed throughout the site. Two (2) waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; • Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect wastepaper, glass and metal waste separately; • Keep all work sites including storage areas, offices and workshops neat and tidy; • Dedicate a demarcated and signposted storage area on site for the collection of construction waste;				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site as mentioned in the Basic Assessment Report; • Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; • The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; • Littering by construction workers shall not be permitted; • General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity; • Minimise waste by sorting wastes into recyclable and non-recyclable waste; • Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; • A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the designated Environmental Site Agent (ESA); • Hazardous waste must be sorted from non-hazardous waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and, • A register must be kept of the quantities of waste disposed and proof of disposal must be available at the site office.				
Nature of impact: Increased risk of veld fires.	**Activity:** Due to the presence of construction personnel in natural areas, fires can occur if not managed to the correct standard. Fire may occur due to the presence and use of hazardous and flammable materials on site.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	8	6	N/A		-
Duration:	2	2			-
Extent:	2	2			-
Irreplaceable:	4	2			-
Reversibility:	4	3			-
Probability:	4	2			-

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	80	30			-
Significance rating:	MH	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• The Contractor shall take all reasonable and precautionary steps to ensure that fires are not started as a consequence of the activities on site; • Ensure the work site and the contractor's camp is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veldt areas, and at least one fire extinguisher of the appropriate type irrespective of the site; • Workers must be adequately trained in the handling of firefighting equipment, and can include but not limited to: o Regular fire prevention talks and drills; and, o Posting of regular reminders to staff; • No open fires are permitted anywhere on site; • Do not store any fuel or chemicals under trees; • Do not store gas and liquid fuel in the same storage area (Hazardous substances to be stored in accordance with SANS); • Any fires that occur on site shall be reported to the ECO immediately and then to the relevant Authorities; • In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control; • Do not permit any smoking within 3 m of any fuel or chemical storage area, or refuelling area. A designated smoking area must be established on site; and, • All construction vehicles must be fitted with at least one fire extinguisher.				N/A
Nature of impact: Traffic impacts associated with the movement of construction vehicles on site.	**Activity:** The movement of vehicles on site may result in the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	8	4	N/A		-
Duration:	2	2			-

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Extent:	1	1			-
Irreplaceable:	3	2			-
Reversibility:	3	3			-
Probability:	4	3			-
Total SP:	68	36			-
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas; • Monitor the establishment of (Alien) Invasive Species and remove as soon as detected, before regenerative material can be formed; • Abnormal loads and machinery should avoid movement over gravel roads during and immediately after rainfall events, to limit destruction of road surfaces and sedimentation of downhill rivers/streams; • All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to the licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so; • Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads; • Signage is always to be placed on vehicles; • Any damage to public roads is to be reported to the management authority and repaired to its original condition; • All construction vehicles must adhere to construction sites and avoid off road to minimise impact on vegetation and soil; • After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; and, • Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear.				N/A
Nature of impact:	**Activity:**				No construction phase impacts are associated with the no-go

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Traffic impacts associated with the movement of construction vehicle.	The movement of vehicles in the vicinity of the construction site may cause damage to road surfaces as well as increase in the traffic volume of Route (R504).				alternative thus no assessment has been undertaken.
Magnitude:	4	2	N/A		-
Duration:	2	2			-
Extent:	3	3			-
Irreplaceable:	2	1			-
Reversibility:	4	3			-
Probability:	2	1			-
Total SP:	30	11			-
Significance rating:	L	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	• Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods; • Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces; • Any damage to public roads is to be reported to the management Authority and repaired to its original condition; • Transport of materials should be limited to the least number of trips possible; and, • Abnormal loads may not be transported after dark.				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON BIOLOGICAL ASPECTS:					
Nature of impact: Direct impact on vegetation during construction and loss of species.	**Activity:** The construction of several permanent structures on site will result in the loss of vegetation due to foundation excavation.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	4	N/A		-
Duration:	2	2			-
Extent:	1	1			-
Irreplaceable:	1	1			-
Reversibility:	2	1			-
Probability:	4	3			-
Total SP:	48	27			-
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• No open fires are allowed on site during operation activities. • Sufficient fire management equipment must be on the site. • Smoking must be restricted to designated smoking areas. • No dumping of sewage or hazardous waste into a terrestrial ecosystem. • All activities must remain within the designated footprint. • All areas outside of the footprint must be considered no-go areas. • Development and access roads should be restricted to already disturbed areas as far as practically possible. • Vehicles use must be restricted to designated roads.				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• All staff must be trained to ensure that they are aware of any potential fauna may be on the footprint or surrounds. • Vehicles must remain within a 30 km/h speed limit to avoid roadkill incidents. • Any indigenous vegetation removed from the footprint should be scattered in adjacent area of recovering natural vegetation, to preserve potential microfauna and invertebrates found in amongst the vegetation.				
Nature of impact: Dust nuisance generated by the operation of machinery and vehicles.	**Activity:** The construction activities of the proposed project could potentially result in fugitive dust emissions due to vegetation removal where dust could spread into the surrounding areas. The significance of this potential impact will likely; however, be only temporary.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	4	2	N/A		-
Duration:	2	2			-
Extent:	1	1			-
Irreplaceable:	1	1			-
Reversibility:	3	2			-
Probability:	4	3			-
Total SP:	44	24			-
Significance rating:	M	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	• Implement suitable dust management and prevention measures during the construction phase; • Ensure all vehicles remain on designated roads and avoid the opening of detour or by-pass tracks; • Vehicles delivering or removing soil must be covered to reduce spills and windblown dust; • Any complaints received by the Contractor regarding dust will be recorded and communicated to the ECO; and, • Areas around the proposed project footprint must be adequately rehabilitated to prevent significant dust emissions.				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Nature of impact: Fauna and Flora will be directly impacted as a result of construction activities and human presence at the site.	**Activity:** The construction of facilities will result in some habitat loss for resident fauna, as some species will occur within the affected areas. In addition, increased levels of noise, pollution, disturbance and human presence during construction will be detrimental to resident fauna. Sensitive and shy fauna may move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species (such as mole rats or blind snakes) would not be able to avoid the construction activities and might be killed.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	4	N/A		-
Duration:	2	2			-
Extent:	1	1			-
Irreplaceable:	3	2			-
Reversibility:	3	2			-
Probability:	4	3			-
Total SP:	60	33			-
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• No hunting, snaring, shooting, nest raiding or egg collection by the construction staff may be allowed; • Holes and trenches must not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days should have places where the loose material has been returned to the trench to form an escape ramp present at regular intervals to allow any fauna that fall in to escape; • Construction workers should be educated on sensitive species likely to be found in the area and posters should be put up of species of conservation concern. If any of these species are found during construction, they will be advised to contact the ECO immediately in order to prevent harm to these species and their habitats; • Keep the facility neat, tidy and clean in order not to attract scavenging animals such as rats and mice;				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• Ensure that the construction area is fenced off from adjacent areas which may harbour wild animals; • Do not store building materials and excess stockpiled soils within riparian zones or within areas where natural vegetation occurs; and, • Should any faunal species need to be translocated, a faunal or avifaunal (in the case of birds) will need to be consulted. • All personnel, during all phases of the project, must be inducted to ensure that they are aware of the environmental sensitivities on the site. • No fauna may be caught, trapped or harmed in any way. • Clearance of vegetation should take place in phases (where practically possible), to increase the chances of smaller faunal species potential occurring in the development footprint, moving into the adjacent area.				
Nature of impact: Spread and establishment of Alien and Invasive Species.	**Activity:** Soil disturbances from construction will enhance the encroachment of Alien and Invasive vegetation that will out compete indigenous counterpart species for resources, displace and reduce faunal and flora biodiversity. Clearing current Invasive Alien species will increase the risk of spreading species if not properly removed and safety transported.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	2	N/A		-
Duration:	3	3			-
Extent:	2	1			-
Irreplaceable:	2	1			-
Reversibility:	3	2			-
Probability:	4	3			-
Total SP:	64	27			-
Significance rating:	M	L	-	-	-
Cumulative impact:	L	-	-	-	-

<table>
<tr><th rowspan="2">Planning, design and construction phase</th><th colspan="2">Layout Alternative 1 (Preferred Layout)</th><th colspan="2">Layout Alternative 2</th><th rowspan="2">No-Go Alternative</th></tr>
<tr><th>Before Mitigation</th><th>After Mitigation</th><th>Before Mitigation</th><th>After Mitigation</th></tr>
<tr><td>Proposed Mitigation:</td><td colspan="4">• Alien plant material removed during construction and eradication efforts should be contained and disposed of properly to limit accidental spread;
• Construction activities must be limited to the smallest possible area;
• Designated authorised service roads must be used by all Construction Vehicles; and,
• Alien Invasive Species (AIS) proliferation, which may affect adjacent natural habitat within surrounding areas, needs to be strictly managed adjacent to the footprint area.
• Ongoing AIS monitoring and eradication should take place throughout the operational phase of the expansion, and the footprint perimeters should be regularly checked during the operational phase for AIS proliferation to prevent spread into surrounding natural areas.
• Construction activities should be limited to the smallest possible area.
• Construction vehicles should use existing authorised service roads.
• Implement suitable alien invasive species establishment prevention measures during the construction phase such as proper storage, transport and disposal of plant material and minimising disturbance to the areas surrounding the development footprint.
• Alien invasive vegetation material cleared during construction activities must be adequately contained and disposed of at a suitable, certified ‘green waste’ disposal site to prevent further spreading.
• Areas around the proposed project footprint must be adequately rehabilitated to prevent significant alien invasive species establishment.
• Herbicides must be used in the prescribed quantities and only periods of no rainfall.</td><td>N/A</td></tr>
<tr><td>Nature of impact:

Water quality of run-off water.</td><td colspan="4">Activity:
The Wetland and Harts River can potentially be at risk to increased surface runoff due to change in surface texture and effluent from the proposed development.</td><td>No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.</td></tr>
<tr><td>Magnitude:</td><td>6</td><td>4</td><td colspan="2" rowspan="4">N/A</td><td>-</td></tr>
<tr><td>Duration:</td><td>2</td><td>2</td><td>-</td></tr>
<tr><td>Extent:</td><td>1</td><td>1</td><td>-</td></tr>
<tr><td>Irreplaceable:</td><td>3</td><td>1</td><td>-</td></tr>
</table>

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Reversibility:	3	2			-
Probability:	4	3			-
Total SP:	60	30			-
Significance rating:	M	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	• All rubble and litter should be cleared from the site and stored in designated waste bins and/or stockpile areas respectively. • Strict waste management should be implemented during construction. • Sufficient waste receptacles should be placed around the facility to encourage people to use them. • The principle of reduce, re-use and recycle should be followed. • Construction site should be kept clean and tidy. • Any waste should be disposed in a registered landfill and not be allowed to be dumped in the surrounding landscape. • No dumping of waste or any other materials is allowed within any stormwater channels, drainage lines or the watercourses. • Storage of material, waste, spoil and construction equipment on or in stormwater drainage or inside of demarcated protected areas – is strictly prohibited. • All surfaces used for waste storage should have an impermeable surface. • Drip trays to be placed beneath stationary vehicles and generators. • Machinery should be maintained and inspected for leaks. All hazardous chemicals should be handled and stored on impermeable surfaces. • Hazardous chemicals should be kept on an impermeable bund area. • Stormwater and run-off should be managed and diverted to not be in contact with waste. • Regularly inspect all construction vehicles for leaks. Re-fuelling of vehicles must take place on a sealed surface area surrounded by berms to prevent ingress of hydrocarbons into topsoil. • If any spills occur, they should be immediately cleaned up. • An emergency response plan should be available for any chemical spill or ecological damage. • Spill kits and material safety data sheets must be stored on site: In case of accidental spills of oil, petroleum products etc., good oil absorbent materials must be on hand to allow for the quick remediation of the spill. The kits should also be well				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	marked and all personnel should be educated to deal with the spill. Vehicles must be kept in good working order and leaks must be fixed immediately on an oil absorbent mat. The use of a product such as Sunsorb is advised. • Proper toilet facilities must be available during constructional. Chemical toilets must be provided which should always be well serviced and spaced as per occupational health and safety laws and placed outside the 1:100 year flood lines. • No dirty water runoff from the construction and decommissioning site must be permitted to reach the watercourses around the proposed site. • Construction activities should be limited to the smallest possible area. • Construction vehicles should use existing roads. • Personnel must remain outside of delineated watercourses; where feasible. • Method Statements must be compiled for the following activities: o Handing of general waste o Handling of hazardous waste o Trenching within watercourses • All proposed trenches within watercourses and within 100 m of watercourse, must be excavated by hand. • A rehabilitation method statement must be compiled to rehabilitate the portion of stream that will be trenched. • An effective stormwater management plan must be compiled to ensure effective stormwater drainage. • The development footprint must remain as small as practically possible. • All buffers as stated in the Aquatic Compliance Statement must be adhered to. • All bare areas must be rehabilitated via a Revegetation Method Statement				

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:					
Nature of impact: Occupational Health and Safety.	**Activity:**				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	During the construction phase, accidents, occupational diseases, ill health and damage to property can occur if pre-cautionary measures are not taken. Increased movement of vehicles may lead to increased accidents among local communities, construction workers and vehicle operators.				
Magnitude:	10	6	N/A		-
Duration:	2	2			-
Extent:	2	2			-
Irreplaceable:	4	4			-
Reversibility:	4	4			-
Probability:	4	3			-
Total SP:	88	54			-
Significance rating:	MH	M	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Ensure that PPE is available to Personnel; • Adhere to the Occupational Health and Safety Act; • Keep the first aid kit stocked; • Issue all workers with necessary health and safety items; • Potentially hazardous areas must be demarcated with danger tape; • Appropriate signage must be placed to caution Employees and contractors not to enter certain structures without Authorisation; • Regular safety inspections must be conducted to ensure that participants are equipped with necessary safety equipment; and, • All construction personnel to wear hard hats and reflector jackets at all times.				N/A
Nature of impact:	**Activity:**				The proposed development will not take place and as such no socio-

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Construction activities may have a positive impact on the local and regional socio-economic conditions.	During the construction phase of the project the construction process may have a positive impact on the local and regional socio-economic conditions by means of employment creation.				economic benefits will be derived from this construction period. The impact will thus be a negative one.
Magnitude:	6	N/A	N/A		4
Duration:	2				2
Extent:	2				2
Irreplaceable:	0				0
Reversibility:	0				3
Probability:	4				1
Total SP:	40				11
Significance rating:	L+	-	-	-	L
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Where reasonable and practical the contractors appointed by the proponent should appoint local contractors and implement a "Local First" policy, especially for semi and low-skilled job categories; • Where feasible, efforts should be made to employ Local Contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria; • Trench bedding material (sand) should be sought locally; • Prior to construction phase the proponent and its Contractors should meet with representatives' from the Local Municipality to establish the existence of a skills database for the area. If such a database exists it should be made available to the Contractors appointed for the construction phase; and, • The recruitment selection process should seek to promote gender equality and the employment of women where possible, particularly for less labour-intensive work such as supervision.				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON CULTURAL-HISTORICAL ASPECTS:					
Nature of impact: Damage and destruction of vertebrate fossils during excavation activities.	**Activity:** Excavation activities can result in the discovery of cultural and historical artefacts beneath the earth surface. Damage or loss can occur if the correct procedures are not followed.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	2	0	N/A		-
Duration:	2	2			-
Extent:	1	1			-
Irreplaceable:	2	2			-
Reversibility:	4	4			-
Probability:	2	1			-
Total SP:	22	9			-
Significance rating:	L	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained Palaeontologist or Heritage Specialist must be notified to assess the finds, and this must then be reported to the South African National Resources Agency; • Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the Heritage Authority. A registered Heritage Specialist must be called to the site for inspection and removal once authority to do so, has been given;				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	

	• Excavations must be limited to the footprint area and be maintained in a narrow corridor;
	• All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures must be followed:
	  ○ All construction in the immediate 50 m vicinity radius of the site must cease;
	  ○ The Heritage Practitioner must be informed as soon as possible;
	  ○ In the event of obvious human remains SAPS must be notified;
	  ○ Mitigation measures (such as refilling, etc.) must not be attempted;
	  ○ The area in a 50 m radius of the find must be cordoned off with hazard tape; and,
	• Public access must be limited, and the area must be placed under guard.				

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL VISUAL IMPACTS:					
Nature of impact: Impact on the sense of place for surrounding users.	**Activity:** The movement of construction vehicles, machinery and personnel on site shall result in a visual impact on surrounding users. Furthermore, to this, the storage of materials and excavation shall result in disturbance and an unsightly character.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	4	2	N/A		-
Duration:	2	2			-
Extent:	2	1			-
Irreplaceable:	2	2			-
Reversibility:	1	1			-
Probability:	5	3			-

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Total SP:	55	24			-
Significance rating:	M	L	-	-	-
Cumulative impact:	L	-	-	-	-
Proposed Mitigation:	• Access roads are to be kept clean and dust suppression techniques should be implemented to minimise impacts of vehicle movement; • Site offices and structures should be limited to one location and carefully situated to reduce visual intrusions. • Construction camps as well as development areas must be screened with netting; • Lights within the construction camp must face directly down (angle of 180˚); • Minimum vegetation may be removed to ensure the visual absorption capacity remain high; • Litter should be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and, • Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare.				N/A

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON NOISE ASPECTS:					
Nature of impact: Noise nuisance generated by construction works, vehicles and personnel.	**Activity:** The operating of vehicles and machinery on site results in the generation of noise disturbing users of the surrounding area.				No construction phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	8	4	N/A		-
Duration:	2	2			-
Extent:	2	1			-

Planning, design and construction phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Irreplaceable:	2	2			-
Reversibility:	1	1			-
Probability:	5	4			-
Total SP:	75	40			-
Significance rating:	MH	L	-	-	-
Cumulative impact:	L	-	-	-	-
Proposed Mitigation:	• Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of these at the same time; • Fit machinery with silencers; • All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens or sheds where possible; • The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally; • Vehicles must avoid the use of their reverse gear as far as possible to avoid the sounding of sirens. This must not be considered for temporary access routes as disturbance of adjacent vegetation is to be avoided; • Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods; • Unless otherwise specified by the DEO, normal working hours will apply (i.e. from 07H00–18H00, Mondays to Fridays); • No loud music is permitted on site or in the Camp; • Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, • Vehicles are to abide by speed restrictions on access roads and limit trip generation to minimise disturbance to surrounding land users.				N/A

2. POTENTIAL IMPACTS DURING THE OPERATIONAL PHASE:

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON GEOGRAPHICAL, GEOLOGICAL AND PHYSICAL ASPECTS:					
Nature of impact: Handling of general waste materials on the development site.	**Activity:** Waste will be generated on site, if not disposed of correctly it will become a nuisance within the area.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	2	N/A		-
Duration:	4	4			-
Extent:	2	1			-
Irreplaceable:	2	1			-
Reversibility:	1	1			-
Probability:	4	3			-
Total SP:	60	27			-
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Waste must not be stored on site in excess of ninety (90) days; • All general waste must be disposed of at a registered landfill site as mentioned in the Basic Assessment Report; • An adequate number of scavenger proof litter bins are to be placed throughout the site. Two (2) waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited;				N/A

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect wastepaper, glass and metal waste separately; • Keep all work sites including storage areas, offices and workshops neat and tidy; • Dedicate a demarcated and signposted storage area on site for the collection of waste; • All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site as mentioned in the Basic Assessment Report; • Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; • The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; • Littering by personnel shall not be permitted; • General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity; • Minimise waste by sorting wastes into recyclable and non-recyclable waste; • Hazardous waste must be sorted from non-hazardous waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and, • A register must be kept of the quantities of waste disposed and proof of disposal must be available at the site office.				
Nature of impact: Traffic impacts associated with the movement of vehicles within the area.	**Activity:** The regular movement of vehicles on the R504 and within the area would increase traffic flow and impede vehicle movement.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	3	2	N/A		-
Duration:	3	3			-
Extent:	3	2			-
Irreplaceable:	1	1			-
Reversibility:	1	1			-

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Probability:	2	1			-
Total SP:	22	9			-
Significance rating:	L	L	-	-	-
Cumulative impact:	L	L	-	-	-
Proposed Mitigation:	• All speed limits need to be adhered to; • Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods; • Any damage to public roads is to be reported to the management Authority and repaired to its original condition; and, • Abnormal loads may not be transported after dark.				N/A
Nature of impact: Infiltration of effluent and chemicals that have the potential to change the quality of the groundwater. Discharge of treated effluent into the Harts River.	**Activity:** Potential of leachate from the sewage treatment plant to pollute the groundwater by changing the quality of the groundwater. Discharge of treated effluent which do not comply to DWS standards can cause detrimental effects on both the ecological/watercourse and human health.				The pollution of groundwater can cause the proposed oxidation pond's environmental authorisation and associated licenses to be reviewed with associated penalties.
Magnitude:	10	6	N/A		-
Duration:	5	4			-
Extent:	2	2			-
Irreplaceable:	4	3			-
Reversibility:	4	3			-

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Probability:	4	4			-
Total SP:	100	72			-
Significance rating:	H	M	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Groundwater monitoring to prevent groundwater contamination, through means of prevention when detected early enough. • The facility should be kept clean and tidy at all times. • Any waste generated should be disposed of accordingly in registered waste (landfill) sites and not dumped on site or the surrounding area. • All surfaces that are associated with waste should have impermeable surfaces. • Stormwater and runoff should be diverted and managed to not come in contact with any waste generated on site • Operation of the plant should be managed to prevent overflow and spillage • Integrity of pipes and associated infrastructure should be inspected and upgraded as needed. • All spills must immediately be cleaned up and disposed of at a registered landfill site. • The effluent water which will be treated from the oxidation pond should be tested regularly to ensure that it complies to SANS standards as recommended by DWS prior to being discharged into the receiving watercourse. The surface water quality downstream and upstream of the proposed oxidation pond should be monitored on a monthly basis by a qualified Hydrogeological Specialist to ensure that contamination does not occur from the proposed activity. • At least two (2) monitoring boreholes, one (1) upstream from the facility and the other downstream of the facility, should be drilled on site to ensure that leakage from the treatment plant does not occur which will aid as an early detection tool; and, • The groundwater quality should be assessed bi-annually by an accredited laboratory and distributed to the relevant authority on compliance during the operation of the facility.				N/A
Nature of impact: Infiltration of effluent and chemicals that have the potential to change the quality of the groundwater.	**Activity:** Taking into account the site-specific properties such as: • Recharge (low); • Rainfall (low rainfall MAP: 426 mm); • Temperature (high annual temperature of 17.90 °C – High evaporation); • Topography and drainage (drainage towards topographical depression – Harts River, however will rather evaporate than run-off); • Water table (water table of 15.35 mbgl.);				The pollution of groundwater can cause the proposed oxidation pond's environmental authorisation and associated licenses to be reviewed with associated penalties.

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
	• Minor fractured, weathered aquifer (high permeability); • Groundwater vulnerability (very low - low), and, • Groundwater quality (good drinking water quality (EC Values) – high salinity).				
Magnitude:	4	4	N/A		
Duration:	4	3			
Extent:	2	2			
Irreplaceable:	2	2			
Reversibility:	2	2			
Probability:	2	1			
Total SP:	28	13			
Significance rating:	L	L	-	-	
Cumulative impact:	-	-	-	-	
Proposed Mitigation:	• Groundwater monitoring to prevent groundwater contamination, through means of prevention when detected early enough. • The facility should be kept clean and tidy at all times. • Any waste generated should be disposed of accordingly in registered waste (landfill) sites and not dumped on site or the surrounding area. • All surfaces that are associated with waste should have impermeable surfaces. • Operation of the plant should be managed to prevent overflow and spillage. • Integrity of pipes and associated infrastructure should be inspected and upgraded as needed.				N/A
Nature of impact: Increased risk of veld fires.	**Activity:** Due to the presence of personnel in natural areas, fires can occur if not managed to the correct standard.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Magnitude:	10	6	N/A		
Duration:	4	2			
Extent:	2	2			
Irreplaceable:	4	3			
Reversibility:	4	3			
Probability:	3	2			
Total SP:	72	32			
Significance rating:	M	L	-	-	
Cumulative impact:	-	-	-	-	

Proposed Mitigation:	• The Applicant shall take all reasonable and precautionary steps to ensure that fires are not started due to the activities on site;
	• Ensure the work site is equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veldt areas, and at least one fire extinguisher of the appropriate type irrespective of the site;
	• Workers must be adequately trained in the handling of firefighting equipment, and can include but not limited to:
	  ○ Regular fire prevention talks and drills; and,
	  ○ Posting of regular reminders to staff;
	• No open fires are permitted anywhere on site;
	• Do not store any fuel or chemicals under trees;
	• Do not store gas and liquid fuel in the same storage area (Hazardous substances to be stored in accordance with SANS);
	• Any fires that occur on site shall be reported to the ECO immediately and then to the relevant Authorities;
	• In the event of a fire, the Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring it under control;
	• Do not permit any smoking within 3m of any fuel or chemical storage area, or refuelling area. A designated smoking area must be established on site; and,
	• All construction vehicles must be fitted with at least one fire extinguisher.
					N/A

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Nature of impact: Water quality changes due to operations of the oxidation ponds	**Activity:** The general operation of the oxidation ponds and pipelines may result in seepage of untreated sewage and effluent into surrounding freshwater systems				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	4	N/A		-
Duration:	4	3			-
Extent:	2	2			-
Irreplaceable:	4	3			-
Reversibility:	4	3			-
Probability:	3	2			-
Total SP:	60	30			-
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• An effective maintenance plan must be compiled and approved by the Department of Water and Sanitation (DWS). • Any spillage or seepage incidents must be immediately reported. These reports must be submitted to the DEDECT and DWS. • Regular effluent monitoring must take place to ensure that the treatment system is effective.				N/A
Nature of impact: General operation of oxidation ponds	**Activity:** The general operation of the oxidation ponds may result in improper stormwater management and alien invasive species establishment				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	6	4	N/A		-

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
Duration:	4	3			-
Extent:	2	2			-
Irreplaceable:	4	3			-
Reversibility:	4	3			-
Probability:	3	2			-
Total SP:	60	30			-
Significance rating:	M	L	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Structures must be inspected regularly for the accumulation of debris, blockages, instabilities and erosion with concomitant remedial and maintenance actions. • Regular inspections will be undertaken of any access roads and stormwater management drains for signs of erosion and sedimentation. • Ongoing alien vegetation removal should take in and around the development footprint. • Upstream runoff should be diverted around the mast. • Operational site should be kept clean and tidy. • Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the proposed development activities. • No dumping of waste or any other materials is allowed within the watercourses or their regulated areas. • If any spills occur, they should be immediately cleaned up.				N/A

Operational Phase	Layout Alternative 1 (Preferred Layout)		Layout Alternative 2		No-Go Alternative
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation	
POTENTIAL IMPACTS ON SOCIO-ECONOMIC ASPECTS:					
Nature of impact: Oxidation Pond System.	**Activity:** The construction of the Oxidation Pond and two gravity outfall sewer lines will treat wastewater and reduce the discharge of contaminants and pathogens into the environment.				No operational phase impacts are associated with the no-go alternative thus no assessment has been undertaken.
Magnitude:	10	-	N/A		-
Duration:	4	-			-
Extent:	2	-			-
Irreplaceable:	0	-			-
Reversibility:	0	-			-
Probability:	5	-			-
Total SP:	80	-			-
Significance rating:	MH (+)	-	-	-	-
Cumulative impact:	-	-	-	-	-
Proposed Mitigation:	• Mitigation measures are not applicable as the impact is positive.				N/A

3. POTENTIAL IMPACTS DURING THE DECOMISSIONING PHASE

The activity will not be decommissioned in the future and therefore the proposed impacts thereof were not assessed.