

## **APPENDIX B - IMPACT TABLES**

**PLANNING AND DESIGN PHASE**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
<b>ENVIRONMENTAL POLICY</b>														
Legal and policy compliance	All Alternatives	During the planning and design phase, failure to adhere to existing policies and legal obligations and obtain the necessary authorisations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	Negative	Direct	Severe	National	Long-term	Possible	Reversible	Resource will not be lost	Achievable	<b>HIGH -</b>	<ul style="list-style-type: none"> <li>All relevant legislation and policy must be consulted, and the proponent must ensure that the project is compliant with such legislation and policy.</li> <li>These should include (but are not restricted to): NEMA and Local Municipal bylaws.</li> <li>All relevant permits and authorisations including Water Use Licenses or General Authorisations, Building Plan Approvals and plant removal permits must be in place prior to commencement of construction.</li> </ul>	<b>LOW -</b>
<b>BUILT ENVIRONMENT</b>														
Infrastructure	All Alternatives	During the planning and design phase, planning and placement of structures and associated infrastructure in sensitive areas could lead to the damage and degradation of natural areas as well as to the structures themselves.	Negative	Direct	Moderate	Study area	Medium-term	Possible	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>Planning for and placement of infrastructure must be done so as to avoid sensitive areas as far as possible.</li> </ul>	<b>LOW -</b>

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Stormwater management	All Alternatives	During the planning and design phase, inadequate planning for stormwater during the construction and operational phases within the site could result in erosion and contamination of the soil and surrounding watercourses if there are not appropriate stormwater management structures in place.	Negative	Direct, Cumulative	Moderate	Study area	Medium-term	Possible	Reversible	Resource will be partly lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>A method statement must be developed by the project manager or contractor prior to construction, including considerations for stormwater, erosion, waste and alien vegetation management, as well as site rehabilitation and maintenance considerations. This method statement must be approved by the appointed ECO.</li> <li>This method statement must include stormwater management considerations to control runoff prevent erosion of the site and its surroundings and mitigate the unnecessary loss of soil and sedimentation of watercourses during all phases of the project.</li> <li>Regular monitoring of implementation of this method statement for the rehabilitation of disturbed areas must be conducted.</li> <li>Appropriate stormwater structures, in alignment with the method statement, must be designed to minimize erosion of the surrounding environment to the extent required</li> </ul>	<b>LOW -</b>

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Waste management	All Alternatives	During the planning and design phase, failure to plan for the storage, handling and disposal of general and hazardous waste during the construction and operation phase may lead to littering and pollution of the surrounding environment, unsanitary conditions and health risks.	Negative	Direct, Indirect	Moderate	Study area	Medium-term	Possible	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>A method statement must be developed by the project manager or contractor prior to construction, including considerations for stormwater, erosion, waste and alien vegetation management, as well as site rehabilitation and maintenance considerations. This method statement must be approved by the appointed ECO.</li> <li>This method statement must include waste management considerations for handling onsite general and hazardous waste during the construction and operation phases must be developed and implemented during construction.</li> <li>An appropriate area must be identified where waste can be stored before disposal.</li> <li>All hazardous substances such as paints, diesel and cement must be stored in a secure bunded area with an impermeable surface beneath them.</li> </ul>	<b>LOW -</b>
<b>SOCIO-ECONOMIC</b>														
Job creation	All Alternatives	During the planning and design phase, there will be some temporary job opportunities associated with planning and design of the proposed installation of the proposed SANRAL FMS/ITS.	Positive	Direct	Slight	Localised	Short-term	Definite	N/A	Resource will not be lost	Easily Achievable	<b>HIGH +</b>	N/A	<b>HIGH +</b>
Health and safety	All Alternatives	During the planning and design phase, failure to plan for potential health and safety risks during the construction and operation phase may result in the harm of labourers, staff, surrounding landowners and the public.	Negative	Direct, Indirect	Moderate	Study area	Short-term	Possible	Irreversible	Resource will be lost	Achievable	<b>MODERATE -</b>	A health and safety plan in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) must be drawn up by and HSE officer prior to construction to ensure workers safety.	<b>LOW -</b>

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
On-site fire risk	All Alternatives	During the planning and design phase, failure to plan for accidental fires during the construction and operation phase could result in potential harm to the public and/or surrounding landowners and their property.	Negative	Direct	Moderate	Study area	Medium-term	Possible	Irreversible	Resource will be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>Emergency preparedness must be in place for both the construction and operational phases and before these phases commence. This should form part of the method statement.</li> <li>SANRAL SOC must plan for and put measures in place to prevent and deal with fires including the provision of firefighting equipment.</li> </ul>	<b>LOW -</b>
Traffic	All Alternatives	During the planning and design phase, inadequate planning for the transportation of mast materials and specialist construction equipment to the site could cause traffic congestion.	Negative	Direct	Moderate	Regional	Short-term	Possible	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>Consultation with the local Road Traffic Unit should be done early in the planning phase and if deemed necessary, road traffic permits should be obtained for transporting parts, containers, materials and construction equipment to the site to the extent required.</li> <li>Provision must be made for traffic accommodation where construction activities impact on existing roads.</li> </ul>	<b>LOW -</b>
<b>REHABILITATION AND MAINTENANCE</b>														
Inadequate rehabilitation and maintenance	All Alternatives	During the planning and design phase, inadequate planning for rehabilitation and maintenance of infrastructure could lead to degradation of the study area and surrounding areas.	Negative	Direct, Indirect	Moderate	Study area	Medium-term	Possible	Reversible	Resource will be partly lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>A rehabilitation plan must be developed by the project manager or contractor as part of the method statement and implemented during construction and operation phases. This method statement must be approved by the appointed ECO.</li> </ul>	<b>LOW -</b>
<b>TERRESTRIAL BIODIVERSITY AND ECOLOGY</b>														
Loss of Vegetation Communities	Preferred Alternative	The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems.	Negative	Direct	Moderate	Study area	Permanent	Probable	Reversible	Resource will be partly lost	Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>All access to the proposed development must be limited to existing access roads and pathways. No ad hoc roadways must be permitted, without first being authorised by the ECO and the CA.</li> </ul>	<b>LOW -</b>

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Loss of Plant Species of Conservation Concern (SCC)	Preferred Alternative	During the field assessment no protected plant species were recorded within the development footprint.	Negative	Direct	Moderate	Study Area	Permanent	May occur	Reversible	Resource will be partly lost	Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>If any protected plant species are found within the construction footprint, permits must be received before construction commences on site.</li> <li>No plant species (SCC or common) must be harvested or removed from site without approval from the ECO or Applicant in writing.</li> <li>If any protected species die during the translocation process, specimen loss must be offset at a ratio of 1:3.</li> </ul>	<b>LOW -</b>
Fragmentation, Loss of Ecosystem Function and Edge Effects	Preferred Alternative	The project will result in the permanent habitat loss within the footprints of the proposed SANRAL FMS/ITS.	Negative	Direct	Slight	Study area	Permanent	Definite	Reversible	Resource will be partly lost	Achievable	<b>MODERATE -</b>	Mitigation Measures: <ul style="list-style-type: none"> <li>The proposed development footprint must be kept as small as possible and ensure that all non- operational areas are rehabilitate to a suitable condition.</li> <li>Rehabilitation must extend into the PAOI and not only the proposed development footprint.</li> </ul>	<b>LOW -</b>
		Portions of faunal habitat have already been lost due to existing buildings, roads and bare open ground and trampled field which have little to no surface roughness.	Negative	Cumulative	Slight	Study area	Long term	Definite	It is difficult to implement mitigation measures specific to the cumulative impacts as the applicant only has jurisdiction over their development and not over other developments or activities in the area. However, it is imperative that the applicant implement the mitigation measures listed above for the direct impacts.	<b>MODERATE -</b>	<b>LOW -</b>			

**CONSTRUCTION PHASE**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
<b>ENVIRONMENTAL POLICY</b>														
Legal and policy compliance	All Alternatives	During the construction phase, failure to adhere to existing policies and legal obligations and obtain the necessary authorisations could lead to the project conflicting with local, provincial and national policies, legislation, etc. This could result in lack of institutional support for the project, overall project failure and undue disturbance to the natural environment.	Negative	Direct	Severe	National	Long-term	Possible	Reversible	Resource will be partly lost	Achievable	<b>HIGH -</b>	<ul style="list-style-type: none"> <li>All construction related conditions in the Environmental Authorisation, EMPr and other permits must be adhered to.</li> <li>SANRAL SOC must employ an independent Environmental Control Officer (ECO) for the construction phase to ensure that construction is implemented according to specifications in the EA and EMPr.</li> <li>Copies of all applicable licenses, permits and managements plans (EA, EMPr, etc.) must be available on-site at all times.</li> <li>Environmental Awareness Training must be included in site meetings/talks with all workers.</li> </ul>	<b>LOW -</b>
<b>BUILT ENVIRONMENT</b>														
Infrastructure	All Alternatives	During the construction phase, the disturbance/clearing of vegetation and construction activities within or within close proximity to sensitive areas may result in degradation of the surrounding environment.	Negative	Direct, Indirect	Severe	Study area	Long-term	Definite	Reversible	Resource will be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>Vegetation clearance must be limited to the area within the footprint of the designated area.</li> <li>Vegetation disturbance outside of the development footprint must be minimized.</li> </ul>	<b>LOW -</b>
Stormwater management	All Alternatives	During the construction phase, failure to implement effective stormwater management measures may result in increased surface soil erosion and contamination of stormwater and resulting surrounding watercourses.	Negative	Direct, Indirect	Moderate	Study area	Long-term	Possible	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>The construction site must be managed in a manner that prevents pollution to downstream watercourses or groundwater, due to suspended solids, silt or chemical pollutants.</li> <li>Berms and swaths must be placed in areas that may be prone to erosion.</li> <li>Temporary cut-off drains and berms may be required to capture storm water and promote infiltration.</li> </ul>	<b>LOW -</b>

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Waste management	All Alternatives	During the construction phase, poor management of handling, disposal and storage of general and hazardous waste may lead to the pollution of the surrounding environment.	Negative	Direct, Indirect	Moderate	Study area	Medium-term	Possible	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>All general waste must be disposed of in bins/waste skips labelled "general waste".</li> <li>Sufficient waste bins must be provided throughout the construction site for collecting waste.</li> <li>All general waste collected on site must be disposed of at a licensed general waste disposal site.</li> <li>All hazardous waste generated on site must be placed in a temporary impermeable bunded containment area which must be disposed of at a hazardous landfill site or be collected by the appropriate service provider.</li> <li>Proof of receipt of hazardous waste by a licensed service provider must be maintained on the site.</li> <li>Adequate sanitary facilities must be provided for construction workers and they must be properly secured to the ground.</li> <li>Maintenance of the chemical toilets should be done on a regular basis to prevent any leakages.</li> </ul>	<b>LOW -</b>
		During the construction phase, the mixing of cement on site could result in ground water contamination from compounds in the cement. In addition, a large number of cement mixing stations on site could increase the presence of impermeable areas which in turn could increase rates of run-off and thereby increase the risk of localized flooding, soil erosion, silting, gully formation, etc.	Negative	Direct, Indirect	Moderate	Study area	Medium-term	Possible	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>Concrete and cement mixing must take place on an impermeable surface, and dried waste concrete and cement must be disposed of with building rubble.</li> <li>No concrete mixing must take place within 32 m of any watercourse.</li> </ul>	<b>LOW -</b>
<b>SOCIO-ECONOMIC</b>														
Capital economic investment	All Alternatives	The installation of the proposed SANRAL FMS/ITS entails a capital investment in excess of R1 billion, which will benefit the local and national economy in the form of materials production and sales as well as the use of local SMMEs.	Positive	Direct	Slight	Localised	Short-term	Definite	N/A	Resource will not be lost	Easily Achievable	<b>VERY HIGH +</b>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<b>VERY HIGH +</b>



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Job creation	All Alternatives	During the construction phase, there will be some temporary job opportunities associated with installation of the proposed SANRAL FMS/ITS.	Positive	Direct	Slight	Localised	Short-term	Definite	N/A	Resource will not be lost	Easily Achievable	<b>HIGH +</b>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<b>HIGH +</b>
Health and safety	All Alternatives	During the construction phase, failure to comply with health and safety policies and protocols may result in the harm of labourers, staff, surrounding landowners and the public.	Negative	Direct, Indirect	Moderate	Study area	Short-term	Possible	Irreversible	Resource will be lost	Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>A health and safety plan in terms of the Occupational Health and Safety Act, 1993 (Act No 85 of 1993) must be adhered to and enforced by a HSE officer to ensure workers safety.</li> </ul>	<b>LOW -</b>
Air quality and dust control	All Alternatives	During the construction phase, dust generated by construction vehicles and construction activities could result in significant dust during windy conditions.	Negative	Direct	Moderate	Study area	Short-term	Definite	Reversible	Resource will not be lost	Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>During windy periods un-surfaced and un-vegetated areas must be dampened down.</li> <li>Vegetation must be retained where possible as this will reduce dust travel.</li> <li>Any complaints or claims emanating from dust issues must be attended to immediately and noted in the complaints register.</li> <li>Vehicles and construction plant must be serviced regularly so as to reduce excessive vehicle emissions.</li> </ul>	<b>LOW -</b>
	All Alternatives	During the construction phase poor maintenance and servicing of construction plant and vehicles may result in an increase in vehicle emissions in the areas.	Negative	Indirect	Moderate	Study area	Short-term	Probable	Reversible	Resource will not be lost	Achievable	<b>MODERATE -</b>		<b>LOW -</b>
On-site fire risk	All Alternatives	During the construction phase inadequate attention to fire safety awareness and fire safety equipment could result in uncontrolled fires, posing a threat to animals, vegetation and the surrounding landowners.	Negative	Direct	Moderate	Study area	Long-term	Possible	Irreversible	Resource will be lost	Easily Achievable	<b>MODERATE -</b>	<p>In order to reduce the risk of fires:</p> <ul style="list-style-type: none"> <li>All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.</li> <li>Smoking must not be permitted near flammable substances.</li> <li>No open fires must be allowed on site.</li> <li>Fire extinguishers must be available onsite.</li> </ul>	<b>LOW -</b>
<b>REHABILITATION AND MAINTENANCE</b>														
Inadequate rehabilitation and maintenance	All Alternatives	During the construction phase inadequate provision and implementation of rehabilitation measures may lead to the degradation of the surrounding environment.	Negative	Direct, Indirect	Moderate	Study area	Medium-term	Possible	Reversible	Resource will be partly lost	Easily Achievable	<b>MODERATE -</b>	The rehabilitation plan must be implemented during and after the construction has been completed.	<b>LOW -</b>
<b>TERRESTRIAL BIODIVERSITY AND ECOLOGY</b>														

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Loss of Plant Species of Conservation Concern	Preferred Alternative	During the field assessment no protected plant species were recorded within the development footprint.	Negative	Direct	Moderate	Study Area	Permanent	May occur	Reversible	Resource will be partly lost	Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>An Erosion Management Plan / Method Statement must be compiled and implemented during the Construction Phase.</li> <li>If any protected species die during the translocation process, specimen loss must be offset at a ratio of 1:3.</li> <li>Disturbed areas impacted during construction which do not form part of the installation process must be rehabilitated as soon as possible.</li> <li>The site must be monitored regularly for signs of erosion. Remedial action must be taken at the first signs of erosion.</li> </ul>	<b>LOW -</b>
Displacement and loss of faunal species due to disturbances	Preferred Alternative	During the field assessment some evidence was observed that several mammal species occur within the study area. Displacement of animal species due to disturbances (such as increased noise, foot traffic, dust) associated with construction activities	Negative	Direct	Slight	Study Area	Permanent	May occur	Reversible	Resource could be partly lost	Achievable	<b>LOW -</b>	<p>Species-specific mitigations have not been proposed.</p> <ul style="list-style-type: none"> <li>No killing of fauna must be tolerated.</li> <li>The consumption of alcohol must not be tolerated on site.</li> <li>Environmental awareness training must be conducted by the ECO before any new staff commence with work on site.</li> <li>Any fauna disturbed by construction activities must be allowed to naturally disperse into adjacent vegetation. Fauna should not be captured or killed by construction workers.</li> <li>Any excavations or holes must be checked regularly for fauna that may have either occupied the area or may fall in accidentally. The design of deep excavations should consider nearby fauna (specially reptiles).</li> <li>Construction must not take place during the evening and should be restricted between 07h00 and 17h00.</li> </ul>	<b>LOW -</b>
		<p>During the field assessment evidence was observed that several mammal species occur within the study area. One of these species are Species of Conservation Concern (SCC) was observed, namely Sensitive Species 2.</p> <p>According to Stuarts' Field Guide to Mammals of Southern Africa (2015), forty-eight (48) mammal species have a known distribution within the project area. Of the species listed, five (5) are considered Near Threatened, four (4) are considered Threatened, and one (1) is Data Deficient.</p>	Negative	Direct	Slight	Study Area	Permanent	May occur	Reversible	Resource could be partly lost	Achievable	<b>LOW -</b>		<b>LOW -</b>

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Fragmentation, Loss of Ecosystem Function and Edge Effects	Preferred Alternative	The project will result in the permanent habitat loss within the footprints of the proposed SANAL FMS/ITS project.	Negative	Direct	Slight	Study area	Permanent	Definite	Reversible	Resource will be partly lost	Achievable	<b>HIGH -</b>	<p>Mitigation Measures:</p> <ul style="list-style-type: none"> <li>The proposed development footprint must be kept as small as possible and ensure that all non- operational areas are rehabilitate to a suitable condition.</li> <li>Rehabilitation must extend into the PAOI and not only the proposed development footprint.</li> </ul>	<b>LOW -</b>
Invasion of Alien Plant Species	Preferred Alternative	Planting of species within development footprint which presumable were natural but have deteriorated over the years to form alien plant communities.	Negative	Direct	Slight	Study Area	Permanent	May occur	Reversible	Resource will be partly lost	Achievable	<b>LOW -</b>	<p>Mitigation Measures:</p> <ul style="list-style-type: none"> <li>An Alien Invasive Plant Species Control Plan must be developed by the Contractor and include both construction and operational phase requirements.</li> <li>No dumping of cleared alien vegetation must be allowed on site. All cleared material must be appropriately disposed of at a registered landfill.</li> <li>Alien invasive plant control regimes must include the entire site and PAOI.</li> </ul>	<b>LOW -</b>
Loss of Vegetation Communities	Preferred Alternative	The removal of existing natural vegetation creates 'open' habitats which favours the establishment of undesirable vegetation in areas that are typically very difficult to eradicate and could pose a threat to surrounding ecosystems.	Negative	Direct	Moderate	Study area	Permanent	Probable	Reversible	Resource will be partly lost	Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>The construction and operational footprint of the development must not extend past the footprint demonstrated within the proposed development plan. All construction laydown areas must be placed within existing disturbed areas and not within any sensitive habitat located nearby.</li> <li>All access to the proposed development must be limited to existing access roads and pathways.</li> </ul>	<b>LOW -</b>

**HERITAGE AND PALAEOLOGICAL RESOURCES**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
Loss of archaeological feature	All Alternatives	The study did not identify any archaeological receptors which will be directly impacted by the proposed project and no impact on archaeological sites or features is anticipated.	Negative	Direct	Moderate	Study area	Short Term	Definite	Irreversible	Resource will not be lost	Achievable	<b>MODERATE -</b>	No Mitigation Required	<b>LOW -</b>
Loss of historically significant building and structures	All Alternatives	The study identified two historic sites which comprise an old bridge that was built in 1951 as well as an historic dwelling and church located on the western end of the town of Cedarville. For the rest of the study area, the general landscape holds varied significance in terms of the built environment as the area comprises industrialized and urban transformed areas. No impact on built environment sites is anticipated.	Negative	Direct	Slight	Study area	Short Term	Definite	Irreversible	Resource will not be lost	Achievable	<b>LOW -</b>	No Mitigation Required	<b>LOW -</b>
Alteration of cultural landscape	All Alternatives	The larger area is located on infill (brought in for the road development). In terms of heritage resources, the general landscape around the project area is primarily well known for its Colonial / Historical Period and maritime archaeology related to urban expansion, industrialization and warfare of the past century. However, the proposed project is unlikely to result in a significant impact on the cultural landscape of this area.	Negative	Direct	Slight	Study area	Short Term	Definite	Irreversible	Resource will not be lost	Achievable	<b>LOW -</b>	No Mitigation Required	<b>LOW -</b>
Loss of paleontological significant remains	All Alternatives	SANRAL ITS Gqeberha N2 ITS Project follows the N2 road reserve which has been extensively developed and transformed in the past by the construction and continued maintenance of the N2 national road and other above and below ground infrastructure. No archaeological sites/materials were found in the project area and it is unlikely that any in situ archaeological remains will be exposed during the development.	Negative	Direct	Severe	National	Short Term	Definite	Irreversible	Resource will not be lost	Achievable	<b>MODERATE -</b>	Monitoring must preferably be undertaken simultaneous to the timing of initial excavations.	<b>LOW -</b>

Disturbance to graves/human burial sites	All Alternatives	No human burials were documented in the study area and no impact on human remains is foreseen. It should be noted that graves and cemeteries often occur within settlements or around homesteads in the rural areas of the Eastern Cape, and they are also randomly scattered around archaeological and historical settlements. The probability of informal human burials encountered during development should thus not be excluded.	Negative	Direct	Slight	Study area	Short Term	Definite	Irreversible	Resource will not be lost	Achievable	LOW -	<p>If any human bones are found during the course of construction work then they must be reported to an archaeologist and work in the immediate vicinity must cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial they would need to be exhumed under a permit from SAHRA (for pre-colonial burials as well as burials later than about AD 1500). Should any unmarked human burials/remains be found during the course of construction, work in the immediate vicinity must cease and the find must immediately be reported to the archaeologist, or the South African Heritage Resources Agency (SAHRA). Under no circumstances may burials be disturbed or removed until such time as necessary statutory procedures required for grave relocation have been met.</p>	LOW -
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<b>AQUATIC AND WETLAND IMPACTS</b>														
Direct ecosystem destruction and modification impacts	All alternatives	The hydrology of the area within which the proposed project footprint is located has been completely altered through the transformation of land to paved surfaces with an underground network of stormwater pipes designed to transport runoff from the roads and paved surfaces to the sea on the adjacent coastline. The majority of water caught within the surrounding catchment is therefore directed away from the project footprint and discharged directly into the sea and adjacent Swartkops estuary (north of the project footprint).	Negative	Direct	Slight	Surrounding area	Long-term	Definite	Reversible	Resource will not be lost	Achievable	LOW -	N/A	LOW -
Indirect hydrological and geomorphological impacts	All alternatives		Negative	Indirect	Slight	Surrounding area	Medium-term	Highly Probable	Reversible	Resource will not be lost	Achievable	MODERATE -		LOW -
Water quality impacts	All alternatives		Negative	Direct, indirect	Slight	Surrounding area	Short-term	Possible	Reversible	Resource will not be lost	Achievable	LOW -		LOW -
Fragmentation and ecological disturbance impacts	All alternatives		Negative	Direct, indirect	Slight	Surrounding area	Short-term	Definite	Reversible	Resource will not be lost	Achievable	LOW -		LOW -

**OPERATIONAL PHASE**

POTENTIAL ISSUE	ALTERNATIVES	SOURCE OF ISSUE	NATURE	TYPE	CONSEQUENCE	EXTENT	DURATION	PROBABILITY	REVERSIBILITY	IRREPLACEABLE LOSS	MITIGATION POTENTIAL	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION MEASURES	SIGNIFICANCE WITH MITIGATION
<b>ENVIRONMENTAL POLICY</b>														
Legal and policy compliance	All Alternatives	During the operation phase, failure to adhere to all permits, authorisations and regulations may lead to financial penalties and closure of the proposed SANRAL FMS/ITS project.	Negative	Direct	Severe	National	Long-term	Possible	Reversible	Resource will be partly lost	Achievable	<b>HIGH -</b>	<ul style="list-style-type: none"> <li>The proponent must ensure that operations of the SANRAL Gqeberha FMS project is compliant with the relevant legislation and policy.</li> <li>These must include (but are not restricted to): NEMA, EA, EMPr and any other permits/authorisations.</li> </ul>	<b>LOW -</b>
<b>BUILT ENVIRONMENT</b>														
Infrastructure	All Alternatives	During the operation phase, the SANRAL FMS/ITS project will improve road safety, reduce traffic congestion and road accidents by improved incident management, faster response times, improved traffic flows, improved travel times and the delivery of real time information to the public are well documented.	Positive	Direct, Indirect	Moderate	Regional	Long-term	Definite	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE +</b>	<ul style="list-style-type: none"> <li>Regular maintenance and inspections of all infrastructure and services must be undertaken.</li> </ul>	<b>MODERATE +</b>
Stormwater management	All Alternatives	During the operation phase, failure of the stormwater system and or lack of maintenance of the stormwater system may result in the erosion and or pollution of the surrounding environment should the stormwater be contaminated.	Negative	Direct, Indirect	Moderate	Study area	Long-term	Possible	Reversible	Resource will not be lost	Easily Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>Stormwater management measures such as attenuation structures, channels, etc. must be properly maintained and monitored.</li> <li>If the stormwater management measures put in place are deemed insufficient, a qualified engineer must be approached to assist with additional storm water attenuation mechanisms and remediation.</li> </ul>	<b>LOW -</b>
<b>SOCIO-ECONOMIC</b>														
Improvement of regional and national transport route	All Alternatives	The operation of the SANRAL FMS/ITS will improve regional and national transport routes which will benefit the local and national economy.	Positive	Direct	Slight	Localised	Short-term	Definite	N/A	Resource will not be lost	Easily Achievable	<b>HIGH+</b>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<b>HIGH+</b>
Job creation	All Alternatives	During the operation phase, there will be some job opportunities associated with the maintenance and functioning of the proposed SANRAL FMS/ITS.	Positive	Direct	Slight	Localised	Short-term	Definite	N/A	Resource will not be lost	Easily Achievable	<b>HIGH+</b>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<b>HIGH+</b>
<b>REHABILITATION AND MAINTENANCE</b>														



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Inadequate rehabilitation and maintenance	All Alternatives	During the operation phase inadequate rehabilitation of disturbed areas and lack of maintenance of infrastructure may lead to the degradation of the surrounding environment.	Negative	Direct, Indirect	Moderate	Study area	Medium-term	Possible	Reversible	Resource will be partly lost	Easily Achievable	<b>MODERATE -</b>	Disturbed areas must be rehabilitated/prepared to allow natural re-vegetation.	<b>LOW -</b>
<b>TERRESTRIAL BIODIVERSITY AND ECOLOGY</b>														
Invasion of Alien Plant Species	Preferred Alternative	Failure to rehabilitate and monitor the establishment of alien plant species during the Operation Phase could lead to the spread and infestation of Alien Plant Species. Alien plant species often outcompete indigenous vegetation. Therefore, their establishment and spread could result in the loss of indigenous plant species.	Negative	Direct	Slight	Study Area	Permanent	May occur	Reversible	Resource will be partly lost	Achievable	<b>LOW -</b>	<ul style="list-style-type: none"> <li>The site must be checked regularly for the presence of alien invasive species. When alien invasive species are found, immediate action must be taken to remove them.</li> <li>The ECO must create a list with accompanying photographs of possible alien invasive species that could occur on site prior to construction. This photo guide must be used to determine if any alien invasive species are present.</li> <li>An Alien Invasive Method Statement/ Management Plan must be compiled and implemented during the Construction and Operational Phase of the proposed project.</li> </ul>	<b>LOW -</b>
Loss of Plant Species of Conservation Concern	Preferred Alternative	During the field assessment no evidence was observed that SCC occur in/near the study area.	Negative	Direct	Moderate	Study Area	Permanent	May occur	Reversible	Resource will be partly lost	Achievable	<b>MODERATE -</b>	<ul style="list-style-type: none"> <li>No plant species (SCC or common) must be harvested or removed from site without approval from the ECO or Applicant in writing.</li> <li>If any protected species die during the translocation process, specimen loss must be offset at a ratio of 1:3.</li> </ul>	<b>LOW -</b>
Loss of faunal species of conservation concern	Preferred Alternative	During the field assessment no evidence was observed that species could occur within the study area.	Negative	Direct	Slight	Study Area	Permanent	May occur	Reversible	Resource could be partly lost	Achievable	<b>LOW -</b>	<p>Species-specific mitigations have not been proposed.</p> <ul style="list-style-type: none"> <li>No killing of fauna must be tolerated.</li> <li>Any lighting must not point outwards toward any natural habitat and must be focus downwards or towards the development.</li> </ul>	<b>LOW -</b>



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Dispersal barrier and/or road mortalities	Preferred Alternative	Collision of bird species with camera poles	Negative	Direct	Moderate	Study Area	Long-term	Probable	Irreversible	Resources may be partly lost	Difficult	<b>LOW-</b>	<ul style="list-style-type: none"> <li>Natural and semi-natural grassland areas, specifically that of East Griqualand Grassland (EN) and Mabela Sandy Grassland, must be avoided as far as feasibly possible during construction.</li> <li>Where possible, scheme enhancements (e.g., road verges) must be implemented for roadside habitat creation, or the relinking of severed patches and improvement of degraded habitat links.</li> </ul>	<b>LOW-</b>
<b>WATERCOURSE AND WETLAND IMPACTS</b>														
Direct ecosystem destruction and modification impacts	All alternatives	The hydrology of the area within which the proposed project footprint is located has been completely altered through the transformation of land to paved surfaces with an underground network of stormwater pipes designed to transport runoff from the roads and paved surfaces to the sea on the adjacent coastline. The majority of water caught within the surrounding catchment is therefore directed away from the project footprint and discharged directly into the sea and adjacent Swartkops estuary (north of the project footprint).	Negative	Direct	Slight	Study Area	Long-term	Definite	Reversible	Resource will not be lost	Achievable	<b>LOW -</b>	<ul style="list-style-type: none"> <li>It is the applicant's responsibility to ensure the proper functioning of the road stormwater system. Importantly, the drainage / stormwater management system and related infrastructure is likely to require regular on-going maintenance.</li> <li>It is the applicant's responsibility to ensure the proper functioning of infrastructure that is likely to require regular on-going maintenance.</li> </ul>	<b>LOW -</b>

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Indirect hydrological and geomorphological impacts	All Alternatives		Negative	Indirect	Slight	Surrounding area	Long-term	Probable	Reversible	Resource will not be lost	Achievable	LOW -	<ul style="list-style-type: none"> <li>It is important that the location and extent of the rivers in the vicinity of project activities be incorporated into all formal maintenance and repair plans for the project.</li> <li>In terms of management, alien invasive plant control must be practiced on an on-going basis in line with the requirements of Section 2(2) and Section 3 (2) the National Environmental Management: Biodiversity Act (NEM:BA), which obligates the landowner/developer to control IAPs on their property.</li> </ul>	LOW -
Water quality impacts	All Alternatives		Negative	Direct	Slight	Surrounding area	Long term	Probable	Reversible	Resource may be partially lost	Achievable	LOW -		LOW -
Fragmentation and ecological disturbance impacts	All Alternatives		Negative	Direct	Slight	Surrounding area	Long term	Probable	Reversible	Resource may be partially lost	Achievable	LOW -		LOW -