

IMPACT ASSESSMENT OF THE PREFERRED SITE AND ALTERNATIVE

PLANNING AND DESIGN PHASE

IMPACT DESCRIPTION				PRE-MITIGATION												PROPOSED MITIGATION	POST-MITIGATION												IMPACT STATEMENT
				ALTERNATIVE A1 - Southern Site						ALTERNATIVE A2 - Northern Site							ALTERNATIVE A1 - Southern Site						ALTERNATIVE A2 - Northern Site						
	Activity	Aspect	Impact	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence		
DIRECT IMPACTS																													
Heritage Impacts	Site Selection	Site Position	Position on heritage sites	6	5	1	2	24	D	6	5	1	3	36	D	Select site least likely to impact on heritage sites. Appoint heritage specialist at design phase to assist with identification of heritage areas associated with sites.	6	5	1	1	12	D	8	5	1	1	14	D	Heritage sites have been identified in the area, but it will be possible to site the proposed substation site to avoid any impacts to heritage sites.
	Access	Access road	Passing through heritage sites	6	5	1	3	36	D	6	5	1	3	36	D	Use specialist to identify all heritage sites along preferred access road alignment . Ensure road sited away from any heritage. If sites are located nearby, ensure they clearly demarcated prior to construction .	6	5	1	1	12	D	8	5	1	1	14	D	Heritage sites have been identified in the greater area, but it will be possible to site the proposed access road to either substation site to avoid any impacts to heritage sites.
Avifaunal Impacts	Site Selection	Site Position	Interference with flight paths and bird strikes	6	4	1	4	44	P	8	4	1	4	52	P	Select site least likely to impact on avifaunal flight paths. Appoint avifaunal specialist to assist with specific location of site .	6	4	1	2	22	P	6	4	1	2	22	P	Bird activity is not expected to vary too greatly from one site to another due to their spatial proximity, but the fact that A1 is located in an anthropogenically disturbed area indicates that it is most likely more suitable.
	Equipment design	Equipment layout and design	Potential for bird electrocutions on Substation structures	6	4	1	2	22	P	6	4	1	4	44	P	Ensure site layout and structure design are optimum for deterring bird activity and preventing electrocutions . Also ensure that suitable bird repelling structure, such as bird guards are considered in the design.	6	4	1	2	22	P	6	4	1	2	22	P	
Social and Socio-economic impacts	Site Selection	Site Position	Loss of agricultural land	6	4	1	3	33	D	6	4	1	2	22	D	Avoid placement in crop lands directly wherever possible. This can be readily achieved for both sites .	6	4	1	1	11	D	6	4	1	1	11	D	The sites have been selected to avoid any impact to existing agricultural activities.

	Site Selection	Site Position	Impact on tourism activities	6	4	1	2	22	P	6	4	1	5	55	P	Select site least likely to impact on tourist activities.	6	4	1	2	22	P	6	4	1	5	55	P	The northern site is located within a private game reserve and hence not considered a compatible landuse for a tourist destination.
<b>Vegetation Impacts</b>	Site Selection	Site Position	Loss of indigenous vegetation	4	4	1	2	18	D	8	4	1	5	65	D	Select site least likely to impact negatively on indigenous vegetation.	4	4	1	1	9	D	8	4	1	4	52	D	The construction of a substation on the northern site cannot avoid damage to indigenous vegetation that has been maintained in a pristine state due to being part of private game reserves.
	Site Selection	Site Position	Loss of species diversity	6	4	1	2	22	D	8	4	1	5	65	D	Where possible locate substation on site least likely to impact on indigenous vegetation biodiversity.	6	4	1	1	11	D	8	4	1	5	65	D	The construction of a substation on the northern site cannot avoid damage to indigenous vegetation and potential loss of species biodiversity .
	Site Selection	Site Position	Loss of rare or endangered species	6	4	1	1	11	D	8	4	1	4	52	D	Where possible locate substation on site least likely to impact on rare or endangered species. Ensure specialist undertakes study of chosen site to identify, rescue and remove rare and endangered species.	6	4	1	1	11	D	8	4	1	3	39	D	Due to disturbed nature of the southern site, it is unlikely that rare and endangered species will be present on this site.
<b>Visual Impacts</b>	Site Selection	Site Position	Substation becoming visibly obvious	4	4	2	4	40	D	6	4	2	5	60	D	Place substation back from the edge of any road routes. Ensure substation not positioned on elevated slope. Leave indigenous vegetation in place around the substation where possible to provide screening	4	4	2	1	10	D	6	4	2	3	36	D	The southern site is more likely to be visible on the N2, but can be readily screened. .
<b>Ecological Impacts</b>	Site Selection	Site Position	Habitat transformation	6	4	2	1	12	D	8	4	2	5	70	D	Select site least likely to impact on the natural ecology . Maintain construction footprint as small as possible.	6	4	1	1	11	D	8	4	1	3	39	D	Habitat transformation is likely to be less of impact on southern site because impacts already experienced due to the higher level of agricultural activities while the northern site is located in a game reserves. Also already existing access to the southern site will prevent further transformation
	Site Selection	Site Position	Terrestrial fauna Impacts	6	4	2	1	12	D	8	4	2	5	70	D	Select site least likely to impact on terrestrial fauna .	6	4	1	1	11	D	8	4	1	3	39	D	Terrestrial fauna impacts are likely to be less on southern site due to the relatively higher level of anthropogenic activity in the area compared to the northern site which passes through a game reserve.

Conservation Areas	Site Selection	Site Position	Degrading of conservation areas	6	4	1	1	11	D	8	4	3	5	75	D	Select site least likely to introduce new impact in previously non-impacted conservation areas . Maintain construction footprint as small as possible.	6	4	1	1	11	D	8	4	1	4	52	D	Placement of the substation on the northern site which is in a private game reserve will bring about some degradation to the game reserve especially negative impacts visually and on sense of place.
Landuse	Site Selection	Site Position	Introduction of non-compatible landuse	6	4	1	2	22	D	8	4	1	4	52	D	Select siteleast likely to introduce new incompatible landuse into new areas	6	4	1	2	22	D	8	4	1	4	52	D	Placement of the substation on the northern site which located in a private game reserve will introduce a landuse that can be viewed as non-compatible in these conservation areas.
CUMULATIVE IMPACTS								24						54															
Economic Development	Power Supply to Region	Strengthening of the grid	Construction of the 132 substation will ensure increased power supply to the Golela development node	10	4	3	5	85	D	10	4	3	5	85	D		10	4	3	5	85	D	10	4	3	5	85	D	Increased, stable power supply to the Golela development node will assist with improving economic development in the region, alleviating poverty and assist with provision of basic services to all - HIGH POSITIVE IMPACT

IMPACT ASSESSMENT OF THE PREFERRED SITE AND ALTERNATIVE  
CONSTRUCTION PHASE

IMPACT DESCRIPTION				PRE-MITIGATION IMPACT SIGNIFICANCE										PROPOSED MITIGATION	POST-MITIGATION IMPACT SIGNIFICANCE										IMPACT STATEMENT							
				ALTERNATIVE A1 - Southern Substation Site					ALTERNATIVE A2 - Northern Substation Site						ALTERNATIVE A1 - Southern Substation Site					ALTERNATIVE A2 - Northern Substation Site												
	Activity	Aspect	Impact	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence					
DIRECT IMPACTS																																
Heritage ImpactsA7:AJ7A				Access roads, bush clearing, foundation construction, Equipment assembly & erection.	Construction	Damage to or destruction of archaeological and heritage sites	6	5	1	2	24	D	6	5	1	2	24	D	Ensure all identified sites are clearly demarcated prior to construction and that all persons on site are sensitised to the issue and the significance. Stop work if new site exposed during construction. Notify relevant authorities.	6	5	1	1	12	D	6	5	1	2	24	D	The area is not highly populated with heritage sites and careful site selection will ensure no damage during construction.
Avifaunal Impacts				Access roads, bush clearing, foundation construction, Equipment assembly & erection.	Construction	Disturbance of birds, damage to nests or nesting grounds	4	2	1	4	28	P	4	2	1	4	28	P	Demarcate areas where known nesting grounds are located. Sensitise employees to issue. Ensure all construction remains in footprint area. Ensure access roads clearly marked and adhered to	4	2	1	2	14	P	4	2	1	2	14	P	There will be some disturbance to bird life during construction but this can be reduced by implementing simple mitigation measures.
Social and Socio-economic impacts				Access roads, bush clearing, foundation construction, Equipment assembly & erection.	construction	Damage to agricultural lands	4	2	1	2	14	D	4	2	1	2	14	D	Ensure all construction remains in agreed footprint area. Ensure access roads clearly marked and adhered to.	4	2	1	1	7	D	4	2	1	1	7	D	If access and stringing managed properly by the contractor, there will be no damage to crops
				Access roads, bush clearing, foundation construction, Equipment assembly & erection.	construction	Disturbance of tourism activities	6	2	1	3	27	D	6	2	1	5	45	D	Design and time construction activities in association with landowners to minimise the interference effects. Take note of hunting season requirements.	6	2	1	1	9	D	6	2	1	3	27	D	Construction will have a negative impact on tourism especially for the northern site but proper planing of construction will reduce the impact. Impact is non-existent at the southern site

Vegetation Impacts	Clearing of site and access roads	Bush clearing	Loss of rare or endangered species	8	2	1	2	22	D	8	2	1	4	44	D	Ensure specialist identifies presence of rare and endangered species prior to construction. Carry out search and rescue at all sites.	8	2	1	2	22	D	8	2	1	2	22	D	If no controls are in place then there is a chance that some rare or endangered species will be damage during these activities. The probability is less on the western route than the eastern route.
	Clearing of site and access roads	Bush clearing	Unnecessary loss of indigenous vegetation	6	2	1	1	9	D	8	2	1	4	44	D	Use existing access routes where possible. Ensure competent bush clearer appointed to clear alignments. Ensure only required clearing is undertaken. Ensure area to be cleared is properly and clearly demarcated.	6	2	1	1	9	D	6	2	1	2	18	D	Clearing of an incorrect servitude or access route can cause unnecessary clearing of vegetation. The probability is less along the western corridor than the eastern corridor.
	Access roads and bush clearing	Bush clearing of site and access routes	Increased risk of invader species encroachment	8	5	1	4	56	D	8	5	1	4	56	D	An invader species eradication and management plan must be developed for the construction phase and must be implemented consistently throughout construction phase	6	5	1	2	24	D	8	5	1	2	28	D	The clearing of indigenous vegetation creates an opportunity for encroachment by invader species in to ares that are relatively pristine. The severity of this impact will be more significant along the eastern corridor than western.
	Access roads and bush clearing	Clearing of invader species	Control of invader species along access roads and servitude - POSITIVE IMPACT	6	4	2	4	48	D	6	4	2	2	24	D	Ensure policies are strictly and consistently enforced through construction phase.	6	4	2	4	48	D	6	4	2	2	24	D	The bush clearing and invader species management policies of eskom encourage clearing and managent of invader species in the entire project area - POSTIVE IMACT. This impact is more significant on western corridor than eastern.
Surface Water and Wetland Impacts	Substation site	Bush clearing	Bush clearingand construction can result in incresed stormwater run-off and erosion	6	4	1	4	44	D	6	4	1	4	44	D	Stormwater cut-off drains must be implemented to prevent stormwater running across substation site.	6	4	1	1	11	D	6	4	1	1	11	D	Stormwater onto and off the site must be controlledr

<b>Noise Impacts</b>	Access roads, bush clearing, foundation construction, tower assembly & erection, stringing	Construction	Operation of construction equipment and vehicles will increase noise levels	4	2	1	4	28	D	4	2	1	4	28	D	Ensure all vehicles and equipment are in good working order and within allowable noise ranges. Equipment exceeding allowable must be equipped with silencers or removed from site. Operations should occur during acceptable working hours. All noise complaints shall be recorded, investigated and rectified immediately. Construction camps and batching plants must be sited outside of conservation areas.	4	2	1	4	28	D	4	2	1	4	28	D	Noise levels will increase on site only.
<b>Air Pollution</b>	Access roads, bush clearing, foundation construction, tower assembly & erection, stringing	Construction	Movement of vehicles will result in dust impacts	4	2	1	3	21	D	4	2	1	3	21	D	Where sensitive environments are identified or complaints received dust suppression must be implemented. Vehicle speeds must be limited to slow speeds on gravel roads and tracks. Dust complaints must be recorded, investigated and addressed immediately.	4	2	1	3	21	D	4	2	1	3	21	D	Dust will be generated at construction sites and along access roads.
<b>Fires</b>	Access roads, bush clearing, foundation construction, tower assembly & erection, stringing	Construction	Movement of vehicles through dry grassland can cause fires. Work forces increase the risk of fire in an areas.	8	1	2	4	44	D	8	1	2	4	44	D	No open fires will be permitted on site. Smoking may only occur during controlled breaks at a designated smoking area with appropriate fire protection facilities. Long grass to be trimmed or flattened along access routes.	8	1	2	4	44	D	8	1	2	4	44	D	Risk of fire is high during the winter months and requires risk management

Traffic Impacts	Access roads, bush clearing, foundation construction, tower assembly & erection, stringing	Site access and operations	Construction will result in increased traffic flow in specific routes in the region which may impact on other users	4	2	3	2	18	D	4	2	3	2	18	D		4	2	3	2	18	D	4	2	3	2	18	D	The number of vehicles is not expected to increase flow volumes on provincial roads substantially.
Operational Impacts	Access roads, bush clearing, foundation construction, tower assembly & erection, stringing	Use of hazardous substances	Spillage of hazardous substances into the natural environment	6	3	1	4	40	D	6	3	1	4	40	D	All vehicles and equipment must be in good working order. Equipment/vehicles with permanent leaks must be removed from site. Drip trays must be available with all vehicles and all areas where hazardous substances are being used.	6	3	1	2	20	D	6	3	1	2	20	D	The potential for spills of hazardous substances from leaking fuel tanks, diffs and from handling errors exists but can be managed.
	Access roads, bush clearing, foundation construction, tower assembly & erection, stringing	Waste management	Poor waste management can cause environmental damage	6	2	1	3	27	D	6	2	1	3	27	D	An integrated waste management plan must be compiled during site establishment and must be implemented continuously throughout the construction phase.	6	2	1	3	27	D	6	2	1	3	27	D	Poor waste management can lead to soil, water and air pollution.
INDIRECT IMPACTS																													
Vegetation Impacts	Bush clearing and Construction	Vegetation removal	Vegetation removal can increase erosion potential	6	2	1	4	36	D	6	2	1	4	36	D	Bush clearing may only occur through cutting or trimming. No scalping or ploughing is permitted.	4	2	1	2	14	D	4	2	1	2	14	D	If the servitude, access routes and construction areas are denuded, there will be a significant increase in erosion
	Bush clearing and Construction	Vegetation removal	Loss of topsoil	6	2	1	4	36	D	6	2	1	4	36	D	Bush clearing may only occur through cutting or trimming. No scalping or ploughing is permitted. Topsoil removed from foundation sites or drum stations must be removed and stored for rehabilitation and protected from erosion during storage.	6	2	1	2	18	D	6	2	1	2	18	D	If the servitude, access routes and construction areas are denuded, there will be a significant increase in erosion and loss of topsoil

	Vehicle Access	Establishment of multiple access tracks	Environmental damage beyond minimal impact footprint.	8	3	2	4	52	D	8	3	2	4	52	D	Ongoing maintenance of access roads and tracks to ensure access through all weather conditions must occur. Drivers must be sensitised to the issue of creating illegal multiple tracks.	8	3	2	2	26	D	8	3	2	3	39	D	During wet weather, access roads can become severely damaged and impact on use. This encourages drivers to find alternarate route.
	Access and Construction	Hardening of surfaces	Inhibition of vegetation reestablishment	6	3	1	4	40	D	6	3	1	4	40	D	All hardened surfaces will be ripped during the rehabilitation phase to assist with rapid vegetation re-establishment.	6	3	1	2	20	D	6	3	1	2	20	D	Hardening of soil surfaces will prevent the re-establishment of vegetation.
Ecology	All activities	Construction	Fragementation of habitats	4	2	1	3	21	D	4	2	1	5	35	D	Can be limited by minimising clearance wherever possible; by ensuring good discipline of vehicle movements on site and staying on one track.	4	2	1	3	21	D	4	2	1	3	21	D	Activities during construction will divide up the continuity of habitats and prevent natural movements.
Traffic Impacts	Access	Use of public roads	Deterioration of public roads	8	2	3	4	52	D	8	2	3	4	52	D	Ensure vehicles are not overloads. Repair damage caused by construction vehicles to private roads immediately.	4	2	3	2	18	D	4	2	3	2	18	D	Movements of construction equipment on construction roads can cause damage.
Agriculture	Access and construction	All activities	Loss of productivity due to interference with farming activities or hunting activities	6	2	1	4	36	D	6	2	1	4	36	D	Contractor to liaise with landowners to correlate farm/ hunting activities with construction activities to ensure no interference.	6	2	1	3	27	D	6	2	1	3	27	D	Movements of construction equipment on construction roads can cause damage.
CUMULATIVE IMPACTS																													
Economic Development	All activities	Employment	Creation of temporary jobs during construction - POSITIVE IMPACT	6	2	2	4	40	D	6	2	2	4	40	D	Contractor to employ as many local labourers as is feasibly possible. Contractor to have skills development plans in place.	8	4	2	5	70	D	8	4	2	5	70	D	Construction phase will create temporary jobs for unskilled labour and drivers. This will result in a significant moderate positive impact in the area.



IMPACT ASSESSMENT OF THE PREFERRED ROUTE AND ALTERNATIVE  
OPERATIONAL PHASE

IMPACT DESCRIPTION				PRE-MITIGATION SIGNIFICANCE												PROPOSED MITIGATION	POST-MITIGATION SIGNIFICANCE												IMPACT STATEMENT
				ALTERNATIVE A1 - Western Corridor						ALTERNATIVE A2 - Eastern Corridor							ALTERNATIVE A1 - Western Corridor						ALTERNATIVE S2 - Eastern Corridor						
	Activity	Aspect	Impact	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence	Magnitude	Duration	Scale	Probability	Significance	Confidence		
DIRECT IMPACTS																													
Avifaunal Impacts	Operation	Electrified Conductor	Electrocution of avifauna and collisions	4	4	1	3	27	D	4	4	1	3	27	D	Ensure that all these structures remain in working order at all times. If an increase in bird strikes is observed, then bird diverter and bird guard placement may have to reviewed and improved.	4	4	1	2	18	D	4	4	1	2	18	D	This impact will be low during operation due to the placement of bird diverters to increase the visibility of the conductor. The tower structure to be used reduces the probability of bird electrocutions and bird guards will be implemented where required.
Fires	Conductor	Conductor failure	Ignition of veld resulting in fires	10	4	3	2	34	P	10	4	3	2	34	P	Regular line inspections to ensure the integrity of the line.	10	4	3	2	34	P	10	4	3	2	34	P	Fires do occur on occasion as a result of conductor failure. However, design has been optimised to prevent such events wherever possible
Servitude Maintenance	Bush Clearing	Lack of bush clearing	Overgrown servitude and associated electrical clearance problems	10	4	3	3	51	P	10	4	3	3	51	P	Eskom to ensure that the vegetation clearance and line maintenance occurs as per Eskom Policies.	6	4	1	2	22	P	6	4	1	2	22	P	This impact has been rated moderate due to the number of issues raised by landowners in the area relating to poor servitude maintenance.

	Access	Poor maintenance of access tracks	Poor maintenance of access tracks results in erosion of these tracks.	6	4	1	4	44	P	6	4	1	4	44	P	Eskom to ensure that the access mainteance occurs as per Eskom Policies. Suggest cooperating with landowner to maintain access tracks.	6	4	1	2	22	P	6	4	1	2	22	P	This impact has been rated moderate due experience of other eskom lines where maintenance of the access tracks is non-existent and significant erosion features have developed
INDIRECT IMPACT																													
Servitude Maintenance	Access	Lack of security	Poor lock management on Eskom servitude gates exposes landowners to illegal trespassers and provides access to criminals.	8	4	1	3	39	P	8	4	1	3	39	P	Eskom to ensure that the access mainteance servitude gates and locks occurs as per Eskom Policies. Suggest cooperating with landowner to maintain security .	8	4	1	2	26	P	8	4	1	2	26	P	This impact has been rated moderate due experience of other eskom lines where lock management on servitude gates has assisted criminal access to private land.
Provision of Electricity	Faulting	Loss of stable electricity supply i.e. outages	Impact on businesses, schools, hospitals etc through non-availability of power	8	1	3	2	24	D	8	1	3	2	24	D	Strict maintenane regieme must be upheld to ensure faulting levels remain low.	8	1	3	2	24	D	8	1	3	2	24	D	This impact has been rated Low as the commissioning of this proposed powerline will reduce the risk of faulting and power outages in the region
CUMULATIVE IMPACTS																													
Economic Development	Power Supply to Region	Strengthening of the grid	Strengthening of the grid will ensure uninterrupted electricity supply in Northern Zululand	10	4	3	4	68	D	10	4	3	4	68	D		10	4	3	4	68	D	10	4	3	4	68	D	Strengthening of the will assist with improving economic development in the region, alleviating poverty and assist with provision of basic services to all - HIGH POSITIVE IMPACT