BioTherm Energy - Esizayo Powerline

Impacts Identified in the BAR

Significance Rating Table

Construction Phase

Alternative 1- Substation 1, Route Option 1

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology for the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
Disturbance to underlying geology for the construction of the Substation	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
Reduction in land availaibility for grazing animals due to theland	Nature of impact:	Dircet							
	Without Mitigation	2	2	4	5	40	Medium	-	Medium
	degree to which impact can be reversed:	Low							

animals due to theland being occupied by the transmission and substation infrastructure	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum.							
	With Mitigation	1	2	2	4	20	Low	-	Medium
Increased potential for soil erosion due to vegetation clearance, soil disturbance and a high traffic movement onsite.	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum. Traffic of construction vehicles should be kept to a minimum to reduce soil							
	With Mitigation	1	2	2	2	10	Low	-	Medium
Potential spillage of hazardous substances such as oils, fuel, grease from construction vehicles, and sewage from on-site sanitation systems	Nature of impact:	Direct							
	Without Mitigation	2	2	2	2	12	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and proper							
	With Mitigation	1	2	0	1	3	Low	-	Medium
Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Construction of the powerlines should occur during the dry season and the site rehabilitated before major rainfall events occur. Powerlines must only cross perpendicular to a watercourse and the chosen alignment must							

	With Mitigation	2	2	2	3	18	Low	-	Medium
Temporary degradation of wetland/riparian habitat due to the proposedproposed positioning of the powerlines and pylons	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The WULA application will require detailed functional assessments (i.e. PES, EIS and EcoServices) of freshwater habitats potentially affected by the site and powerlines. At this stage design details should be available allowing the freshwater specialist to assess specific areas within the site. Therefore, a more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of pylon positions in relation to freshwater habitats. A freshwater habitat specialist be present onsite during the construction phase of the project, and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses which may be affected by the actions conducted during the construction phase.							
	With Mitigation	1	2	4	3	21	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							

Potential contamination of groundwater through	Mitigation Measures	• All equipment that has the potential to spill or leak must have a drip tray underneath at all times. • Cement must be mixed on an impermeable surface and not on the bare ground. • Any spilled or waste concrete onsite must be removed immediately and disposed of appropriately. • Adequate ablution facilities must be placed onsite. • All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.							
	With Mitigation	1	1	2	2	8	Low	-	
Impacts on vegetation and protected plant species	Nature of impact:	Direct							
	Without Mitigation	2	2	8	4	48	Medium	-	
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. • Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. • Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. • All roads built for construction should have water diversion and erosion control structures present, especially in steep areas. • Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. • Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised							
	With Mitigation	2	2	4	3	24	Low	-	
	Nature of impact:	Direct							

Impacts on Fauna due to construcction activities	Without Mitigation	2	2	4	3	24	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Preconstruction walk-through of the power line to identify areas of faunal sensitivity. • During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. • The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. • No fires should be allowed within the site as there is a risk of runaway veld fires. • No fuelwood collection should be allowed on-site. • No dogs or cats should be allowed on site apart from that of the landowners. • If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill							
	With Mitigation	1	2	2	3	15	Low	-	
Increased Soil Erosion risk during construction	Nature of impact:	Direct							
	Without Mitigation	2	2	8	4	48	Medium	-	
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Runoff management and erosion control should be integrated into the project design. • Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. • Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. • Regular monitoring for erosion problems along the access roads and other cleared areas. • Erosion problems should be rectified on a regular basis. • Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season. • A low cover of vegetation should be left wherever possible within the construction footprint to bind the soil,							

	With Mitigation	2	2	2	3	18	Low	-	
Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	2	1	4	2	14	Low	-	Medium
Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation	Nature of impact:	Direct							
	Without Mitigation	1	1	4	3	18	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially							
	With Mitigation	1	1	2	3	12	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	4	5	8	2	34	Medium	-	Medium

Physical disturbance of archaeological sites during the construction of the powerlines	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	• A 20m buffer must be placed around the colonel ruins idenitified at Substation 1 and must be declared a “No-Go” area; • If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified; • If any human remains are uncovered during the excavations for pylons, work must stop in that area and HWC must be alerted immediately							
	With Mitigation	4	5	6	1	15	Low	-	Medium
Physical disturbance of archaeological sites during the construction of Substation 1	Nature of impact:	Direct							
	Without Mitigation	4	5	8	4	68	High	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• The proposed location of substation 1 needs to be shifted to prevent any damage to the colonel ruins; • A 20m buffer must be placed around the colonel ruins identified at Substation 1 and must be declared a “No-Go” area; • If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified; • If any human remains are uncovered during the excavations for pylons, work must stop in that area and HWC must be alerted immediately.							
	With Mitigation	4	5	6	2	30	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	1	5	2	2	16	Low	-	Medium
	degree to which impact can be reversed:	Low							

Physical disturbance of palaeontological sites	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Monitoring of all surface clearances and substantial excavations (>1m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. • Safeguarding of chance fossil finds (preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape. • Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with the pertinent contextual data.							
	With Mitigation	1	5	2	1	8	Low	-	Medium
Visual impact during construction due to dust, vehicles and equipment	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium- High
	degree to which impact can be reversed:	High- The visual impact can be completely reversed if vehicles, equipment, rubble and any other construction materials are removed after construction.							
	degree of impact on irreplaceable resources:	Low- Dust and equipment are not likely to impact on any irreplaceable visual resources.							
	Mitigation Measures	• The handling and transportation of materials which may generate dust must be avoided during high wind conditions. • The building site and construction facilities must be well maintained and strictly controlled. • Dust and Litter control measures must be included in the EMPr.							
	With Mitigation	2	2	4	3	24	Low	-	Medium- High
Visual impact during construction due to vegetation clearing	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium- High
	degree to which impact can be reversed:	High- The visual impact can becompletely reversed, if vegetation is rehabilitated.							
	degree of impact on irreplaceable resources:	Low- From a visual perspective can be re-established.							
	Mitigation Measures	• The construction footprint must be kept as small as possibke, to avoid unneccessary disruption to the existing vegetation.							
	With Mitigation	2	2	4	3	24	Low	-	Medium- High
	Nature of impact:	Direct							

Increased traffic generation around the study area by construction vehicles-	Without Mitigation	2	1	2	3	15	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. • intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. • Construction vehicles should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.							
	With Mitigation	2	1	2	2	10	Low	-	
Acoustic impact on residential receptors	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	High
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	• Planning construction activities in consultation with local communities so that activities witj the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance.							
	With Mitigation	2	2	4	3	24	Low	-	High
Increase in employment opportunities	Nature of impact:	Direct							
	Without Mitigation	3	2	4	3	27	Low	+	Medium
	degree to which impact can be reversed:	None							
	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly semi-skilled and unskilled opportunities;							

	With Mitigation	3	2	4	4	36	Medium	+	Medium
Disruption through influx of job seeks	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control influx of job seekers and associated local impacts							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Manage employment expectations as far as possible, prioritise local employment, engage with local municipality in respect of accommodation of labour / staff brought into the area by contractors/developer							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Increase in communicable diseases and reduced public health	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control communicable disease which could permanently impact local populations							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	Development of a labour force Health and Safety Plan, HIV/AIDS awareness, prevention and testing campaign							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Nuisance from noise, dust and traffic disturbances	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Medium - implementation of EMPr measures to reduce noise, dust and traffic related impacts, but unlikely to negate completely							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by the relevant specialists and included in the EMPr							
	With Mitigation	2	2	2	2	12	Low	-	Medium
	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium

Increased risk to neighbouring land users	degree to which impact can be reversed:	High - provision of compensation to farmers for damage to infrastructure, stock theft, etc.							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Development of a code of conduct for construction workers, to be signed by the contractor; Contractor to be held liable for compensating farmers for any losses and/or damage that can be linked to construction workers							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Increased risk of veld fires	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium
	degree to which impact can be reversed:	High - provision of compensation to farmers for losses resulting from veld fires							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Implementation of EMPr i.e. mitigation in respect of construction phase activities that may pose a fire risk (i.e. no open fires allows on site for cooking/heating; activities that pose a fire risk to be property managed and confined to							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Impacts on vegetation and protected plant species	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								

Faunal impacts due to construction activities	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Increased Soil Erosion risk during construction	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
The no-go option will result in no additional impacts on avifauna and will maintain the current ecological integrity	Nature of impact:	Direct							
	Without Mitigation								
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	-	Medium

Loss of employment and local economic development	degree to which	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	3	5	2	5	50	Medium	-	Medium
Maintenance of the existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	+	
	degree to which impact can be	Direct							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	2	5	2	5	45	Medium	+	Medium

BioTherm Energy - Esizayo Powerline

{insert specialist filed here}

Significance Rating Table

Operational Phase

Alternative 1- Substation 1, Route Option 1

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology	Nature of impact:	N/A							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Reduction in land availaibility for grazing animals due to theland being occupied by the transmission and substation infrastructure	Nature of impact:	Direct							
	Without Mitigation	2	4	4	5	50	Medium	-	Medium
	degree to which impact can be reversed:	Medium							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Powerline and substation Infrastructure should be limited to the extent of the project footprint, and activities outside of the site should be kept to a minimum.							

	With Mitigation	1	4	2	3	21	Low	-	Medium
Vegetation cleared for powerlines and substation, soil disturbance and stockpiles, and increased traffic movement on site, resulting in a higher potential for soil erosion.	Nature of impact:	Direct							
	Without Mitigation	2	4	4	3	30	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of disturbance should be (where practical) limited to the extent of the project footprint, and activities outside of the site should be kept to a minimum. Traffic of maintenance vehicles should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. Long term soil stockpiles should be appropriately stored with the use of vegetation cover. Wind erosion is dominant for the region. Water erosion action is considered limited, however backfilling with soil and use of gabions or Reno Mattresses should be used where evidence of erosion is present.							
	With Mitigation	1	2	2	2	10	Low	-	
Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles.	Nature of impact:	Direct							
	Without Mitigation	2	4	2	2	16	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and proper upkeep of machinery and vehicles.							
	With Mitigation	1	4	0	1	5	Low	-	Medium
Alterations of flow regimes of watercourses, in close	Nature of impact:	Direct							
	Without Mitigation	2	5	4	4	44	Medium	-	Medium
	degree to which impact can be reversed:	High							

of watercourses, in close proximity to the site, or that is proposed to be traversed.	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Powerlines must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to restrict the number of pylons within a system (which should be avoided as far as possible). The proposed powerlines and pylons should be positioned above the 1:100 floodline of any watercourse.							
	With Mitigation	2	1	2	2	10	Low	-	Medium
Permanent degradation of wetland/riparian habitat due to the proposedproposed positioning of the powerlines and pylons	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Potential contamination of groundwater through leaks or spills of oil, grease or fuel.	Nature of impact:	Direct							
	Without Mitigation	2	5	2	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	All equipment that has the potential to leak oil or fuel must be placed under a drip tray. Vehicles associated with the maintenace activities are to be serviced and kept in good working order.							
	With Mitigation	1	5	0	2	12	Low	-	
	Nature of impact:	Direct							

Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase	Without Mitigation	2	5	4	3	33	Medium	-	
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Erosion management at the site should take place according to the Erosion and Rehabilitation Plan. • All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Nature of impact:	Direct							
	Without Mitigation	2	4	4	3	30	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. • Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems.							
	With Mitigation	1	4	2	2	14	Low		
	Nature of impact:	Direct							

Collisions of Red Data avifauna with the earthwire of the proposed 132kV powerlines	Without Mitigation	3	4	10	4	68	High	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	• A walk-through must be conducted by the avifaunal specialist after final pole positions have been determined, to demarcate sections of line that will need to be mitigated with Bird Flight Diverters (BFDs).							
	With Mitigation	3	4	10	3	51	Medium	-	Medium
Electrocution of Red Data avifauna	Nature of impact:	Direct							
	Without Mitigation	3	4	0	1	7	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	No mitigation is required due to the low risk of electrocution posed by the steel monopole double circuit structures							
	With Mitigation	3	4	0	1	7	Low	-	Medium
Electrocution of Red Data avifauna in the substation yard	Nature of impact:	Direct							
	Without Mitigation	3	4	0	1	7	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	he hardware within the substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied							
	With Mitigation	3	4	0	1	7	Low	-	Medium
	Nature of impact:	Not Applicable							

Physical disturbance of archaeological sites	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Physical disturbance of palaeontological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Intrusion on sense of place and rural landscape	Nature of impact:	Direct							
	Without Mitigation	2	5	2	2	18	Low	-	Medium
	degree to which impact can be reversed:	Low- The visual impact can be completely reversed after closure of facility, if power infrastructure is removed and vegetation rehabilitated.							
	degree of impact on irreplaceable resources:	Low-No impact on irreplaceable resource, if landforms remain unaffected as proposed.							
	Mitigation Measures	Natural Vegetation must be re-established on disturbed areas after construction. Roads should be appropriately stabilised to avoid erosion and visual scars. Ensure all structures are well maintained.							
	With Mitigation	2	5	2	2	18	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	2	5	2	3	27	Low	-	

Visual impact of transmission lines and power tower	degree to which impact can be reversed:	Low- The visual impact can be completely reversed after closure of facility, if power infrastructure is removed and vegetation rehabilitated.							
	degree of impact on irreplaceable resources:	Low-No impact on irreplaceable resource, if landforms remain unaffected as proposed.							
	Mitigation Measures	Natural Vegetation must be re-established on disturbed areas after construction. Roads should be appropriately stabilised to avoid erosion and visual scars. Ensure all structures are well maintained.							
	With Mitigation	2	5	2	3	27	Low	-	
Increased traffic generation around the study area by maintenance vehicles	Nature of impact:	Direct							
	Without Mitigation	2	1	2	2	10	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.							
	With Mitigation	2	1	2	2	10	Low	-	
Acoustic impact on residential receptors	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Change in sense of place	Nature of impact:	Direct							
	Without Mitigation	2	4	4	4	40	Medium	-	Medium
	degree to which impact can be reversed:	High - removal of the proposed infrastructure							

Change in sense of place	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Implementation of recommendations contained in the Visual Impact Assessment							
	With Mitigation	2	4	4	4	40	Medium	-	Medium
Evacuation of power	Nature of impact:	Direct							
	Without Mitigation	4	4	8	5	80	High	-	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation	4	4	8	5	80	High	-	Medium

Powerline - No-Go

Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase.	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low		
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low		

Previously disturbed areas will remain vulnerable to alien plant invasion for some time	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Maintenance of the existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	3	5	2	5	50	Medium	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
No infrastructure for the evacuation of power	Nature of impact:	Direct							
	Without Mitigation	4	5	8	5	85	High	-	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation	4	5	8	5	85	High		

BioTherm Energy - Esizayo Powerline

{insert specialist filed here}

Significance Rating Table

Decommissioning Phase									
Substation 1 Route Option 1- Powerline Alternative 1									
Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on	Low							

Increased potential of soil erosion	Mitigation Measures	Areas of disturbance should be (where practical) limited to the extent of the project footprint, and activities outside of the site should be kept to a minimum. Traffic from vehicles associated with the decommissioning should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. Long term soil stockpiles should be appropriately redistributed to the site to infill any excavations incurred during the decommissioning phase. Artificial erosion control measured should be removed to establish natural erosion conditions for the area. Although expected to be nominal in this area, the topsoil removed during the construction period is expected to have a higher fertility than the subsoil horizons. In addition, vegetation seeds are stored in the topsoil. As a result, the topsoil should be kept separate from the subsoils, and should be returned to the impacted land to reinstate the land capability, with topsoil being returned as the top layer. Soil compaction during reinstatement should be minimised to ensure infiltration representative of the regional soils is maintained							
	With Mitigation	1	2	2	2	10	Low	-	Medium
Potential spillage of hazardous substances such as oils, fuel, grease from construction vehicles, and sewage from on-site sanitation systems	Nature of impact:	Direct							
	Without Mitigation	2	2	2	2	12	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and							
	With Mitigation	1	2	0	1	3	Low	-	Medium
Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.							
	With Mitigation	2	1	2	2	10	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	2	3	4	4	36	Medium	-	

Temporary/ Permanent degradation of wetland/riparian habitat due to the proposed traversing powerlines	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.							
	With Mitigation	2	1	2	2	10	Low	-	Medium
Potential contamination of groundwater through	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• All equipment that has the potential to spill or leak must have a drip tray underneath at all times. • Adequate ablution facilities must be placed onsite. • All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.							
	With Mitigation	1	1	2	2	8	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							

Faunal impacts due to decommissioning of the wind farms	Mitigation Measures	• Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. • All above-ground infrastructure should be removed from the site. Below-ground infrastructure such as cabling can be left in place if it does not pose a risk, as removal of such cables may generate additional disturbance and impact.							
	With Mitigation	2	2	4	2	16	Low	-	
Soil Erosion follwing decommissioning	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.							
	With Mitigation	2	2	4	2	16	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	2	2	3	18	Low	-	Medium
	degree to which impact can be reversed:	Moderate							

Alien Plant Invasion following decommissioning	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned. • Regular monitoring for alien plants within the disturbed areas for at least two years after decommissioning. • Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.							
	With Mitigation	2	2	2	2	12	Low	-	
Displacement due to habitat destruction and disturbance associated with the de-commissioning of the powerlines	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	2	1	4	2	14	Low		
	Nature of impact:	Direct							
	Without Mitigation	1	1	4	3	18	Low	-	Medium
	degree to which impact can be reversed:	High							

Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decomissioning of the substation	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Decomissioning activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	1	1	2	3	12	Low	-	
Physical disturbance of archaeological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Physical disturbance of palaeontological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:	Direct							

Visual impact during decommissing due to dust, vehicles and equipment.	Without Mitigation	2	2	4	4	32	Medium	-	Medium- High
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Natural vegetation must be re-established on disturbed areas following decommissioning. The decommissioning footprint must be kept as small as possible. Dust and litter control measures must be included in the EMPr.							
	With Mitigation	2	2	2	3	18	Low	-	Medium
Increased traffic generation around the study area by vehicles associated with decommissioning.	Nature of impact:	Direct							
	Without Mitigation	2	1	2	3	15	Low	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road. • intersection warning signs should be erected either side of the access road in accordance with the requirements of the South African Road Traffic Signs Manual. • Vehicles associated with the decommissioning should only use the roads during the daylight hours. no construction vehicles should be operational from 6pm- 6am.							
	With Mitigation	2	1	2	2	10	Low	-	
Acoustic impact on residential receptors	Nature of impact:	Dircet							
	Without Mitigation	2	2	4	4	32	Medium	-	High
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							

	Mitigation Measures	• Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance. • When working near (within 500 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible. • Avoiding or minimizing project transportation through community areas.							
	With Mitigation	2	2	4	3	24	Low	-	High
Gain of short term employment	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly for semi- and unskilled opportunities.							
	With Mitigation	2	1	6	4	36	Medium	+	
Nuisance from noise, dust and traffic disturbances	Nature of impact:	Direct							
	Without Mitigation	2	1	4	4	28	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by relevant specialists and included in the EMPr							
	With Mitigation	2	1	4	3	21	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							

Increased risk to neighbouring land users	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor. Contractor to be held liable for compensating farmers for any loses and/or damage that can be linked to decommissioning workers.							
	With Mitigation	2	1	4	3	21	Low		
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
	Nature of impact:	Direct							
	Without Mitigation	3	5	2	5	50	Medium	-	Medium

Loss of employment and local economic development opportunities	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	3	2	2	5	35	Medium	-	
Maintenance of existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	-	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	2	5	2	5	45	Medium	-	

BioTherm Energy - Esizayo Powerline

Impacts Identified in the BAR

Significance Rating Table

Construction Phase

Alternative 2 (Substation 1, Route Option 2)

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology for the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
Disturbance to underlying geology for the construction of the Substation	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
	Nature of impact:	Dircet							
	Without Mitigation	2	2	4	5	40	Medium	-	Medium

Reduction in land availaibility for grazing animals due to the land being occupied by the transmission and substation infrastructure	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum.							
	With Mitigation	1	2	2	4	20	Low	-	Medium
Increased potential for soil erosion due to vegetation clearance, soil disturbance and a high traffic movement onsite.	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum. Traffic of construction vehicles should be kept to a minimum to reduce soil							
	With Mitigation	1	2	2	2	10	Low	-	Medium
Potential spillage of hazardous substances such as oils, fuel, grease from construction vehicles, and sewage from on-site sanitation systems	Nature of impact:	Direct							
	Without Mitigation	2	2	2	2	12	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and proper							
	With Mitigation	1	2	0	1	3	Low	-	Medium
Alterations of flow regimes of watercourses, in close	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	High							

proximity to the site, or that is proposed to be traversed.	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Construction of the powerlines should occur during the dry season and the site rehabilitated before major rainfall events occur. Powerlines must only cross perpendicular to a watercourse and the chosen alignment must							
	With Mitigation	2	2	2	3	18	Low	-	Medium
Temporary degradation of wetland/riparian habitat due to the proposedproposed positioning of the powerlines and pylons	Nature of impact:	Direct							
	Without Mitigation	2	2	6	5	50	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The WULA application will require detailed functional assessments (i.e. PES, EIS and EcoServices) of freshwater habitats potentially affected by the site and powerlines. At this stage design details should be available allowing the freshwater specialist to assess specific areas within the site. Therefore, a more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in terms of pylon positions in relation to freshwater habitats. A freshwater habitat specialist be present onsite during the construction phase of the project, and conduct an in-depth site walkover prior to any site work to assess the area for any wetlands and watercourses which may be affected by the actions conducted during the construction phase.							
	With Mitigation	1	2	4	3	21	Low	-	Medium
Potential contamination of groundwater through	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• All equipment that has the potential to spill or leak must have a drip tray underneath at all times. • Cement must be mixed on an impermeable surface and not on the bare ground.							
	With Mitigation	1	1	2	2	8	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	Medium

Impacts on vegetation and protected plant species	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable	Moderate							
	Mitigation Measures	• Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. • Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. • Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. • All roads built for construction should have water diversion and erosion control structures present, especially in steep areas. • Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. • Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to avoid using material that might entangle fauna.							
	With Mitigation	2	1	4	2	14	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							

Impacts on Fauna due to constructtion activities	Mitigation Measures	• Preconstruction walk-through of the power line to identify areas of faunal sensitivity. • During construction any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. • The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. • No fires should be allowed within the site as there is a risk of runaway veld fires. • No fuelwood collection should be allowed on-site. • No dogs or cats should be allowed on site apart from that of the landowners. • If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • No unauthorized persons should be allowed onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel.							
	With Mitigation	1	2	2	3	15	Low	-	Medium
Increased Soil Erosion risk during construction	Nature of impact:	Direct							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Runoff management and erosion control should be integrated into the project design. • Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. • Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. • Regular monitoring for erosion problems along the access roads and other cleared areas. • Erosion problems should be rectified on a regular basis. • Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season. • A low cover of vegetation should be left wherever possible within the construction footprint to bind the soil, prevent erosion and promote post-disturbance recovery of an indigenous ground cover.							
	With Mitigation	2	2	2	3	18	Low	-	Medium

Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	2	1	8	3	33	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	2	1	4	2	14	Low	-	Medium
Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation	Nature of impact:	Direct							
	Without Mitigation	1	1	4	3	18	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	1	1	2	3	12	Low	-	
	Nature of impact:	Direct							

Physical disturbance of archaeological sites during the construction of the powerlines	Without Mitigation	4	5	8	2	34	Medium	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• A 20m buffer must be placed around the colonel ruins idenitified at Substation 1 and must be declared a “No-Go” area; • If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified; • If any human remains are uncovered during the excavations for pylons, work must stop in that area and HWC must be alerted immediately							
	With Mitigation	4	5	6	1	15	Low	-	
Vandalism of Heritage items	Nature of impact:	Indirect							
	Without Mitigation	4	5	6	3	45	Medium	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The rock art site next to the R354 must be protected from vandalism, either by a temporary fence during construction, or else by supervision of construction staff. Alternatively, use the other line options.							
	With Mitigation	4	5	6	1	15	Low	-	Medium
Physical disturbance of archaeological sites during	Nature of impact:	Direct							
	Without Mitigation	4	5	8	4	68	High	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Moderate							

the construction of Substation 1	Mitigation Measures	• The proposed location of substation 1 needs to be shifted to prevent any damage to the colonel ruins; • A 20m buffer must be placed around the colonel ruins identified at Substation 1 and must be declared a "No-Go" area; • If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified; • If any human remains are uncovered during the excavations for pylons, work must stop in that area and HWC must be alerted immediately.							
	With Mitigation	4	5	6	1	15	Low	-	Medium
Physical disturbance of palaeontological sites	Nature of impact:	Direct							
	Without Mitigation	1	5	2	2	16	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Monitoring of all surface clearances and substantial excavations (>1m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. • Safeguarding of chance fossil finds (preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape. • Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with the pertinent contextual data. • Curation of fossil material within an approved repository by a qualified palaeontologist.							
	With Mitigation	1	5	2	1	8	Low	-	Medium
Visual impact during construction due to dust,	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium- High
	degree to which impact can be reversed:	High- The visual impact can be completely reversed if vehicles, equipment, rubble and any other construction materials are removed after construction.							
	degree of impact on irreplaceable resources:	Low- Dust and equipment are not likely to impact on any irreplaceable visual resources.							

vehicles and equipment	Mitigation Measures	• The handling and transportation of materials which may generate dust must be avoided during high wind conditions. • The building site and construction facilities must be well maintained and strictly controlled. • Dust and Litter control measures must be included in the EMPr.							
	With Mitigation	2	2	4	3	24	Low	-	Medium- High
Visual impact during construction due to vegetation clearing	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium- High
	degree to which impact can be reversed:	High- The visual impact can becompletely reversed, if vegetation is rehabilitated.							
	degree of impact on irreplaceable resources:	Low- From a visual perspective can be re-established.							
	Mitigation Measures	• The construction footprint must be kept as small as possibke, to avoid unneccessary disruption to the existing vegetation.							
	With Mitigation	2	2	2	4	24	Low	-	Medium- High
Increased traffic generation around the study area by construction vehicles-	Nature of impact:	Direct							
	Without Mitigation	2	1	2	3	15	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.							
	With Mitigation	2	1	2	2	10	Low	-	
Acoustic impact on	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	High
	degree to which impact can be reversed:	High							

residential receptors	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	• Planning construction activities in consultation with local communities so that activities witj the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance.							
	With Mitigation	2	2	4	3	24	Low	-	High
Increase in employment opportunities	Nature of impact:	Direct							
	Without Mitigation	3	2	4	3	27	Low	+	Medium
	degree to which impact can be reversed:	None							
	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly semi-skilled and unskilled opportunities;							
	With Mitigation	3	2	4	4	36	Medium	+	Medium
Disruption through influx of job seeks	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control influx of job seekers and associated local impacts							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Manage employment expectations as far as possible, prioritise local employment, engage with local municipality in respect of accommodation of labour / staff brought into the area by contractors/developer							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Increase in communicable diseases and reduced public health	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control communicable disease which could permanently impact local populations							
	degree of impact on irreplaceable resources:	High							

	Mitigation Measures	Development of a labour force Health and Safety Plan, HIV/AIDS awareness, prevention and testing campaign							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Nuisance from noise, dust and traffic disturbances	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Medium - implementation of EMPr measures to reduce noise, dust and traffic related impacts, but unlikely to negate completely							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by the relevant specialists and included in the EMPr							
	With Mitigation	2	2	2	2	12	Low	-	Medium
Increased risk to neighbouring land users	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	High - provision of compensation to farmers for damage to infrastructure, stock theft, etc.							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Development of a code of conduct for construction workers, to be signed by the contractor; Contractor to be held liable for compensating farmers for any losses and/or damage that can be linked to construction workers							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Increased risk of veld fires	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium
	degree to which impact can be reversed:	High - provision of compensation to farmers for losses resulting from veld fires							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Implementation of EMPr i.e. mitigation in respect of construction phase activities that may pose a fire risk (i.e. no open fires allows on site for cooking/heating; activities that pose a fire risk to be property managed and confined to designated areas; adequate fire-fighting equipment and necessary training to be provided)							

	With Mitigation	2	2	4	3	24	Low	-	Medium
Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Impacts on vegetation and protected plant species	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Faunal impacts due to construction activities	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Increased Soil Erosion risk during construction	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
	Nature of impact:	Direct							
	Without Mitigation								

The no-go option will result in no additional impacts on avifauna and will maintain the current ecological integrity	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Loss of employment and local economic development	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	-	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	3	5	2	5	50	Medium	-	Medium
Maintenance of the existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	+	
	degree to which impact can be reversed:	Direct							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	2	5	2	5	45	Medium	+	Medium

BioTherm Energy - Esizayo Powerline

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Significance Rating Table

Operational Phase

Substation 1 Route Option 2- Powerline Alternative 2

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Reduction in land availaibility for grazing animals due to theland being occupied by the transmission and substation infrastructure	Nature of impact:	Direct							
	Without Mitigation	2	4	4	5	50	Medium	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Powerline and substation Infrastructure should be limited to the extent of the project footprint, and activities outside of the site should be kept to a minimum.							
	With Mitigation	1	4	0	1	5	Low	-	Medium
	Nature of impact:	Direct							

Vegetation cleared for powerlines and substation, soil disturbance and stockpiles, and increased traffic movement on site, resulting in a higher potential for soil erosion.	Without Mitigation	2	4	4	3	30	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Traffic of maintenace vehicles should be kept to a minimum to reduce soil compaction, and limited to existing or proposed roadways where practical.							
	With Mitigation	1	4	2	2	14	Low	-	Medium
Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles.	Nature of impact:	Direct							
	Without Mitigation	2	4	2	2	16	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and							
	With Mitigation	1	4	0	1	5	Low	-	Medium
Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Nature of impact:	Direct							
	Without Mitigation	2	5	8	4	60	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Powerlines must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to restrict the number of pylons within a system (which should be avoided as far as possible). The proposed powerlines and pylons should be positioned above the 1:100 floodline of any watercourse.							
	With Mitigation	2	1	2	2	10	Low	-	Medium
	Nature of impact:	Direct							

Permanent degradation of wetland/riparian habitat due to the proposedproposed positioning of the powerlines and pylons	Without Mitigation	2	2	8	5	60	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	he proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and proper upkeep of machinery and vehicles.							
	With Mitigation	1	4	0	1	5	Low	-	Medium
Potential contamination of groundwater through leaks or spills of oil, grease or fuel.	Nature of impact:	Direct							
	Without Mitigation	2	4	2	3	24	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	All equipment that has the potential to leak oil or fuel must be placed under a drip tray. Vehicles associated with the maintenace activities are to be serviced and kept in good working order.							
	With Mitigation	1	5	0	2	12	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	1	5	4	3	30	Low	-	Medium
	degree to which impact can be reversed:	Moderate							

Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Erosion management at the site should take place according to the Erosion and Rehabilitation Plan. • All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques.							
	With Mitigation	1	5	4	2	20	Low	-	Medium
Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Nature of impact:	Direct							
	Without Mitigation	1	5	4	3	30	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. • Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. • Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.							
	With Mitigation	2	2	4	3	24	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	2	4	4	3	30	Low	-	Medium

Previously disturbed areas will remain vulnerable to alien plant invasion for some time	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. • Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. • Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use							
	With Mitigation	1	4	2	2	14	Low	-	Medium
Collisions of Red Data avifauna with the earthwire of the proposed 132kV powerlines	Nature of impact:	Direct							
	Without Mitigation	3	4	10	2	34	Medium	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	• A walk-through must be conducted by the avifaunal specialist after final pole positions have been determined, to demarcate sections of line that will need to be mitigated with Bird Flight Diverters (BFDs).							
	With Mitigation	3	4	10	1	17	Low	-	Medium
Electrocution of Red Data avifauna	Nature of impact:	Direct							
	Without Mitigation	3	4	0	1	7	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							

	Mitigation Measures	No mitigation is required due to the low risk of electrocution posed by the steel monopole double circuit structures							
	With Mitigation	3	4	0	1	7	Low	-	Medium
Electrocution of Red Data avifauna in the substation yard	Nature of impact:	Direct							
	Without Mitigation	3	4	0	1	7	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The hardware within the substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied							
	With Mitigation	3	4	0	1	7	Low	-	Medium
Physical disturbance of archaeological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Physical disturbance of palaeontological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								

	Mitigation Measures								
	With Mitigation								
Intrusion on sense of place and rural landscape	Nature of impact:	Direct							
	Without Mitigation	2	5	2	2	18	Low	-	Medium
	degree to which impact can be reversed:	Low- The visual impact can be completely reversed after closure of facility, if towers removed.							
	degree of impact on irreplaceable resources:	Low- No impact on irreplaceable resource, if landforms remain unaffected as proposed.							
	Mitigation Measures	Natural Vegetation must be re-established on disturbed areas after construction. Roads should be appropriately stabilised to avoid erosion and visual scars. Ensure all structures are well maintained.							
	With Mitigation	2	5	2	2	18	Low	-	Medium
Visual impact of transmission lines and power tower	Nature of impact:	Direct							
	Without Mitigation	2	5	2	3	27	Low		Medium
	degree to which impact can be reversed:	Low- The visual impact can be completely reversed after closure of facility, if towers removed.							
	degree of impact on irreplaceable resources:	Low- No impact on irreplaceable resource, if landforms remain unaffected as proposed.							
	Mitigation Measures	Natural Vegetation must be re-established on disturbed areas after construction. Roads should be appropriately stabilised to avoid erosion and visual scars. Ensure all structures are well maintained.							
	With Mitigation	2	5	2	3	27	Low	-	Medium
Increased traffic generation around the study area by maintenance vehicles	Nature of impact:	Direct							
	Without Mitigation	2	1	2	2	10	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.							
	With Mitigation	2	1	2	1	5	Low	-	
	Nature of impact:	Not Applicable							

Acoustic impact on residential receptors	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Change in sense of place	Nature of impact:	Direct							
	Without Mitigation	2	4	4	4	40	Medium	-	Medium
	degree to which impact can be reversed:	High - removal of the proposed infrastructure							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Implementation of recommendations contained in the Visual Impact Assessment							
	With Mitigation	2	4	4	4	40	Medium	-	Medium
Evacuation of power	Nature of impact:	Direct							
	Without Mitigation	4	4	8	5	80	High	-	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation	4	4	8	5	80	High	-	Medium

Powerline - No-Go								
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)	Status (+ve or -ve)	Confidence

Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase.	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low		
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low		
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Maintenance of the existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	3	5	2	5	50	Medium	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
	Nature of impact:	Direct							
	Without Mitigation	4	5	8	5	85	High	-	Medium

No infrastructure for the evacuation of power	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation	4	5	8	5	85	High		

BioTherm Energy - Esizayo Powerline

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Significance Rating Table

Decommissioning Phase

Substation 1 Route Option 2- Powerline Alternative 2 (Preferred Alternative)

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Increased potential of soil erosion	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of disturbance should be (where practical) limited to the extent of the project footprint, and activities outside of the site should be kept to a minimum. Traffic of de-construction vehicles should be kept to a minimum to reduce soil compaction, and limited to existing roadways where practical. Long term soil stockpiles should be							
	With Mitigation	1	2	2	2	10	Low	-	
	Nature of impact:	Direct							

Potential spillage of hazardous substances such as oils, fuel, grease from construction vehicles, and sewage from on-site sanitation systems	Without Mitigation	2	2	2	2	12	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and							
	With Mitigation	1	2	0	1	3	Low	-	
Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Nature of impact:	Direct							
	Without Mitigation	2	3	6	5	55	Medium	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.							
	With Mitigation	2	1	2	2	10	Low	-	
Temporary/ Permanent degradation of wetland/riparian habitat due to the proposed traversing powerlines	Nature of impact:	Direct							
	Without Mitigation	2	3	6	5	55	Medium	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.							
	With Mitigation								
	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	

Potential contamination of groundwater through	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• All equipment that has the potential to spill or leak must have a drip tray underneath at all times. • Adequate ablution facilities must be placed onsite. • All hazardous chemicals and materials must be stored within a lockable area on an impermeable surface.							
	With Mitigation								
Faunal impacts due to decommissioning of the wind farms	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location.							
	With Mitigation	2	2	4	2	16	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							

Soil Erosion follwing decommissioning	Mitigation Measures	• Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.							
	With Mitigation	2	2	4	2	16	Low	-	
Alien Plant Invasion following decommissioning	Nature of impact:	Direct							
	Without Mitigation	2	2	2	3	18	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site alien plant species are likely to be a long-term problem at the site following decommissioning and regular control will need to be implemented until a cover of indigenous species has returned. • Regular monitoring for alien plants within the disturbed areas for at least two years after decommissioning. • Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible.							
	With Mitigation	2	2	2	2	12	Low	-	
Displacement due to habitat destruction and disturbance associated	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							High

disturbance associated with the de-commissioning of the powerlines	degree of impact on irreplaceable resources:	Low							High
	Mitigation Measures	• Activity should be restricted to the immediate footprint of the infrastructure.							
	With Mitigation	2	1	4	2	14	Low		Medium
Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decomissioning of the substation	Nature of impact:	Direct							
	Without Mitigation	1	1	4	3	18	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Decomissioning activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority							
	With Mitigation	1	1	2	3	12	Low	-	
Physical disturbance of archaeological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Physical disturbance of palaeontological site	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								

	Mitigation Measures								
	With Mitigation								
Visual impact during decommissionig due to dust, vehicles and equipment	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Natural vegetation must be re-established on disturbed areas following decommissioning. The decommissioning footprint must be kept as small as possible. Dust and litter control measures must be included in the EMPr.							
	With Mitigation	2	2	2	3	18	Low	-	
Increased traffic generation around the study area by vehicles associated with decommissioning.	Nature of impact:	Direct							
	Without Mitigation	2	1	2	3	15	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.							
	With Mitigation	2	1	2	2	10	Low	-	
Acoustic impact on residential receptors	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	High
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance.							
	With Mitigation	2	2	4	3	24	Low	-	

Gain of short term employment	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly for semi- and unskilled opportunities.							
	With Mitigation	2	1	6	4	36	Medium	+	
Nuisance from noise, dust and traffic disturbances	Nature of impact:	Direct							
	Without Mitigation	2	1	4	4	28	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by relevant specialists and included in the EMPr							
	With Mitigation	2	1	4	3	21	Low	-	
Increased risk to neighbouring land users	Nature of impact:	Indirect							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor. Contractor to be held liable for compensating farmers for any loses and/or damage that can be linked to							
	With Mitigation	2	1	4	3	21	Low		
Powerline - No-Go									
Potential Impact	Mitigation	Extent	Duration	Magnitude	Probability	Significance		Status	Confidence

Potential Impact	Mitigation	(E)	(D)	(M)	(P)	(S=(E+D+M)*P)		(+ve or -ve)	Confidence
Loss of employment and local economic development opportunities	Nature of impact:	Direct							
	Without Mitigation	3	5	2	5	50	Medium	-	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	3	2	2	5	35	Medium	-	
Maintenance of existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	-	Medium
	degree to which	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	2	5	2	5	45	Medium	-	

BioTherm Energy - Esizayo Powerline

Impacts Identified in the BAR

Significance Rating Table

Construction Phase

Alternative 3 (Substation 2, Route Option 1)

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology for the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
Disturbance to underlying geology for the construction of the Substation	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
	Nature of impact:	Dircet							
	Without Mitigation	2	2	4	5	40	Medium	-	Medium

Reduction in land availaibility for grazing animals due to the land being occupied by the transmission and substation infrastructure	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum.							
	With Mitigation	1	2	2	4	20	Low	-	Medium
Increased potential for soil erosion due to vegetation clearance, soil disturbance and a high traffic movement onsite.	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum. Traffic of construction vehicles should be kept to a minimum to reduce soil							
	With Mitigation	1	2	2	2	10	Low	-	Medium
Potential spillage of hazardous substances such as oils, fuel, grease from construction vehicles, and sewage from on-site sanitation systems	Nature of impact:	Direct							
	Without Mitigation	2	2	2	2	12	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and proper							
	With Mitigation	1	2	0	1	3	Low	-	Medium
Alterations of flow regimes of watercourses, in close	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	High							

proximity to the site, or that is proposed to be traversed.	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Construction of the powerlines should occur during the dry season and the site rehabilitated before major rainfall events occur. Powerlines must only cross perpendicular to a watercourse and the chosen alignment must							
	With Mitigation	2	2	2	3	18	Low	-	Medium
Temporary degradation of wetland/riparian habitat due to the proposedproposed positioning of the powerlines and pylons	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in							
	With Mitigation	1	2	4	3	21	Low	-	Medium
Potential contamination of groundwater through	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• All equipment that has the potential to spill or leak must have a drip tray underneath at all times. • Cement must be mixed on an impermeable surface and not on the bare ground.							
	With Mitigation	1	1	2	2	8	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	2	8	4	48	Medium	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							

Impacts on vegetation and protected plant species	Mitigation Measures	• Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. • Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. • Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. • All roads built for construction should have water diversion and erosion control structures present, especially in steep areas. • Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. • Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to avoid using material that might entangle fauna.							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Impacts on Fauna due to constructtion activities	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. • No fires should be allowed within the site as there is a risk of runaway veld fires. • No fuelwood collection should be allowed on-site. • No dogs or cats should be allowed on site apart from that of the landowners. • If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • No unauthorized persons should be allowed onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel.							
	With Mitigation	1	2	2	3	15	Low	-	Medium

Increased Soil Erosion risk during construction	Nature of impact:	Direct							
	Without Mitigation	2	2	8	4	48	Medium	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Runoff management and erosion control should be integrated into the project design. • Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. • Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. • Regular monitoring for erosion problems along the access roads and other cleared areas. • Erosion problems should be rectified on a regular basis. • Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season. • A low cover of vegetation should be left wherever possible within the construction footprint to bind the soil, prevent erosion and promote post-disturbance recovery of an indigenous ground cover.							
	With Mitigation	2	2	2	3	18	Low	-	Medium
Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	2	1	4	2	14	Low	-	Medium

Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation	Nature of impact:	Direct							
	Without Mitigation	1	1	4	3	18	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	1	1	2	3	12	Low	-	Medium
Physical disturbance of archaeological sites during the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	4	5	4	2	26	Low	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	• A 20m buffer must be placed around the colonel ruins idenitified at Substation 1 and must be declared a “No-Go” area; • If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified; • If any human remains are uncovered during the excavations for pylons, work must stop in that area and HWC must be alerted immediately							
	With Mitigation	4	5	4	1	13	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	4	5	4	2	26	Low	-	Medium

Physical disturbance of archaeological sites during the construction of Substation 1	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	• A 20m buffer must be placed around the colonel ruins idenitified at Substation 1 and must be declared a “No-Go” area; • If any high concentrations of archaeological material, such as stone artefacts are recovered, HWC must be notified; • If any human remains are uncovered during the excavations for pylons, work must stop in that area and HWC must be alerted immediately.							
	With Mitigation	4	5	4	1	13	Low	-	Medium
Physical disturbance of palaeontological sites	Nature of impact:	Direct							
	Without Mitigation	1	5	2	2	16	Low	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Monitoring of all surface clearances and substantial excavations (>1m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase. • Safeguarding of chance fossil finds (preferably in situ) during the construction phase by the responsible ECO, followed by reporting of finds to Heritage Western Cape. • Recording and judicious sampling of significant chance fossil finds by a qualified palaeontologist, together with the pertinent contextual data. • Curation of fossil material within an approved repository by a qualified palaeontologist.							
	With Mitigation	1	5	2	1	8	Low	-	Medium
Visual impact during construction due to dust, vehicles and equipment	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium- High
	degree to which impact can be reversed:	High- The visual impact can be completely reversed if vehicles, equipment, rubble and any other construction materials are removed after construction.							
	degree of impact on irreplaceable resources:	Low- Dust and equipment are not likely to impact on any irreplaceable visual resources.							

vehicles and equipment	Mitigation Measures	• The handling and transportation of materials which may generate dust must be avoided during high wind conditions. • The building site and construction facilities must be well maintained and strictly controlled. • Dust and Litter control measures must be included in the EMPr.							
	With Mitigation	2	2	2	3	18	Low	-	Medium- High
Visual impact during construction due to vegetation clearing	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium- High
	degree to which impact can be reversed:	High- The visual impact can be completely reversed, if vegetation is rehabilitated.							
	degree of impact on irreplaceable resources:	Low- From a visual perspective can be re-established.							
	Mitigation Measures	• The construction footprint must be kept as small as possibke, to avoid unneccessary disruption to the existing vegetation. • No blanket clearing or removal of vegetation outside of the building zone is allowed.							
	With Mitigation	2	2	2	3	18	Low	-	Medium- High
Increased traffic generation around the study area by construction vehicles-	Nature of impact:	Direct							
	Without Mitigation	2	1	2	3	15	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.							
	With Mitigation	2	1	2	2	10	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	High

Acoustic impact on residential receptors	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	• Planning construction activities in consultation with local communities so that activities witj the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance.							
	With Mitigation	2	2	4	3	24	Low	-	High
Increase in employment opportunities	Nature of impact:	Direct							
	Without Mitigation	3	2	4	3	27	Low	+	Medium
	degree to which impact can be reversed:	None							
	degree of impact on irreplaceable resources:	None							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly semi-skilled and unskilled opportunities;							
	With Mitigation	3	2	4	4	36	Medium	+	Medium
Disruption through influx of job seeks	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control influx of job seekers and associated local impacts							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Manage employment expectations as far as possible, prioritise local employment, engage with local municipality in respect of accommodation of labour / staff brought into the area by contractors/developer							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Increase in communicable diseases and reduced public health	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control communicable disease which could permanently impact local populations							
	degree of impact on irreplaceable	High							

	Mitigation Measures	Development of a labour force Health and Safety Plan, HIV/AIDS awareness, prevention and testing campaign							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Nuisance from noise, dust and traffic disturbances	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Medium - implementation of EMPr measures to reduce noise, dust and traffic related impacts, but unlikely to negate completely							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by the relevant specialists and included in the EMPr							
	With Mitigation	2	2	2	2	12	Low	-	Medium
Increased risk to neighbouring land users	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	High - provision of compensation to farmers for damage to infrastructure, stock theft, etc.							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	Development of a code of conduct for construction workers, to be signed by the contractor; Contractor to be held liable for compensating farmers for any losses and/or damage that can be linked to construction workers							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Increased risk of veld fires	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium
	degree to which impact can be reversed:	High - provision of compensation to farmers for losses resulting from veld fires							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	Implementation of EMPr i.e. mitigation in respect of construction phase activities that may pose a fire risk (i.e. no open fires allows on site for cooking/heating; activities that pose a fire risk to be property managed and confined to							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Impacts on vegetation and	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which	N/A							

Impacts on vegetation and protected plant species	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Faunal impacts due to construction activities	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Increased Soil Erosion risk during construction	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
The no-go option will result in no additional impacts on avifauna and will maintain the current ecological integrity	Nature of impact:	Direct							
	Without Mitigation								
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Loss of employment and	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	-	Medium
	degree to which impact can be	N/A							

local economic development	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	3	5	2	5	50	Medium	-	Medium
Maintenance of the existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	+	
	degree to which impact can be	Direct							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	2	5	2	5	45	Medium	+	Medium

BioTherm Energy - Esizayo Powerline

{insert specialist filed here}

Significance Rating Table

Operational Phase

Substation 2 Route Option 1- Alternative 3

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Reduction in land availaibility for grazing animals due to theland being occupied by the transmission and substation infrastructure	Nature of impact:	Direct							
	Without Mitigation	2	4	4	5	50	Medium	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Powerline and substation Infrastructure should be limited to the extent of the project footprint, and activities outside of the site should be kept to a minimum.							
	With Mitigation	1	4	2	3	21	Low	-	Medium
	Nature of impact:	Direct							

Vegetation cleared for powerlines and substation, soil disturbance and stockpiles, and increased traffic movement on site, resulting in a higher potential for soil erosion.	Without Mitigation	2	4	4	3	30	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Traffic of maintenace vehicles should be kept to a minimum to reduce soil compaction, and limited to existing or proposed roadways where practical.							
	With Mitigation	1	4	2	3	21	Low	-	Medium
Potential spillage of hazardous substances such as oils, fuel, grease from maintenance vehicles.	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Nature of impact:	Direct							
	Without Mitigation	2	5	8	4	60	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	owerlines must only cross perpendicular to a watercourse and the chosen alignment must endeavour that the span across the watercourse is minimalised to restrict the number of pylons within a system (which should be avoided as far as possible). The proposed powerlines and pylons should be positioned above the 1:100 floodline of any watercourse.							

	With Mitigation	2	1	2	2	10	Low	-	Medium
Permanent degradation of wetland/riparian habitat due to the proposedproposed positioning of the powerlines and pylons	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Potential contamination of groundwater through leaks or spills of oil, grease or fuel.	Nature of impact:	Direct							
	Without Mitigation	2	5	2	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	All equipment that has the potential to leak oil or fuel must be placed under a drip tray. Vehicles associated with the maintenace activities are to be serviced and kept in good working order.							
	With Mitigation	1	5	0	2	12	Low	-	
Previously disturbed areas will remain vulnerable to	Nature of impact:	Direct							
	Without Mitigation	2	5	4	3	33	Medium	-	
	degree to which impact can be reversed:	Moderate							

erosion for some time into the operational phase	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Erosion management at the site should take place according to the Erosion and Rehabilitation Plan. • All roads and other hardened surfaces should have runoff control features which redirect water flow and							
	With Mitigation	2	2	4	3	24	Low	-	
Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Nature of impact:	Direct							
	Without Mitigation	2	4	4	3	30	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. • Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem woody species such as Prosopis are already present in the area and are likely to increase rapidly if not controlled. • Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. • Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use							
	With Mitigation	1	4	2	2	14	Low		
Collisions with the earthwire of the proposed 132kV powerlines	Nature of impact:	Negative							
	Without Mitigation	3	4	10	4	68	High	-	Medium
	degree to which impact can be reversed:	Low							Medium
	degree of impact on irreplaceable resources:	High							Medium
	Mitigation Measures	• A walk-through must be conducted by the avifaunal specialist after final pole positions have been determined, to demarcate sections of line that will need to be mitigated with Bird Flight Diverters (BFDs).							Medium
	With Mitigation	3	4	10	3	51	Medium		Medium
	Nature of impact:	Negative							

Electrocution of Red Data avifauna	Without Mitigation	3	4	0	1	7	Low		High
	degree to which impact can be reversed:	High							High
	degree of impact on irreplaceable resources:	Low							High
	Mitigation Measures	No mitigation is required due to the low risk of electrocution posed by the steel monopole double circuit structures							High
	With Mitigation	3	4	0	1	7	Low		High
Electrocution of Red Data avifauna in the substation yard	Nature of impact:	Negative							
	Without Mitigation	3	4	0	1	7	Low		High
	degree to which impact can be reversed:	High							High
	degree of impact on irreplaceable resources:	Low							High
	Mitigation Measures	The hardware within the substation yard is too complex to warrant any mitigation for electrocution at this stage. It is recommended that if on-going impacts are recorded once operational, site specific mitigation be applied							High
	With Mitigation	3	4	0	1	7	Low		High
Physical disturbance of archaeological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:	Not Applicable							
	Without Mitigation								

Physical disturbance of palaeontological sites	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Intrusion on sense of place and rural landscape	Nature of impact:	Direct							
	Without Mitigation	2	5	4	2	22	Low	-	Medium
	degree to which impact can be reversed:	Low- The visual impact can be completely reversed after closure of facility, if power infrastructure is removed and vegetation rehabilitated.							
	degree of impact on irreplaceable resources:	Low- No impact on irreplaceable resource, if landforms remain unaffected as proposed.							
	Mitigation Measures	Natural Vegetation must be re-established on disturbed areas after construction. Roads should be appropriately stabilised to avoid erosion and visual scars. Ensure all structures are well maintained.							
	With Mitigation	2	5	4	2	22	Low	-	Medium
Visual impact of transmission lines and power tower	Nature of impact:	Direct							
	Without Mitigation	2	5	4	3	33	Medium	-	Medium
	degree to which impact can be reversed:	Low- The visual impact can be completely reversed after closure of facility, if power infrastructure is removed and vegetation rehabilitated.							
	degree of impact on irreplaceable resources:	Low- No impact on irreplaceable resource, if landforms remain unaffected as proposed.							
	Mitigation Measures	Natural Vegetation must be re-established on disturbed areas after construction. Roads should be appropriately stabilised to avoid erosion and visual scars. Ensure all structures are well maintained.							
	With Mitigation	2	5	4	3	33	Medium	-	Medium
Increased traffic generation around the	Nature of impact:	Direct							
	Without Mitigation	2	1	2	2	10	Low	-	
	degree to which impact can be reversed:	Low							

study area by maintenance vehicles	degree of impact on irreplaceable resources:	Low								
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.								
	With Mitigation	2	1	2	1	5	Low	-		
Acoustic impact on residential receptors	Nature of impact:	Not Applicable								
	Without Mitigation									
	degree to which impact can be reversed:									
	degree of impact on irreplaceable resources:									
	Mitigation Measures									
	With Mitigation									
Change in sense of place	Nature of impact:	Direct								
	Without Mitigation	2	4	4	4	40	Medium	-	Medium	
	degree to which impact can be reversed:	High - removal of the proposed infrastructure								
	degree of impact on irreplaceable resources:	Low								
	Mitigation Measures	Implementation of recommendations contained in the Visual Impact Assessment								
	With Mitigation	2	4	4	4	40	Medium	-	Medium	
Evacuation of power	Nature of impact:	Direct								
	Without Mitigation	4	4	8	5	80	High	-	Medium	
	degree to which impact can be reversed:	N/A								
	degree of impact on irreplaceable resources:	N/A								

	Mitigation Measures	N/A							
	With Mitigation	4	4	8	5	80	High	-	Medium
Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Previously disturbed areas will remain vulnerable to erosion for some time into the operational phase.	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low		
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Previously disturbed areas will remain vulnerable to alien plant invasion for some time	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low		
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Maintenance of the existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	3	5	2	5	50	Medium	+	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							

	Mitigation Measures	N/A							
	With Mitigation								
No infrastructure for the evacuation of power	Nature of impact:	Direct							
	Without Mitigation	4	5	8	5	85	High	-	Medium
	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation	4	5	8	5	85	High		

BioTherm Energy - Esizayo Powerline

{insert specialist filed here}

Significance Rating Table

Decommissioning Phase

Substation 1 Route Option 2- Powerline Alternative 3

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Increased potential of soil erosion	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of disturbance should be (where practical) limited to the extent of the project footprint, and activities outside of the site should be kept to a minimum. Traffic of de-construction vehicles should be kept to a minimum							
	With Mitigation	1	2	2	2	10	Low	-	
	Nature of impact:	Direct							

Potential spillage of hazardous substances such as oils, fuel, grease from construction vehicles, and sewage from on-site sanitation systems	Without Mitigation	2	2	2	2	12	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and							
	With Mitigation	1	2	0	1	3	Low	-	
Alterations of flow regimes of watercourses, in close proximity to the site, or that is proposed to be traversed.	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.							
	With Mitigation								
Temporary/ Permanent degradation of wetland/riparian habitat due to the proposed traversing powerlines	Nature of impact:	Direct							
	Without Mitigation	2	3	4	4	36	Medium		
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	After the decommissioning, rehabilitation of the site must occur immediately to ensure no residual impacts remain. A rehabilitation specialist must compile the rehabilitation plan and monitoring its implementation.							
	With Mitigation	2	1	2	2	10	Low	-	
	Nature of impact:	Direct							
	Without Mitigation								

Increased potential of soil erosion due to removal of powerlines and substations, soil disturbance and a high traffic movement on site.	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Potential contamination of groundwater	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• All equipment that has the potential to spill or leak must have a drip tray underneath at all times. • Adequate ablution facilities must be placed onsite.							
	With Mitigation	1	1	2	2	8	Low	-	
Faunal impacts due to decommissioning of the wind farms	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Any potentially dangerous fauna such snakes or fauna threatened by the decommissioning activities should be removed to a safe location.							
	With Mitigation	2	2	4	2	16	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium
	degree to which impact can be reversed:	Moderate							

Soil erosion following the decommissining	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Any roads that will not be rehabilitated should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • There should be regular monitoring for erosion for at least 2 years after decommissioning by the applicant to ensure that no erosion problems develop as result of the disturbance, and if they do, to immediately implement erosion control measures. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • All disturbed and cleared areas should be revegetated with indigenous perennial shrubs and grasses from the local area.							
	With Mitigation	2	2	4	2	16	Low	-	
Alien Plant Invasion following decommissioning	Nature of impact:	Direct							
	Without Mitigation	2	2	2	3	18	Low	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Wherever excavation is necessary for decommissioning, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species.							
	With Mitigation	2	2	2	2	12	Low	-	
Displacement due to habitat destruction and disturbance associated with the de-commissioning of the powerlines	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							High
	degree of impact on irreplaceable resources:	Low							High
	Mitigation Measures	• Activity should be restricted to the immediate footprint of the infrastructure.							
	With Mitigation	2	1	4	2	14	Low		Medium
	Nature of impact:	Direct							

Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the decomissioning of the substation	Without Mitigation	1	1	4	3	18	Low	-	Medium
	degree to which impact can be reversed:	High							High
	degree of impact on irreplaceable resources:	Low							High
	Mitigation Measures	• Decomissioning activity should be restricted to the immediate footprint of the infrastructure.							
	With Mitigation	1	1	2	3	12	Low		Medium
Physical disturbance of archaeological sites	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Physical disturbance of palaeontological site	Nature of impact:	Not Applicable							
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	

Visual impact during decommissionig due to dust, vehicles and equipment	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Natural vegetation must be re-established on disturbed areas following decommissioning. The decommissioning footprint must be kept as small as possible. Dust and litter control measures must be included in the EMPr.							
	With Mitigation	2	2	2	3	18	Low	-	
Increased traffic generation around the study area by vehicles associated with decommissioning.	Nature of impact:	Drect							
	Without Mitigation	2	1	2	3	15	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.							
	With Mitigation	2	1	2	2	10	Low	-	
Acoustic impact on residential receptors	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Planning construction activities in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance.							
	With Mitigation	2	2	4	3	24	Low	-	
Gain of short term	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	+	Medium
	degree to which impact can be reversed:	N/A							

employment	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly for semi- and unskilled opportunities.							
	With Mitigation	2	1	6	4	36	Medium	+	
Nuisance from noise, dust and traffic disturbances	Nature of impact:	Direct							
	Without Mitigation	2	1	4	4	28	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by relevant specialists and included in the EMPr							
	With Mitigation	2	1	4	3	21	Low	-	
Increased risk to neighbouring land users	Nature of impact:	Indirect							
	Without Mitigation	2	1	6	3	27	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Development of a code of conduct for decommissioning phase workers, to be signed by the contractor. Contractor to be held liable for compensating farmers for any loses and/or damage that can be linked to							
	With Mitigation	2	1	4	3	21	Low		
Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
	Nature of impact:	Direct							
	Without Mitigation	3	5	2	5	50	Medium	-	Medium

Loss of employment and local economic development opportunities	degree to which impact can be reversed:	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	3	2	2	5	35	Medium	-	
Maintenance of existing landscape and sense of place	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	-	Medium
	degree to which	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	2	5	2	5	45	Medium	-	

BioTherm Energy - Esizayo Powerline

Impacts Identified in the BAR

Significance Rating Table

Construction Phase

Alternative 4- Substation 2, Route Option 2

Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Disturbance to underlying geology for the construction of the powerline	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
Disturbance to underlying geology for the construction of the Substation	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Due to the low impact significance, mitigation measures are not considered to be necessary.							
	With Mitigation	1	1	0	1	2	Low	-	
	Nature of impact:	Dircet							
	Without Mitigation	2	2	4	5	40	Medium	-	Medium

Reduction in land availaibility for grazing animals due to theland being occupied by the transmission and substation infrastructure	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum.							
	With Mitigation	1	2	2	4	20	Low	-	Medium
Increased potential for soil erosion due to vegetation clearance, soil disturbance and a high traffic movement onsite.	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Areas of construction should be (where practical) limited to the extent of the project footprint, and activities outside should be kept to a minimum. Traffic of construction vehicles should be kept to a minimum to reduce soil							
	With Mitigation	1	2	2	2	10	Low	-	Medium
Potential spillage of hazardous substances such as oils, fuel, grease from construction vehicles, and sewage from on-site sanitation systems	Nature of impact:	Direct							
	Without Mitigation	2	2	2	2	12	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	The proper handling and storage of hazardous materials, the use of hardstanding in storage areas of hazardous substances and where spillages are possible. The use of bunding around storage of hazardous materials and proper							
	With Mitigation	1	2	0	1	3	Low	-	Medium
Alterations of flow regimes of watercourses, in close	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium
	degree to which impact can be reversed:	High							

proximity to the site, or that is proposed to be traversed.	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Construction of the powerlines should occur during the dry season and the site rehabilitated before major rainfall events occur. Powerlines must only cross perpendicular to a watercourse and the chosen alignment must							
	With Mitigation	2	2	2	3	18	Low	-	Medium
Temporary degradation of wetland/riparian habitat due to the proposedproposed positioning of the powerlines and pylons	Nature of impact:	Direct							
	Without Mitigation	2	2	8	5	60	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	A more in-depth and thorough freshwater functional assessment should be conducted should BioTherm be recognised as a Preferred Bidder. The detailed freshwater habitat assessment must provide recommendations in							
	With Mitigation	1	2	4	3	21	Low	-	Medium
Potential contamination of groundwater through	Nature of impact:	Direct							
	Without Mitigation	2	1	6	3	27	Low	-	
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• All equipment that has the potential to spill or leak must have a drip tray underneath at all times. • Cement must be mixed on an impermeable surface and not on the bare ground.							
	With Mitigation	1	1	2	2	8	Low	-	
	Nature of impact:	Direct							
	Without Mitigation	2	2	8	4	48	Medium	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							

Impacts on vegetation and protected plant species	Mitigation Measures	• Preconstruction walk-though of the approved development footprint to ensure that sensitive habitats and species are be avoided where possible. • Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible. • Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. • All roads built for construction should have water diversion and erosion control structures present, especially in steep areas. • Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. • Demarcate all areas to be cleared with construction tape or similar material. However caution should be exercised to avoid using material that might entangle fauna.							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Impacts on Fauna due to constructtion activities	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low		Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the construction site. • No fires should be allowed within the site as there is a risk of runaway veld fires. • No fuelwood collection should be allowed on-site. • No dogs or cats should be allowed on site apart from that of the landowners. • If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • No unauthorized persons should be allowed onto the site and site access should be strictly controlled and vehicles which need to roam around the site should be accompanied by the ECO or security personnel.							
	With Mitigation	1	2	2	3	15	Low	-	Medium
	Nature of impact:	Direct							

Increased Soil Erosion risk during construction	Without Mitigation	2	2	8	4	48	Medium	-	Medium
	degree to which impact can be reversed:	Moderate							
	degree of impact on irreplaceable resources:	Moderate							
	Mitigation Measures	• Runoff management and erosion control should be integrated into the project design. • Roads should have runoff control and water management infrastructure present to limit erosion and damage to vegetation. • Disturbance near to drainage lines should be avoided and sensitive drainage areas near to the construction activities should demarcated as no-go areas. • Regular monitoring for erosion problems along the access roads and other cleared areas. • Erosion problems should be rectified on a regular basis. • Sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other waste heaps present during the wet season. • A low cover of vegetation should be left wherever possible within the construction footprint to bind the soil, prevent erosion and promote post-disturbance recovery of an indigenous ground cover.							
	With Mitigation	2	2	2	3	18	Low	-	Medium
Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	2	1	8	4	44	Medium	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	2	1	4	2	14	Low	-	Medium
	Nature of impact:	Direct							

Displacement of Red Data avifauna due to habitat destruction and disturbance associated with the construction of the substation	Without Mitigation	1	1	4	3	18	Low	-	Medium
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. • Measures to control noise and dust should be applied according to current best practice in the industry. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. • The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.							
	With Mitigation	1	1	2	3	12	Low	-	Medium
Physical disturbance of archaeological sites during the construction of the powerlines	Nature of impact:	Direct							
	Without Mitigation	4	5	4	2	26	Low	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	• A 20m buffer must be placed around the colonel ruins idenitified at Substation 1 and must be declared a “No-Go” area;							
	With Mitigation	4	5	4	1	13	Low	-	Medium
Physical disturbance of archaeological sites during the construction of Substation 1	Nature of impact:	Direct							
	Without Mitigation	4	5	4	2	26	Low	-	Medium
	degree to which impact can be reversed:	Low							

	degree of impact on irreplaceable resources:	High							
	Mitigation Measures	• A 20m buffer must be placed around the colonel ruins idenitified at Substation 1 and must be declared a "No-Go" area;							
	With Mitigation	4	5	4	1	13	Low	-	Medium
Vandalism of Heritage items	Nature of impact:	Indirect							
	Without Mitigation	4	5	6	3	45	Medium	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• The rock art site next to the R354 must be protected from vandalism, either by a temporary fence during construction, or else by supervision of construction staff. Alternatively, use the other line options.							
	With Mitigation	4	5	6	1	15	Low	-	Medium
Physical disturbance of palaeontological sites	Nature of impact:	Direct							
	Without Mitigation	1	5	2	2	16	Low	-	Medium
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	• Monitoring of all surface clearances and substantial excavations (>1m deep) by the ECO for fossil material (e.g. bones, teeth, fossil wood) on an on-going basis during the construction phase.							
	With Mitigation	1	5	2	1	8	Low	-	Medium
	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium- High

Visual impact during construction due to dust, vehicles and equipment	degree to which impact can be reversed:	High- The visual impact can be completely reversed if vehicles, equipment, rubble and any other construction materials are removed after construction.							
	degree of impact on irreplaceable resources:	Low- Dust and equipment are not likely to impact on any irreplaceable visual resources.							
	Mitigation Measures	• The handling and transportation of materials which may generate dust must be avoided during high wind conditions.							
	With Mitigation	2	2	4	3	24	Low	-	Medium- High
Visual impact during construction due to vegetation clearing	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	Medium- High
	degree to which impact can be reversed:	High- The visual impact can becompletely reversed, if vegetation is rehabilitated.							
	degree of impact on irreplaceable resources:	Low- From a visual perspective can be re-established.							
	Mitigation Measures	• The construction footprint must be kept as small as possibke, to avoid unneccessary disruption to the existing vegetation.							
	With Mitigation	2	2	4	3	24	Low	-	Medium- High
Increased traffic generation around the study area by construction vehicles-	Nature of impact:	Direct							
	Without Mitigation	2	1	2	3	15	Low	-	
	degree to which impact can be reversed:	Low							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	• The posted speed limit on the R354 in the vacinity of the proposed development is currently 120km/h. it is suggested that the speed limit should be reduced in advance of the intersection with the access road.							
	With Mitigation	2	1	2	2	10	Low	-	
Acoustic impact on residential receptors	Nature of impact:	Direct							
	Without Mitigation	2	2	4	4	32	Medium	-	High
	degree to which impact can be reversed:	High							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	• Planning construction activities in consultation with local communities so that activities witj the greatest potential to generate noise are planned during periods of the day that will result in the least disturbance.							
	With Mitigation	2	2	4	3	24	Low	-	High

Increase in employment opportunities	Nature of impact:	Direct							
	Without Mitigation	3	2	4	3	27	Low	+	Medium
	degree to which impact can be reversed:	None							
	degree of impact on irreplaceable	None							
	Mitigation Measures	Appointment of local contractors; Employment of local labour as far as possible, particularly semi-skilled and unskilled opportunities;							
	With Mitigation	3	2	4	4	36	Medium	+	Medium
Disruption through influx of job seeks	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control influx of job seekers and associated local impacts							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	Manage employment expectations as far as possible, prioritise local employment, engage with local municipality in respect of accommodation of labour / staff brought into the area by contractors/developer							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Increase in communicable diseases and reduced public health	Nature of impact:	Indirect							
	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	Medium - difficult to manage or control communicable disease which could permanently impact local populations							
	degree of impact on irreplaceable	High							
	Mitigation Measures	Development of a labour force Health and Safety Plan, HIV/AIDS awareness, prevention and testing campaign							
	With Mitigation	2	2	6	2	20	Low	-	Medium
Nuisance from noise, dust and traffic disturbances	Nature of impact:	Direct							
	Without Mitigation	2	2	4	3	24	Low	-	Medium
	degree to which impact can be reversed:	Medium - implementation of EMPr measures to reduce noise, dust and traffic related impacts, but unlikely to negate completely							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	Air quality, noise and traffic related mitigation measures recommended by the relevant specialists and included in the EMPr							
	With Mitigation	2	2	2	2	12	Low	-	Medium
	Nature of impact:	Indirect							

Increased risk to neighbouring land users	Without Mitigation	2	2	6	3	30	Low	-	Medium
	degree to which impact can be reversed:	High - provision of compensation to farmers for damage to infrastructure, stock theft, etc.							
	degree of impact on irreplaceable	Low							
	Mitigation Measures	Development of a code of conduct for construction workers, to be signed by the contractor; Contractor to be held liable for compensating farmers for any losses and/or damage that can be linked to construction workers							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Increased risk of veld fires	Nature of impact:	Direct							
	Without Mitigation	2	2	6	4	40	Medium	-	Medium
	degree to which impact can be reversed:	High - provision of compensation to farmers for losses resulting from veld fires							
	degree of impact on irreplaceable resources:	Low							
	Mitigation Measures	Implementation of EMPr i.e. mitigation in respect of construction phase activities that may pose a fire risk (i.e. no open fires allows on site for cooking/heating; activities that pose a fire risk to be property managed and confined to							
	With Mitigation	2	2	4	3	24	Low	-	Medium
Powerline - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
Impacts on vegetation and protected plant species	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Faunal impacts due to	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be	N/A							

Faunal impacts due to construction activities	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Increased Soil Erosion risk during construction	Nature of impact:	Direct							
	Without Mitigation	1	1	0	1	2	Low	+	Medium
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
The no-go option will result in no additional impacts on avifauna and will maintain the current ecological integrity	Nature of impact:	Direct							
	Without Mitigation								
	degree to which impact can be	N/A							
	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	N/A							
	With Mitigation								
Loss of employment and local economic development	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	-	Medium
	degree to which impact can be	N/A							
	degree of impact on irreplaceable	N/A							
	Mitigation Measures	None							
	With Mitigation	3	5	2	5	50	Medium	-	Medium
Maintenance of the existing	Nature of impact:	Direct							
	Without Mitigation	2	5	2	5	45	Medium	+	
	degree to which impact can be reversed:	Direct							

landscape and sense of place	degree of impact on irreplaceable resources:	N/A							
	Mitigation Measures	None							
	With Mitigation	2	5	2	5	45	Medium	+	Medium
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								

	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Substation Alternative 1									
Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								

	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								

	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Substation Alternative 2									
Potential Impact		Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
	Nature of impact:								
	Without Mitigation								

	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								

	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
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	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
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	Nature of impact:								
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	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								

	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
Substation - No-Go									
Potential Impact	Mitigation	Extent (E)	Duration (D)	Magnitude (M)	Probability (P)	Significance (S=(E+D+M)*P)		Status (+ve or -ve)	Confidence
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								

	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
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	With Mitigation								
	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
	With Mitigation								
	Nature of impact:								

	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
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	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
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	Nature of impact:								
	Without Mitigation								
	degree to which impact can be reversed:								
	degree of impact on irreplaceable resources:								
	Mitigation Measures								
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