

APPENDIX F: ENVIRONMENTAL IMPACT ASSESSMENT TABLES

ACTIVITY(S)	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION											RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION											Confidence	Irreplaceable loss of resources	Degree of reversibility		
		Severity	Spatial Scale	Duration	CONSEQUENCE	Freq of Activity	Freq of Impact	Legal Issues	Detection	LIKELIHOOD	Significance	+/-		RISK RATING	Severity	Spatial Scale	Duration	CONSEQUENCE	Freq of Activity	Freq of Impact	Legal Issues	Detection	LIKELIHOOD	Significance				+/-	RISK RATING
CONSTRUCTION PHASE																													
Air Quality & Climate																													
<ul style="list-style-type: none"> Construction of the solar plant and associated structures and the movement of heavy construction vehicles, equipment and personnel along gravel roads/ tracks and subsequent compaction and erosion of soil; Excavation using heavy machinery/ vehicles; and Transportation of construction materials. 	Generation of inhalable PM2.5, PM10 and TSP and impacts on health	2	2	2	6	1	2	1	2	6	36	-	L	<ul style="list-style-type: none"> Use of water sprays during heavy construction activities, thereby limiting the dispersion of particulate emissions; Continuous wetting of the access road during vehicle transport; Wetting of exposed stockpiles to limit the dispersion of wind-blown dust and particulate emissions; Removal of vegetation must be avoided until soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible; Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; All incoming and outgoing truck loads must be covered; Avoid dust-generating works during extremely windy conditions; Apply an appropriate dust suppression protocol to limit the generation of dust through construction activities and traffic on unsealed roads - there may be the need for frequent wetting of the Solar PV access road; The use of chemical stabilisation on access road must be considered as its usually cost-effective for relatively long term or semi-permanent unpaved roads; When working near (within 100 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; and Ensure that all construction vehicles are maintained to the manufacturer's specifications. 	1	2	2	5	1	2	1	2	6	30	-	L	100%	Low	High
<ul style="list-style-type: none"> Construction of the solar plant and associated structures and the movement of heavy construction vehicles, equipment and personnel along gravel roads/ tracks and subsequent compaction and erosion of soil; Excavation using heavy machinery/ vehicles; and Transportation of construction materials. 	GHG emissions during the construction activities	6	2	3	11	3	5	1	3	12	132	-	M	<ul style="list-style-type: none"> Fuel saving through optimal vehicle and equipment use scheduling; Servicing and maintenance of vehicles, plant and machinery; Use of fuel saving technology and high efficiency generators; and Use of low carbon and sulphur fuels. (Waste management through reuse and recycling will reduce the overall carbon footprint)	2	2	3	7	3	5	1	3	12	84	-	L	100%	Low	Medium
Vegetation																													
<ul style="list-style-type: none"> Site clearing and the removal of vegetation Damage to vegetation Construction and Edge Construction Activities Movement of construction vehicles, machinery and personnel 	Potential loss of indigenous vegetation units	6	2	4	12	5	5	5	1	16	192	-	M	<ul style="list-style-type: none"> Demarcate construction footprint area clearly Minimise site clearance to the footprint area only Edge effects of construction activities need to be actively managed Indigenous vegetation outside of the designated Works area must be left undisturbed Restrict the movement of personnel and construction vehicles to where they are needed Remove vegetation in a 'natural manner' when possible, avoiding any harsh lines If the project schedule can accommodate the systematic clearance of the indigenous vegetation from the site, this should be included in the construction plan. This will make provision for current work areas to be cleared of indigenous vegetation which will limit the disturbances which will allow the settlement of the alien invasive species Consult a Botanist/Landscape Architect/Environmentalist to assist with proper vegetation removal procedures Upon completion of construction activities, it must be ensured that no bare areas remain and that indigenous grassland species are reintroduced Strict adherence to the Construction EMP Constant monitoring through the appointment of an ECO 	2	1	4	7	5	5	5	1	16	112	-	L	75%	Medium	Medium
<ul style="list-style-type: none"> Site clearing and the removal of vegetation Disturbance of vegetation Construction and Edge Construction Activities Movement of construction vehicles, machinery and personnel Dumping of material outside of designated areas 	Potential increase in alien vegetation	6	2	4	12	5	5	5	2	17	204	-	M	<ul style="list-style-type: none"> Edge effects of construction activities need to be actively managed Restrict the movement of personnel and construction vehicles to where they are needed If the project schedule can accommodate the systematic clearance of the indigenous vegetation from the site, this should be included in the construction plan. This will make provision for current work areas to be cleared of indigenous vegetation which will limit the disturbances which will allow the settlement of the alien invasive species An Alien Invasive Species Management Plan must be put in place for the duration of the construction phase of the project which must make provision for the following: 	2	1	4	7	5	5	5	1	16	112	-	L	75%	Low	High
<ul style="list-style-type: none"> Site clearing and the removal of vegetation Damage to vegetation Construction and Edge Construction Activities Movement of construction vehicles, machinery and personnel 	Potential loss of floral species of conservation importance	6	2	5	13	5	5	5	3	18	234	-	M	<ul style="list-style-type: none"> Demarcate construction footprint area clearly Minimise site clearance to the footprint area only Edge effects of construction activities need to be actively managed Indigenous vegetation outside of the designated Works area must be left undisturbed Restrict the movement of personnel and construction vehicles to where they are needed Remove vegetation in a 'natural manner' when possible, avoiding any harsh lines If the project schedule can accommodate the systematic clearance of the indigenous vegetation from the site, this should be included in the construction plan. This will make provision for current work areas to be cleared of indigenous vegetation which will limit the disturbances which will allow the settlement of the alien invasive species Consult a Botanist/Landscape Architect/Environmentalist to assist with proper vegetation removal procedures Permits for the damage or removal of protected plant species must be obtained from the relevant CA prior to the cutting or clearing Implementation of a SWMP which allows for the attenuation and percolation of rainwater into the soil substrate of the site 	2	1	4	7	5	5	5	1	16	112	-	L	75%	Medium	Medium
<ul style="list-style-type: none"> Movement of construction vehicles, machinery and personnel resulting in the compaction of the soil substrate Establishment of construction camp & surface infrastructure resulting in more impermeable surfaces 	Loss of catchment area and decreased water inputs	6	3	5	14	5	5	1	4	15	210	-	M	<ul style="list-style-type: none"> Implementation of a SWMP which allows for the attenuation and percolation of rainwater into the soil substrate of the site 	2	1	5	8	5	5	1	3	14	112	-	L	75%	Medium	Medium

• Operation and maintenance of vehicles and machinery resulting in spills or leaks	Contamination of the area by petrochemical spillages	4	2	2	8	5	4	5	2	16	128	-	M	<ul style="list-style-type: none"> All plant and equipment that make use of petrochemical substances must be checked leakages on a daily basis before operations commence. All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. 	2	2	2	6	5	3	5	2	15	90	-	L	75%	Medium	Medium
• Generation of waste and refuse during the execution of construction activities on the site	Contamination of the area by construction and domestic waste	6	2	2	10	5	5	5	2	17	170	-	M	<ul style="list-style-type: none"> If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area. Skips must be made available on-site into which all construction waste can be discarded. All construction waste must be cleared from the site on a daily basis and placed in these skips. The capacity of these skips must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skips are removed. 	2	1	1	4	5	5	5	2	17	68	-	L	75%	Low	High
• Installation, use and emptying of temporary ablutions (chemical toilets) during construction	Contamination of the area as a result of leaking portable toilet facilities.	6	1	2	9	5	5	5	2	17	153	-	M	<ul style="list-style-type: none"> The disposal of the content of these skips must be done at a municipal landfill site. Only portable chemical toilets with a sealed reservoir will be allowed on site. The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal waste water treatment facility. 	2	1	2	5	5	5	5	1	16	80	-	L	75%	Low	High
Wildlife																													
• Site clearing and the removal of vegetation resulting in habitat loss • Damage to vegetation • Establishment of infrastructure	Potential loss of faunal species of conservation importance	6	3	5	14	5	5	5	2	17	238	-	M	<ul style="list-style-type: none"> Demarcate construction footprint area clearly Minimise site clearance to the footprint area only Edge effects of construction activities need to be actively managed Restrict the movement of personnel and construction vehicles to where they are needed If possible, the construction activities are to commence in the winter months to ensure that the animal species that will actively move from the site is not currently rearing young as the movement with young animals could potentially cause mortality amongst the young animals. 	4	1	3	8	4	4	5	1	14	112	-	L	75%	Medium	Medium
• Site clearing and the removal of trees resulting in habitat loss • Damage to trees	Potential loss of vulture breeding habitat (White-backed Vulture)	6	3	5	14	5	5	5	2	17	238	-	M	<ul style="list-style-type: none"> Demarcate construction footprint area clearly Minimise site clearance to the footprint area only Edge effects of construction activities need to be actively managed 	4	1	3	8	4	4	5	1	14	112	-	L	75%	Medium	Medium
• Site clearing and the removal of vegetation resulting in habitat loss • Damage to vegetation • Establishment of infrastructure	Potential loss of foraging habitat for game species	6	2	4	12	5	5	1	1	12	144	-	M	<ul style="list-style-type: none"> Demarcate construction footprint area clearly Minimise site clearance to the footprint area only Edge effects of construction activities need to be actively managed Restrict the movement of personnel and construction vehicles to where they are needed If possible, the construction activities are to commence in the winter months to ensure that the animal species that will actively move from the site is not currently rearing young as the movement with young animals could potentially cause mortality amongst the young animals. 	4	1	4	9	5	5	1	1	12	108	-	L	75%	Medium	Medium
• Operation and maintenance of vehicles and machinery resulting in spills or leaks	Contamination of the area by petrochemical spillages	4	2	2	8	5	4	5	2	16	128	-	M	<ul style="list-style-type: none"> All plant and equipment that make use of petrochemical substances must be checked leakages on a daily basis before operations commence. All plant and equipment that are found to be leaking must be removed from the property and only returned once the leakages have been addressed. 	2	2	2	6	5	3	5	2	15	90	-	L	75%	Medium	Medium
• Generation of waste and refuse during the execution of construction activities on the site	Contamination of the area by construction and domestic waste	6	2	2	10	5	5	5	2	17	170	-	M	<ul style="list-style-type: none"> If any petrochemical substances are stored on the property, this storage must be done on an impermeable surface in a bunded area. Skips must be made available on-site into which all construction waste can be discarded. All construction waste must be cleared from the site on a daily basis and placed in these skips. The capacity of these skips must be monitored on a daily basis to ensure that a replacement skip can be arranged on the same day as the filled skips are removed. 	2	1	1	4	5	5	5	2	17	68	-	L	75%	Low	High
• Installation, use and emptying of temporary ablutions (chemical toilets) during construction	Contamination of the area as a result of leaking portable toilet facilities.	6	1	2	9	5	5	5	2	17	153	-	M	<ul style="list-style-type: none"> The disposal of the content of these skips must be done at a municipal landfill site. Only portable chemical toilets with a sealed reservoir will be allowed on site. The capacity of the reservoirs in the portable chemical toilets must be monitored on a daily basis to ensure that they can be serviced timeously. All removal of the collected sewage waste from the portable chemical toilets must be conducted by a registered service provider for disposal at a municipal waste water treatment facility. 	2	1	2	5	5	5	5	1	16	80	-	L	75%	Low	High
• Vehicle Movement	Road Mortalities	4	2	2	8	4	4	1	1	10	80	-	L	<ul style="list-style-type: none"> Implement speed control measures (e.g. speed limits, traffic calming measures) 	2	2	2	6	2	2	1	1	6	36	-	L	75%	Low	High
Soils, Land Capability and Land Use																													
• Movement of construction vehicles and machinery • Storage of hazardous waste and substances • Maintenance activities • Installation and emptying of temporary ablutions (chemical toilets) • Generation and storage of general waste • Mixing of soil layers during excavation or stockpiling	Soil Contamination	6	2	2	10	5	4	5	2	16	160	-	M	<ul style="list-style-type: none"> Restrict movement of construction employees outside of construction areas Restrict vehicles to travel only on designated roadways Ensure vehicles are in good condition and not leaking fuel or oil when entering the construction site Regular vehicle and equipment inspections Use of drip trays during refueling and under all heavy vehicles when parked Maintenance to be done in suitably designed areas, preferably off site Suitable spill prevention measures to be in place and spills should be immediately cleaned up on occurrence All hazardous materials should be stored within a bund capable of containing 110% of the stored capacity The capacity of the reservoirs in the portable chemical toilets must be monitored daily to ensure that they can be serviced timeously. Spillage should be prevented when the toilets are cleaned or emptied Cement batching to be undertaken in accordance with appropriate management measures outline in the EMPr 	4	1	2	7	5	2	5	2	14	98	-	L	75%	Medium	Medium
• Site clearing and the removal of vegetation • Inappropriate management of soil stockpiles • Increased stormwater run-off due to increased compacted areas • Increased vehicular movement	Soil loss / Soil erosion	6	1	2	9	5	4	5	1	15	135	-	M	<ul style="list-style-type: none"> Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material to prevent erosion of the material. During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.) Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled 	2	1	2	5	5	3	5	1	14	70	-	L	75%	Medium	Medium
• Site clearing and the removal of vegetation • Establishment of construction camp & surface infrastructure • Soil and topsoil stockpiling • Dumping of material outside of designated areas • Erosion & compaction leading to loss of soil fertility • Increased stormwater runoff & leaching of soil minerals	Loss of agricultural potential	2	2	5	9	5	5	5	1	16	144	-	M	<ul style="list-style-type: none"> Demarcate footprint area clearly & control access Minimise site clearance to the footprint area only Minimise vegetation stripping Separate soil layers during excavation to ensure that soil for topsoil for rehabilitation is preserved Edge effects of construction activities need to be actively managed Should new road development be necessary, roads should be ripped and rehabilitated at the end of construction activities All compacted soils should be ripped and profiled at the end of the construction phase. Implement suitable stormwater management and erosion control measures to minimise erosion Upon completion of construction activities, no bare areas remain and that indigenous grassland species are reintroduced Edge effect control needs to be implemented within construction areas, with specific consideration to compaction and erosion control 	0	1	5	6	5	5	5	1	16	96	-	L	75%	Low	High
• Construction activities • Blasting, drilling & heavy earth moving • General vehicular movement • Movement of construction vehicles and machinery • Activities resulting in an increase in noise pollution • Increased human activity • Site clearing • Site camp establishment and equipment storage • Restriction of access, fencing and securing of site	Temporary change in land use from open veld (zoned for mining) to construction	4	2	2	8	5	5	5	1	16	128	-	M	<ul style="list-style-type: none"> Demarcate footprint area clearly Restrict movement of construction employees outside of construction areas Limit working hours Edge effects of construction activities need to be actively managed Restrict vehicles to travelling only on designated roadways Ensure all materials and equipment are neatly stored away Ensure open channel of communication with surrounding land owners to address complaints Ensure a complaints register is available on site and that all complaints are addressed. 	2	2	2	6	5	5	5	1	16	96	-	L	75%	Low	High
Water Quality																													

<ul style="list-style-type: none"> Increased runoff volume and velocity due to site clearing and preparation and soil compaction, causing erosion and sedimentation of the downslope aquatic systems Earthworks /channel modifications resulting in erosion and sedimentation Operation and maintenance of vehicles and machinery resulting erosion 	Increase in water turbidity due to sediment inputs and/or erosion	2	2	2	6	5	3	5	2	15	90	-	L	<ul style="list-style-type: none"> Retain as much indigenous vegetation as possible. Compact the site footprint only, minimise working area. Install a temporary cut off trench, protection berms and sediment traps such as silt fences around the construction area to contain poor quality runoff (if observed). Cover soil stockpiles with a temporary liner to prevent contamination (both topsoil and building materials) Construct temporary silt traps at drainage points to allow sediment settlement from runoff. Implement SWMP Install stormwater attenuation structures to slow down the flow as needed After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for 	0	2	2	4	5	2	5	2	14	56	-	L	100%	Medium	Medium
<ul style="list-style-type: none"> Operation and maintenance of vehicles and machinery resulting in spills or leaks 	Physio-chemical water pollution related to potential spillages of cement and fuels	4	2	2	8	5	4	5	2	16	128	-	M	<ul style="list-style-type: none"> Clean up spillages immediately. Keep chemicals and fuel in bunded areas. Keep vehicles and equipment clean by washing them in dedicated bunded wash bay areas, or off site. Vehicles and equipment to be regularly maintained and cleaned in suitably designed areas, preferably off site. Runoff from the cement/concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager. Reuse of this water in the batching plant could be considered 	2	2	2	6	5	3	5	2	15	90	-	L	100%	Medium	Medium
Visual Impacts																													
<ul style="list-style-type: none"> Site clearing Construction camp establishment General construction activities Excavations & stockpiling 	Negative visual impact on aesthetics	6	2	2	10	5	5	1	2	13	130	-	M	<ul style="list-style-type: none"> Limit the construction footprint Remove vegetation in a 'natural manner' when possible, avoiding any harsh lines No vegetation clearing must take place beyond the development footprint The existing vegetation bordering the proposed firebreaks - which will be established on either side of the perimeter fence, should be retained as far as possible Consult a Botanist/Landscape Architect/Environmentalist to assist with proper vegetation removal procedures Strategically plan the location of site camps and laydown areas so that minimal vegetation is cleared All disturbed areas should be rehabilitated after the construction phase 	3	1	2	6	4	3	1	3	11	66	-	L	75%	Low	High
<ul style="list-style-type: none"> Site clearing Construction camp establishment General construction activities Movement of construction vehicles and machinery Increased human activity Increase in vehicular traffic - construction vehicles, staff transport and material delivery Dust generation Material and equipment storage 	Change of visual landscape and character	6	2	2	10	5	5	1	2	13	130	-	M	<ul style="list-style-type: none"> Minimize construction duration Restrict the movement of personnel and construction vehicles to where they are needed Regulate speed at which heavy machinery/vehicles move Dust suppression through increasing the moisture content in the ground Strategically plan the location of site camps and laydown areas so that it is not visible to surrounding areas All disturbed areas should be rehabilitated after the construction phase Ensure that unwanted construction material is stored in the correct manner and out of sight of surrounding receptors Discard all unwanted construction material and waste at a legal waste facility 	2	1	2	5	4	3	1	1	9	45	-	L	75%	Low	High
<ul style="list-style-type: none"> Security and night time lighting 	Visual intrusion due to glare, light trespass and skyglow	4	3	2	9	5	5	1	3	14	126	-	M	<ul style="list-style-type: none"> Choose suitable types of lighting that minimize glare and sky glow Only focus light sources on where it is needed Consult a qualified lighting engineer or lighting specialist No spotlights should be used Mounting light fixtures should be avoided Utilize motion sensor lights at security buildings 	1	2	2	5	4	4	1	2	11	55	-	L	75%	Low	High
Noise Impacts																													
<ul style="list-style-type: none"> Movement of construction vehicles / equipment 	Noise disturbance	6	2	2	10	5	5	5	2	17	170	-	M	<ul style="list-style-type: none"> Demarcate footprint area clearly Restrict movement of employees outside of mining areas Limit working hours Edge effects of construction activities need to be actively managed Restrict vehicles to travelling only on designated roadways Ensure all equipment and vehicles are regularly serviced Ensure a complaints register is available on site and that all noise complaints are addressed Strict adherence to the Construction EMP Constant monitoring and appointment of an ECO• Impelement a noise control plan 	4	2	2	8	5	2	5	2	14	112	-	L	100%	Low	High
<ul style="list-style-type: none"> Operation of machinery 	Noise disturbance	6	1	2	9	5	4	5	2	16	144	-	M	<ul style="list-style-type: none"> Limit working hours Edge effects of construction activities need to be actively managed Regular maintenance of equipment to ensure moving parts do not emit excessive noise and that silencers are in good working order Ensure open channel of communication with surrounding land owners to mitigate all intrusive noise complaints Ensure a complaints register is available on site and that all noise complaints are addressed Strict adherence to the Construction EMP Constant monitoring and appointment of an ECO Implement a noise control plan 	4	1	2	7	5	2	5	2	14	98	-	L	100%	Low	High
Heritage & Paleontological Impacts																													
<ul style="list-style-type: none"> Site clearing Excavations Movement of construction vehicles and machinery Construction and Edge Construction Activities Human disturbance 	<ul style="list-style-type: none"> Loss of cultural heritage resources Loss of paleontological resources 	2	2	2	6	1	1	5	2	9	54	-	L	<ul style="list-style-type: none"> Demarcate footprint area clearly Minimise site clearance to the footprint area only Restrict movement of construction employees outside of construction areas Edge effects of construction activities need to be actively managed Restrict vehicles to travelling only on designated roadways Strict adherence to the Construction EMP Constant monitoring and appointment of an ECO In the event that any sub-surface paleontological or cultural heritage resources or graves are unearthed during construction process all work has to be stopped until the site has been inspected and mitigated by an appropriately qualified practitioner with the necessary archaeological/paleontological background 	2	1	1	4	1	1	5	1	8	32	-	L	100%	Low	High
Social Impacts																													
<ul style="list-style-type: none"> Construction activities 	Increased annoyance, air quality and noise	8	2	1	11	5	5	1	2	13	143	-	M	<ul style="list-style-type: none"> Apply an appropriate dust suppression protocol to limit the generation of dust through construction activities and traffic on unsealed roads. Ensure that all construction vehicles are maintained to manufacturer's specifications. 	8	2	1	11	4	4	1	2	11	121	-	M	75%	Low	High

• Construction activities	Increase in crime	8	3	1	12	4	4	1	2	11	132	-	M	<ul style="list-style-type: none"> • Ensure that construction workers are clearly identifiable. All workers should carry identification cards and wear identifiable clothing; • Fence off the construction site and control access to these sites; • Appoint an independent security company to monitor the site; • Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum; 	8	2	1	11	4	4	1	2	11	121	-	M	75%	Low	High
• Construction activities	Increased risk of HIV infections	8	2	5	15	2	2	1	4	9	135	-	M	<ul style="list-style-type: none"> • Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms; • Expose workers to a health and HIV/AIDS awareness educational programme; • Extend the HIV/AIDS program into the community with a specific focus on schools and youth clubs. 	8	2	5	15	2	2	1	4	9	135	-	M	75%	High	Low
• Construction activities	Influx of construction workers	4	2	2	8	3	4	1	2	10	80	-	L	<ul style="list-style-type: none"> • Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors; • Apply the existing Procurement Policy as drawn up in consultation with community leaders and ward counsellors for the area. 	4	2	2	8	4	3	1	2	10	80	-	L	75%	Low	High
• Construction activities	Hazard exposure	6	2	2	10	5	5	1	2	13	130	-	M	<ul style="list-style-type: none"> • Ensure all construction equipment and vehicles are properly maintained at all times; • Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly; • Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to; 	4	1	1	6	3	3	1	3	10	60	-	L	75%	Low	High
• Construction activities	Disruption of daily living patterns	6	2	2	10	4	4	1	3	12	120	-	M	<ul style="list-style-type: none"> • Ensure that, at all times, people have access to their properties as well as to social facilities. 	2	2	1	5	2	2	1	2	7	35	-	L	75%	Low	High
• Construction activities	Disruptions to social and community infrastructure	8	3	2	13	4	4	1	2	11	143	-	M	<ul style="list-style-type: none"> • Regularly monitor the effect that construction is having on infrastructure and immediately report any damage to infrastructure to the appropriate authority; • Ensure that where communities' access is obstructed that this access is restored to an acceptable state. 	6	3	2	11	4	4	1	2	11	121	-	M	75%	Low	High
• Construction activities	Job creation and skills development	8	2	2	12	4	4	1	1	10	120	+	M	<ul style="list-style-type: none"> • Wherever feasible, local residents should be recruited to fill semi and unskilled jobs; • women should be given equal employment opportunities and encouraged to apply for positions; • A skills transfer plan should be put in place at an early stage and workers should be given the opportunity to develop skills which they can use to secure jobs elsewhere post-construction. 	8	2	2	12	4	4	1	1	10	120	+	M	75%	Medium	Medium
• Construction activities	Positive economic impacts	8	2	3	13	4	4	1	2	11	143	+	M	<ul style="list-style-type: none"> • A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase. 	8	2	3	13	4	4	1	2	11	143	+	M	75%	Medium	Medium
Traffic Impacts																													
Construction related vehicular movement	Increase in traffic	6	3	1	10	2	3	5	2	12	120	-	M	<ul style="list-style-type: none"> • Ensure staff transport is done by bus to reduce impact in the peak period. • Stagger material, component and abnormal load deliveries 	4	3	2	9	2	3	5	2	12	108	-	L	75%	Low	High
Construction related vehicular movement	Increase of incidents with pedestrians and livestock	6	3	1	10	2	3	5	2	12	120	-	M	<ul style="list-style-type: none"> • Reduction in speed of vehicles • Adequate enforcement of the law • Implementation of pedestrian safety initiatives 	2	3	1	6	2	3	5	1	11	66	-	L	75%	Low	High
Construction related vehicular movement	Increase in dust from gravel roads	6	3	1	10	3	2	5	2	12	120	-	M	<ul style="list-style-type: none"> • Reduction in speed of the vehicles • Construction of gravel road in terms of TRH 20 • Implement a road maintenance program under the auspices of the respective transport department. 	4	3	1	8	2	2	5	1	10	80	-	L	75%	Low	High
Construction related vehicular movement	Increase in road maintenance	6	3	2	11	2	3	5	2	12	132	-	M	<ul style="list-style-type: none"> • Implement a road maintenance program under the auspices of the respective transport department. 	4	3	2	9	2	3	5	2	12	108	-	L	75%	Low	High
Abnormal Loads	Additional abnormal loads	2	1	1	4	2	2	5	1	10	40	-	L	<ul style="list-style-type: none"> • Ensure abnormal vehicles travel to and from the proposed development travel in the 'off peak' periods or stagger delivery. • Adequate enforcement of the law 	2	1	1	4	2	2	5	1	10	40	-	L	75%	Low	High
Internal access roads	Increase in dust from gravel roads	4	2	1	7	2	2	5	2	11	77	-	L	<ul style="list-style-type: none"> • Enforce a maximum speed limit on the development • Appropriate, timely and high quality maintenance required in terms of TRH20 • Possible use of an approved dust suppressant techniques 	4	2	1	7	2	2	5	2	11	77	-	L	75%	Low	High
Internal access roads	New / larger access points	2	2	1	5	2	2	5	1	10	50	-	L	<ul style="list-style-type: none"> • Adequate road signage according to the SARTSM • Approval from the respective roads department 	2	2	1	5	2	2	5	1	10	50	-	L	75%	Low	High

ACTIVITY(S)	POTENTIAL ENVIRONMENTAL IMPACT	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION												RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION												Confidence	Irreplaceable loss of resources	Degree of reversibility
		Severity	Spatial Scale	Duration	CONSEQUENCE	Freq of Activity	Freq of Impact	Legal Issues	Detection	LIKELIHOOD	Significance	+/-	RISK RATING		Severity	Spatial Scale	Duration	CONSEQUENCE	Freq of Activity	Freq of Impact	Legal Issues	Detection	LIKELIHOOD	Significance	+/-	RISK RATING			
OPERATIONAL PHASE																													
Renewable Energy Goals and Green House Gas Reduction																													
• Operation of the solar plant	Contribution to Renewable Energy Goals and Green House Gas	4	2	5	11	4	4	5	3	16	176	+	M	None	4	2	5	11	4	4	5	3	16	176	+	M	100%	Low	High
Vegetation																													
• Disturbance of vegetation	Spreading of alien invasive vegetation	6	2	4	12	5	5	5	2	17	204	-	M	<ul style="list-style-type: none"> An Alien Invasive Management Plan must be established and implemented for the operational phase of the development. This plant must be in place when the development goes operational. The Alien Invasive Management Plan must make provision for the identification of all the alien invasive plant species on the property as well as the management and control measures to be implemented. In addition, the Alien Invasive Management Plan must make provision for the monitoring of all management and control interventions to gauge the success of these activities. 	2	1	4	7	5	5	5	1	16	112	-	L	75%	Low	High
• Movement of vehicles, machinery and personnel resulting in the compaction of the soil substrate • Impermeable surfaces of the solar plant	Loss of catchment area and decreased water inputs	6	3	5	14	5	5	1	4	15	210	-	M	<ul style="list-style-type: none"> A Stormwater Management Plan must be put in place for the construction phase of the development that will allow all the rainwater that fall within the study area to be allowed to percolate into the substrate for continuous supply of the local groundwater. An Alien Invasive Management Plan must be established and implemented for the operational phase of the development. This plant must be in place when the development goes operational. The Alien Invasive Management Plan must make provision for the identification of all the alien invasive plant species on the property. The design of the substation(s) that will be present on the site must make provision for the transformers to be located within banded areas that has a containment capacity of 110% of the total volume of petrochemical fluids as contained within the facility. A specific emergency response plant must be included the Operational Management Plan for the project that specifically details the actions that must be taken when the spill from the substation or transformers occur. 	2	1	5	8	5	5	1	3	14	112	-	L	75%	Medium	Medium
• Substations on site presents a risk of leakages	Contamination of the area by petrochemical spillages	4	2	2	8	5	4	5	2	16	128	-	M	<ul style="list-style-type: none"> A designated eating area must be established within the project site. Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the employees. The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously. The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker. Monitoring of the sewage system for any malfunctions or leaks must be provided for in the Operational Management Plan for the project. Regular servicing and maintenance of the sewage system must be included in the Operational Management Plan for the project. 	2	2	2	6	5	3	5	2	15	90	-	L	75%	Low	High
• Generation of waste during the execution of operational activities on the site	Contamination of the area by domestic waste	6	2	2	10	5	5	5	2	17	170	-	M	<ul style="list-style-type: none"> A designated eating area must be established within the project site. Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the employees. The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously. The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker. Monitoring of the sewage system for any malfunctions or leaks must be provided for in the Operational Management Plan for the project. Regular servicing and maintenance of the sewage system must be included in the Operational Management Plan for the project. 	2	1	1	4	5	5	5	2	17	68	-	L	75%	Low	High
• The presence of a conservancy tank creates a risk of leakages from this tank.	Contamination of the area as a result of leaking ablution facilities.	6	1	2	9	5	5	5	2	17	153	-	M	<ul style="list-style-type: none"> Monitoring of the sewage system for any malfunctions or leaks must be provided for in the Operational Management Plan for the project. Regular servicing and maintenance of the sewage system must be included in the Operational Management Plan for the project. 	2	1	2	5	5	5	5	1	16	80	-	L	75%	Low	High
Wildlife																													
• Powerline infrastructure	Potential increase in the number of bird-strikes along the connection powerline	6	3	5	14	5	5	5	2	17	238	-	M	<ul style="list-style-type: none"> Make provision to have the powerline as low as possible. It is generally accepted that the lower the powerlines are above ground level, a reduction in the risk of bird-strikes will take place; and Provision of line markers along the powerline to make the powerline more visible to birds. 	4	1	3	8	4	4	5	1	14	112	-	L	75%	Medium	Medium
• Solar Plant and associated infrastructure	Potential disruption of open space corridor	6	2	4	12	5	5	1	1	12	144	-	M	<ul style="list-style-type: none"> The land use on the project site as well as the surrounding properties are similar and makes provision for the presence of large areas under indigenous vegetation, which will naturally allow for the movement of species through the area irrespective of the presence of the project. The rehabilitation plan that will accompany the Quantum Cost Calculation for Rehabilitation must make provision for the rehabilitation of the vegetation on the project site to ensure that the vegetation resembles the of the surrounding areas to ensure that This impact will only be mitigated during the rehabilitation phase of the project as discussed above. The rehabilitation will make provision for the re-establishment of the vegetation type (Limpopo Sweet Bushveld) on the project area. Once the vegetation type has been replaced on the project area, the vegetation communities will recover to such an extent that the foraging habitat for game species will return. 	4	1	4	9	5	5	1	1	12	108	-	L	75%	Medium	Medium
• Site clearing and the removal of vegetation resulting in habitat loss	Potential loss of foraging habitat for game species	6	2	4	12	5	5	1	1	12	144	-	M	<ul style="list-style-type: none"> The land use on the project site as well as the surrounding properties are similar and makes provision for the presence of large areas under indigenous vegetation, which will naturally allow for the movement of species through the area irrespective of the presence of the project. The rehabilitation plan that will accompany the Quantum Cost Calculation for Rehabilitation must make provision for the rehabilitation of the vegetation on the project site to ensure that the vegetation resembles the of the surrounding areas to ensure that This impact will only be mitigated during the rehabilitation phase of the project as discussed above. The rehabilitation will make provision for the re-establishment of the vegetation type (Limpopo Sweet Bushveld) on the project area. Once the vegetation type has been replaced on the project area, the vegetation communities will recover to such an extent that the foraging habitat for game species will return. 	4	1	4	9	5	5	1	1	12	108	-	L	75%	Medium	Medium
• Substations on site presents a risk of leakages	Contamination of the area by petrochemical spillages	4	2	2	8	5	4	5	2	16	128	-	M	<ul style="list-style-type: none"> The design of the substation(s) that will be present on the site must make provision for the transformers to be located within banded areas that has a containment capacity of 110% of the total volume of petrochemical fluids as contained within the facility. A specific emergency response plant must be included the Operational Management Plan for the project that specifically details the actions that must be taken when the spill from the substation or transformers occur. 	2	2	2	6	5	3	5	2	15	90	-	L	75%	Low	High
• Generation of waste during the execution of operational activities on the site	Contamination of the area by domestic waste	6	2	2	10	5	5	5	2	17	170	-	M	<ul style="list-style-type: none"> A designated eating area must be established within the project site. Covered domestic waste bins must be present at the eating area to receive all the domestic waste generated by the employees. The capacity of these domestic waste bins must be monitored on a daily basis to ensure that they are emptied timeously. The domestic waste from these waste bins must be removed off site and disposed of at a municipal landfill site on a weekly basis or more regularly if the bins fill up quicker. Monitoring of the sewage system for any malfunctions or leaks must be provided for in the Operational Management Plan for the project. Regular servicing and maintenance of the sewage system must be included in the Operational Management Plan for the project. 	2	1	1	4	5	5	5	2	17	68	-	L	75%	Low	High
• The presence of a conservancy tank creates a risk of leakages from this tank.	Contamination of the area as a result of leaking ablution facilities.	6	1	2	9	5	5	5	2	17	153	-	M	<ul style="list-style-type: none"> Monitoring of the sewage system for any malfunctions or leaks must be provided for in the Operational Management Plan for the project. Regular servicing and maintenance of the sewage system must be included in the Operational Management Plan for the project. 	2	1	2	5	5	5	5	1	16	80	-	L	75%	Low	High
• Vehicle Movement	Road Mortalities	4	2	2	8	4	4	1	1	10	80	-	L	<ul style="list-style-type: none"> Implement speed control measures (e.g. speed limits, traffic calming measures) 	2	2	2	6	2	2	1	1	6	36	-	L	75%	Low	High
Soils, Land Capability and Land Use																													
• Storage of hazardous substances • Presence of transformers on site • Management of the conservancy tank • Generation and storage of general waste	Soil Contamination	6	2	2	10	5	4	5	2	16	160	-	M	<ul style="list-style-type: none"> Restrict vehicles to travel only on designated roadways Ensure vehicles are in good condition and not leaking fuel or oil when entering the site Regular vehicle and equipment inspections Suitable spill prevention measures to be in place and spills should be immediately cleaned up on occurrence All hazardous materials should be stored within a bund capable of containing 110% of the stored capacity The capacity of the conservancy tank must be monitored regularly to ensure that it can be serviced timeously. Spillage should be prevented when the conservancy tank is cleaned or emptied 	4	1	2	7	5	2	5	2	14	98	-	L	75%	Medium	Medium
• Inappropriate management of gravel roads • Increased stormwater run-off due to increased compacted areas	Soil erosion	6	1	2	9	5	4	5	1	15	135	-	M	<ul style="list-style-type: none"> Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled Regular maintenance of internal roads and access road to ensure appropriate erosion protection 	2	1	2	5	5	3	5	1	14	70	-	L	75%	Low	High

Water Quality & Quantity • Increased runoff volume and velocity due to compacted surfaces from the site • Change in topography, land use and vegetation removal • Catchment modification	Increase in water turbidity due to sediment inputs and/or erosion	0	2	5	7	3	3	1	3	10	70	-	L	<ul style="list-style-type: none"> Retain as much indigenous vegetation as possible. Implement SWMP Release structures for stormwater runoff from the site should dissipate energy and disperse flow to ensure minimal impact to the receiving environment. Use natural drainage lines as much as possible 	0	1	5	6	2	2	1	3	8	48	-	L	100%	Low	High
• Increased runoff volume and velocity due to compacted surfaces from the site	Potential sedimentation several months after the site has been constructed.	2	2	5	9	3	3	1	3	10	90	-	L	<ul style="list-style-type: none"> Retain as much indigenous vegetation as possible. Implement SWMP Release structures for stormwater runoff from the site should incorporate silt traps to allow for settlement of sediments. Silt traps to be regularly cleaned. 	0	1	5	6	2	2	1	3	8	48	-	L	100%	Low	High
• Operation and maintenance of vehicles and machinery resulting in spills or leaks • Transformers on site	Physio-chemical water pollution related to potential spillages / leakages of fuels and oils	2	1	2	5	1	1	1	2	5	25	-	L	<ul style="list-style-type: none"> Clean up spillages immediately. Keep chemicals and fuel in bunded areas. Keep vehicles and equipment clean by washing them in dedicated bunded wash bay areas, or off site. Vehicles and equipment to be regularly maintained and cleaned in suitably designed areas, preferably off site. 	0	1	1	2	1	1	1	2	5	10	-	L	100%	Low	High
• Borehole water abstraction	• Lowering of groundwater levels- groundwater abstraction from BH2 • Lowering of regional groundwater levels within the aquifer • Lowering of the water table due to dewatering	8	3	4	15	4	4	5	3	16	240	-	M	<ul style="list-style-type: none"> Adhere to pumping schedule and amendment of schedule by hydrogeologist, if necessary. It is recommended that the pump inlet be installed at 68 mbgl and that the borehole be pumped at a yield of 0.42 L/s (1500 L/hr) for 12 hours and left to recover for at least 12 hours before pumping commences again. Given this pumping schedule the total volume of water that can be abstracted per day is 18 000 L/day (18.0 m3 /day). Monitoring of the groundwater levels and quality of the surrounding monitoring boreholes and the production and reserve boreholes. 	6	3	4	13	4	4	5	2	15	195	-	M	75%	Medium	Medium
Visual Impacts • Presence of the PV Panels • Presence of the transmission line • Presence of the substations	Landscape visual change	6	2	2	10	5	5	1	2	13	130	-	M	<ul style="list-style-type: none"> The existing vegetation bordering the proposed firebreaks adjacent to the perimeter fence should be retained as far as possible If the existing vegetation is not retained, set up visual screens (such as trees, shrubs or hedges) along the perimeter of the study area Consult a Botanist/Landscape Architect/Environmentalist to assist the selection and placement of suitable vegetation for visual screens Ensure that the PV Panels, transmission lines, transmission line corridors and substations are maintained and in a visually acceptable state at all times 	3	1	2	6	4	3	1	3	11	66	-	L	75%	Low	High
• Presence of ancillary infrastructure • Operation of substations and ancillary infrastructure • Heavy machinery and vehicle movement	Change of visual character	6	2	2	10	5	5	1	2	13	130	-	M	<ul style="list-style-type: none"> Set up visual screens (such as trees, shrubs or hedges) along the perimeter of the study area Consult a Botanist/Landscape Architect/Environmentalist to assist with selecting suitable vegetation for visual screens Use suitable building finishes/colours that blend in with the surrounding landscape Minimize the time spent by personnel onsite Strategically plan the location of laydown areas so that it is not visible to surrounding areas Minimize the time spent by personnel in vehicles onsite Regulate speed at which heavy machinery/vehicles move Regulate speed at which heavy machinery/vehicles move 	2	1	2	5	4	3	1	1	9	45	-	L	75%	Low	High
• Security and night time lighting	Visual intrusion due to glare, light trespass and skyglow	4	3	2	9	5	5	1	3	14	126	-	M	<ul style="list-style-type: none"> Choose suitable types of lighting that minimize glare and sky glow Only focus light sources on where it is needed Consult a qualified lighting engineer or lighting specialist No spotlights should be used Mounting light fixtures should be avoided Utilize motion sensor lights at security buildings 	1	2	2	5	4	4	1	2	11	55	-	L	75%	Low	High
Social Impacts • Operational activities	Glare & glint	8	2	1	11	5	5	1	2	13	143	-	M	<ul style="list-style-type: none"> Follow the recommended mitigation measures suggested in the Traffic Impact Assessment. 	8	2	1	11	4	4	1	2	11	121	-	M	75%	Low	High
• Operational activities	Transformation of the sense of place	8	2	1	11	5	5	1	2	13	143	-	M	<ul style="list-style-type: none"> Apply the mitigation measures suggested in the Visual Impact Assessment Report; Communicate the benefits associated with renewable energy to the broader community; Ensure that all affected landowners and tourist associations are regularly consulted; A Grievance Mechanism should be put in place and all grievances should be dealt with transparently; The mitigation measures recommended in the Heritage and Palaeontology Impact Assessment should be followed. 	8	2	1	11	4	4	1	2	11	121	-	M	75%	Low	High
• Operational activities	Positive economic impacts	6	1	3	10	4	4	1	2	11	110	+	L	<ul style="list-style-type: none"> Implement a training and skills development programme for local employees/work seekers; Work closely with the appropriate municipal structures regarding establishing a social responsibility programme. Ensure that the procurement policy supports local enterprises; Establish a social responsibility programme either in line with the REIPPP BID guidelines or equivalent; Work closely with the appropriate municipal structures regarding establishing a social responsibility programme; 	6	1	3	10	4	4	1	2	11	110	+	L	75%	Low	Medium
Traffic Impacts Internal access roads	Increase in dust from gravel roads	4	2	1	7	2	2	5	2	11	77	-	L	<ul style="list-style-type: none"> Enforce a maximum speed limit on the development Appropriate, timely and high quality maintenance required in terms of TRH20 Possible use of an approved dust suppressant 	4	2	1	7	2	2	5	2	11	77	-	L	75%	Low	High
Internal access roads	New / larger access points	2	2	1	5	2	2	5	1	10	50	-	L	<ul style="list-style-type: none"> Adequate road signage according to the SARTSM Approval from the respective roads department 	2	2	1	5	2	2	5	1	10	50	-	L	75%	Low	High

APPENDIX G: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT



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Draft Environmental Management Programme Report (EMPr) for the Lephalale Solar Plant

Remaining Extent of Farm Appelvlakte No. 448, Lephalale
Local Municipality, Waterberg District, Limpopo Province

Draft for Public Participation

April 2022

K2021699383 (South Africa) Proprietary Limited

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ACRONYMS AND ABBREVIATIONS

AC	alternating current
AIDS	acquired immunodeficiency syndrome
AQIA	Air Quality Impact Assessment
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
CCTV	closed-circuit television
cEO	contractor's Environmental Officer
CLO	Community Liaison Officer
DAFF	Department of Agriculture, Forestry and Fisheries
DC	direct current
DEFF	Department of Environment, Forestry and Fisheries
dEO	developer Environmental Officer
DEMFWDD	Draft Environmental Management Framework for the Waterberg District, 2010
DOT	Department of Transport
DPM	Developer's Project Manager
DSS	Developer Site Supervisor
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners of South Africa
EAR	Environmental Audit Report
ECA	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EPC	Engineering, Procurement and Construction
ERAP	Emergency Response Action Plan
ESA	Ecological Support Area
FPA	Fire Protection Agency
FPO	Fire Protection Officer
FSR	Final Scoping Report
GCS	GCS Water and Environmental Consultants (Pty) Ltd
GIS	Geographic Information System

GN	Government Notice
GNR	Government Notice Regulation
GPS	Global Positioning System
h	hours
ha	hectare
HCS	Hazardous Chemical Substance
HIA	Heritage Impact Assessment
HIV	human immunodeficiency virus
I&AP	Interested and Affected Party
IAP	Invasive Alien Plants
IPP	Independent Power Producer
km	kilometre
kv	kilovolt
L	litres
LDEDET	Limpopo Department of Economic Development, Environment and Tourism
LEO	Limpopo Environmental Outlook Report, 2016
LGEP	Limpopo Green Economy Plan (LEDET, 2013)
m	metres
m ²	square metres
m ³	cubic metres
mamsl	metres above mean sea level
mm	millimetres
ML	megalitres
MSDS	Material Safety Data Sheets
MW	megawatts
NCR	Noise Control Regulations
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM: BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NFA	National Forestry Act, 1998 (Act No. 4 of 1998)
NHRA	National Heritage Resources Agency
NFEPA	National Freshwater Ecosystems Priority Area
NPAES	National Protected Areas Expansion Strategy
NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)

NWA	National Water Act, 1998 (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
O&M	Operational and Management
PPE	Personal Protective Equipment
PPP	Public Participation Process
PV	Photovoltaic
REIPP	Renewable Independent Power Producer Programme
SABS	South African Bureau of Standards
SACNASP	South African Council for Natural Scientific Professionals
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SALA	Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970)
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAPS	South African Police Services
SARTSM	South African Road Traffic Signs Manual
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
S&EIA	Scoping and Environmental Impact Assessment
SPLUMA	Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013)
SWMP	stormwater management plan
TIA	Traffic Impact Assessment
TOPS	Threatened or Protected Species
VIA	Visual Impact Assessment
WEMP	Waterberg Environmental Management Plan, 2006
WMA	Water Management Area
WTW	Water Treatment Works
WWTW	Wastewater Treatment Works
WUL	Water Use License
WULA	Water Use License Application

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS	III
TABLE OF CONTENTS	VI
LIST OF FIGURES	VI
LIST OF TABLES	VII
LIST OF APPENDICES	VII
1 INTRODUCTION	1
1.1 PURPOSE OF THE EMPR.....	4
1.2 CONTENT OF THE EMPR	5
1.3 DETAILS OF THE EAP	8
1.4 DETAILS OF THE APPLICANT	8
1.5 ASSUMPTIONS AND LIMITATIONS.....	9
1.6 APPLICABLE LEGISLATION, POLICY AND BEST PRACTICE GUIDELINES.....	9
1.7 ASPECTS OF THE ACTIVITY THAT ARE COVERED BY THE EMPR.....	18
1.7.1 <i>Solar PV Field</i>	19
1.7.2 <i>Associated infrastructure</i>	20
1.7.3 <i>Temporary Infrastructure - combined maximum size of 10 hectares</i>	22
1.8 PROJECT PHASES AND ACTIVITIES.....	22
1.9 COMPOSITE ENVIRONMENTAL SENSITIVITY MAP.....	23
2 ENVIRONMENTAL IMPACT STATEMENT	26
3 ROLES AND RESPONSIBILITIES	28
4 ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE	33
4.1 DOCUMENT CONTROL/FILING SYSTEM	33
4.2 DOCUMENTATION TO BE AVAILABLE	33
4.3 WEEKLY ENVIRONMENTAL CHECKLIST.....	33
4.4 ENVIRONMENTAL SITE MEETINGS.....	34
4.5 REQUIRED METHOD STATEMENTS.....	34
4.6 ENVIRONMENTAL INCIDENT LOG (DIARY)	35
4.7 NON-COMPLIANCE.....	36
4.8 CORRECTIVE ACTION RECORDS.....	36
4.9 PHOTOGRAPHIC RECORD	36
4.10 COMPLAINTS REGISTER	37
4.11 CLAIMS FOR DAMAGES.....	37
4.12 INTERACTIONS WITH I & APS	38
4.13 ENVIRONMENTAL AUDITS	38
4.14 FINAL ENVIRONMENTAL AUDITS	39
4.15 ENVIRONMENTAL TRAINING AND AWARENESS-RAISING	39
5 PROPOSED IMPACT MANAGEMENT ACTIONS	39
6 DECLARATION	101

LIST OF FIGURES

Figure 1: Regional Locality Map	2
Figure 2: Site layout and affected properties.....	3
Figure 3: Composite Environmental Sensitivity Map	25

LIST OF TABLES

Table 1: Contents of this Environmental Management Programme (EMPr)	6
Table 2: Details of the EAP	8
Table 3: Details of the Applicant	8
Table 4: Applicable legislation, policy and best practice guidelines	10
Table 5: GPS coordinates	19
Table 6: Key impacts during the construction phase	26
Table 7: Key impacts during the operational phase	27
Table 8: Roles and Responsibilities for Implementation of the EMPr	29

LIST OF APPENDICES

APPENDIX A

APPENDIX B

1 INTRODUCTION

GCS Water and Environmental Consultants (Pty) Ltd (GCS) has been appointed by K2021699383 (South Africa) (Pty) Ltd (the applicant) as the Environmental Assessment Practitioner (EAP) to undertake the Application for Environmental Authorisation (EA) for Lephalale Solar Project, Remaining Extent of Farm Appelvlakte No. 448, Lephalale Local Municipality, Waterberg District, Limpopo Province, in terms of the 2014 Environmental Impact Assessment (EIA) Regulations, as amended. See Figures 1 & 2. This application for EA will be submitted to the Limpopo Department of Economic Development, Environment and Tourism (LDEDET).

The site was selected through a site selection process which is detailed in the Final Scoping Report (FSR). The site is located approximately 15 km northwest of Lephalale, is owned by the Exxaro Grootegeluk Coal Mine, and is currently undeveloped and forms part of the Manketti Private Nature Reserve, which is under the ownership of Exxaro. An overhead powerline runs along the eastern boundary of the site. As such the study area is largely in its natural state with extensive mining activities associated with the Exxaro Grootegeluk Coal Mine located to the west of the site. The Marapong settlement is located approx. 1.5 km south of the site.

The following site-specific characteristics derived from the web-based national screening tool (17/08/2021) (Department of Environment, Forestry and Fisheries, 2021) [Appendix D of the FSR] have informed the applicable listed activities:

- The entire study area is classified as an Ecological Support Area (ESA 1) (LDEDET, 2013); and
- The entire study area falls within a Freshwater Ecosystem Priority Area (FEPA), although there are no natural watercourses or wetlands within 500 m of the study area.

K2021699383 (South Africa) (Pty) Ltd (the Applicant) proposes the development of a solar plant that will generate electricity using photovoltaic (PV) panels to supplement power at the Grootegeluk coal mine. The solar plant and associated infrastructure will be approximately 256 hectares (ha) in extent and will generate approximately 100 megawatts (MW) of power. This opportunity leverages the potential cost savings of such supplementary supply while taking advantage of the reduced carbon footprint of the renewable nature of the technology. The Lephalale Solar facility is being developed with a maximum installed capacity of 100 MWp (DC) which produces 80 MWac (AC) of electricity. The facility will be in operation for at least 20 years. A detailed description of the aspects of the project covered in this Environmental Management Programme Report (EMPr) is provided later in this section. Note that a development envelope is proposed to allow for the micro-siting of the associated infrastructure during the detailed engineering phase of the project (i.e., post-EA).

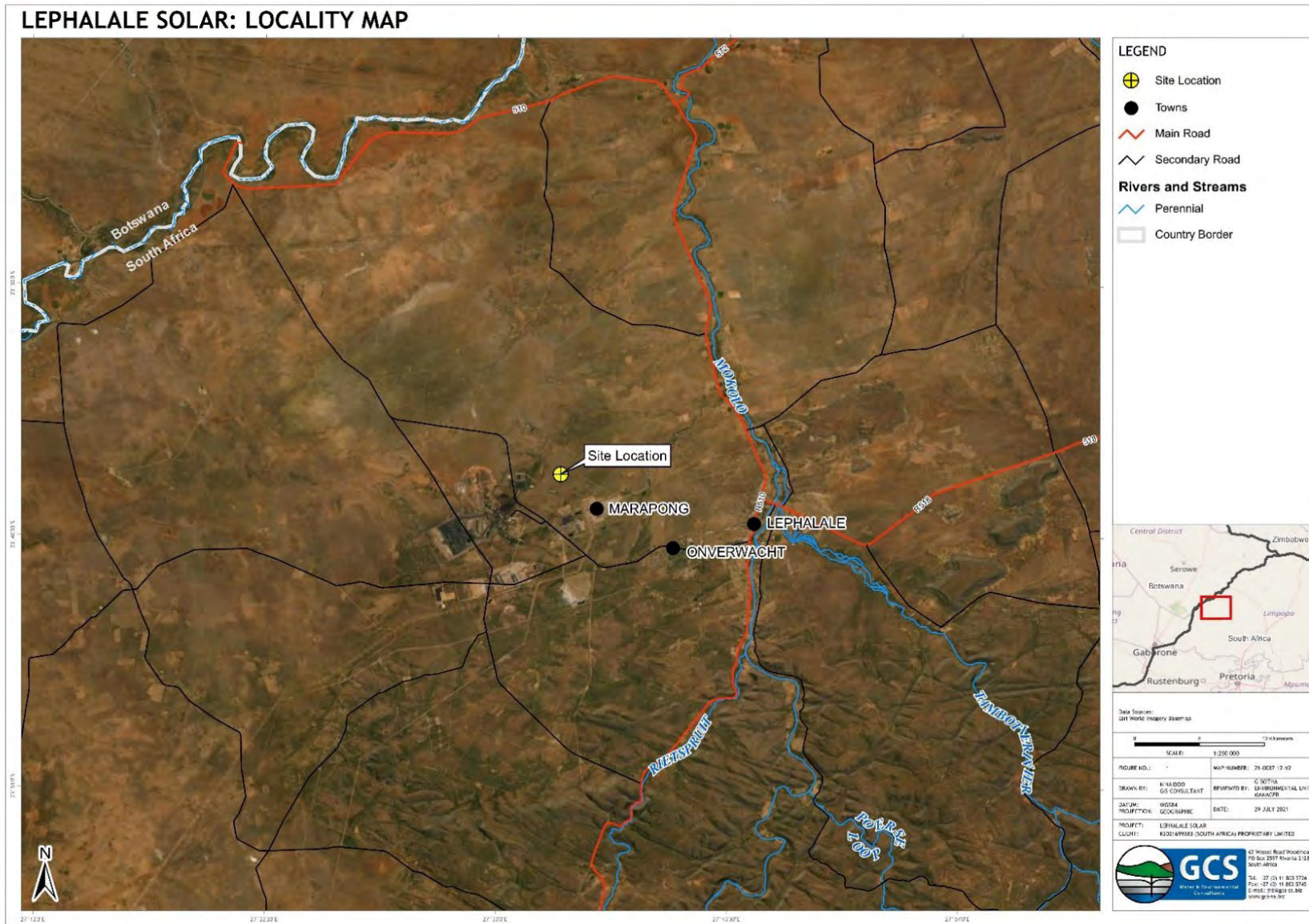


Figure 1: Regional Locality Map

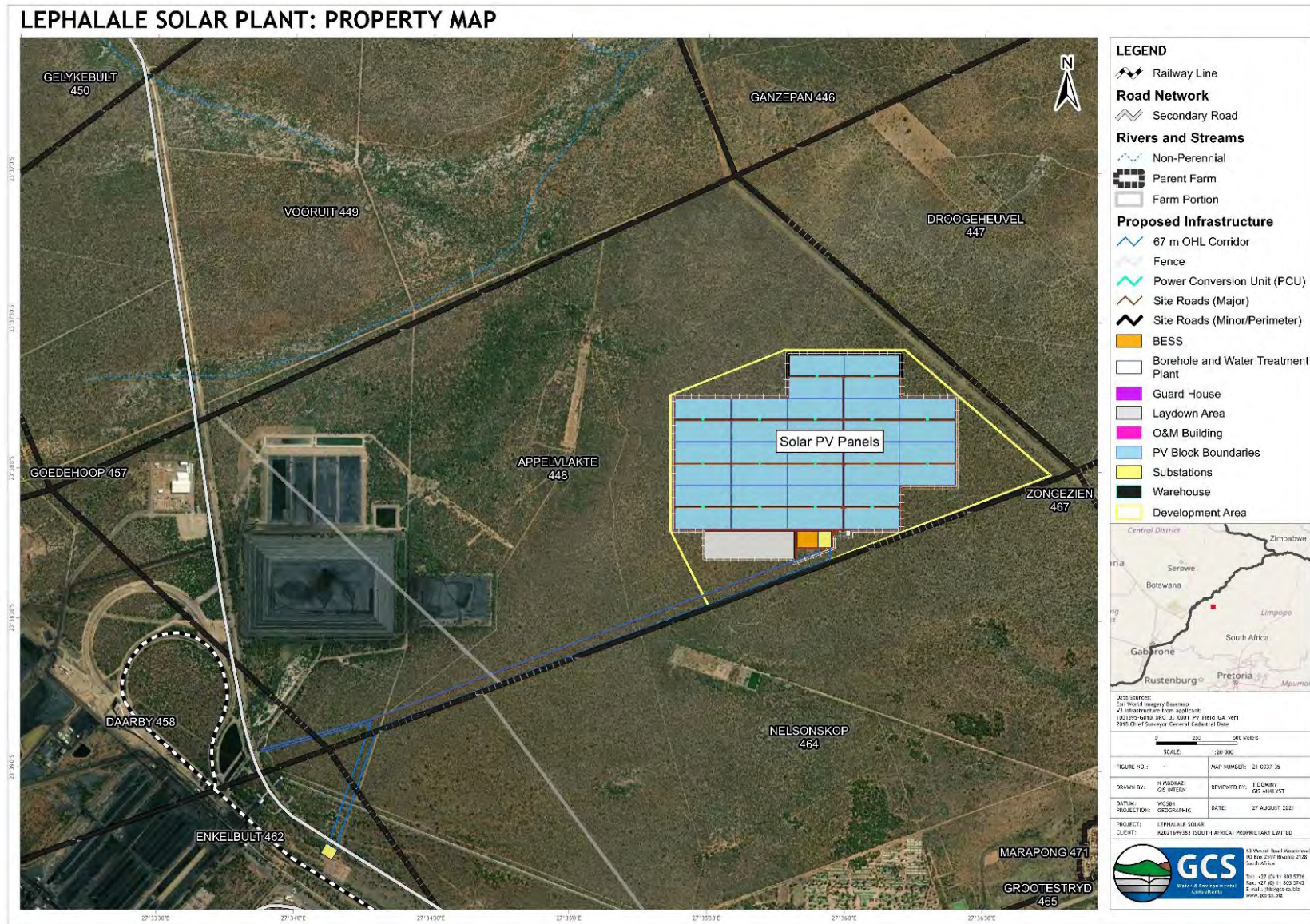


Figure 2: Site layout and affected properties

Ancillary infrastructure (the proposed access road, proposed overhead 132kV powerline, and the existing Grootegeluk 33 kV substation) is located on the following surrounding farms:

- Remainder of Appelvlakte 448 LQ;
- Portion 1 of Appelvlakte 448 LQ;
- Daarby 458 LQ;
- Portion 1 Nelsonkop 464 LQ; and
- Enkelbult 462 LQ.

Based on the nature of the project and the results of the online screening tool and the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998 (Act No, 107 of 1998) (NEMA), when applying for EA (GN R320 of 20 March 2020), the following specialist studies were commissioned:

- Air Quality Impact Assessment;
- Ecology Impact Assessment;
- Heritage and Paleontological Impact Assessment;
- Geohydrological Impact Assessment;
- Surface Water Impact Assessment;
- Socio-Economic Assessment;
- Soils, Land Capability, and Land Use Assessment;
- Traffic Assessment; and
- Visual Impact Assessment.

1.1 Purpose of the EMPr

Section 19 of the NEMA Environmental Impact Assessment (EIA) Regulations of 2014, as amended (GN R982 in GG 38282, December 2014), requires that the Applicant submit an EMPr to the Competent Authority. This EMPr will form part of the EA for the Lephalale Solar Plant, once approved.

The EMPr is an important environmental management tool, developed in line with best practices under NEMA and other environmental legislation, and informed by the EAP's professional experience as well as any relevant specialist information. The EMPr provides management guidance for activities undertaken at the development site. If correctly followed,

the EMPr ensures that any adverse environmental impacts which could result from the development are adequately managed and mitigated.

The EMPr outlines all environmental management and monitoring actions required throughout the project lifecycle. The EMPr is legally binding and any person who contravenes the provisions herein is liable for imprisonment or a fine. This document should be viewed as “live” and thus, should be updated as and when necessary. The purpose of this document is therefore to guide environmental management throughout the various lifecycle phases of the proposed development.

The objectives of the EMPr are as follows:

- Ensure compliance with the relevant environmental legislation and conditions of the EA;
- Ensure that development activities are appropriately managed;
- Verify environmental performance through information on impacts as they occur;
- Respond to changes or unforeseen events; and
- Provide feedback on the continual improvement in environmental performance.

It is understood that all contract documentation related to the construction, operation and decommissioning (if required) of the proposed development will include the conditions of the EA and provisions of the EMPr. It is important to note that the contractual obligations must include the recording of any complaints on the project in the environmental register. Further, it is incumbent on the ECO to keep an accurate audit trail showing compliance with the EMPr during the construction phase.

This EMPr will remain a dynamic document throughout the life of the project. Once the EA has been issued by LDEDET, the EMPr must be updated to include the specific conditions in the EA, as well as any required monitoring or reporting requirements of LDEDET.

1.2 Content of the EMPr

According to Appendix 4 of the NEMA EIA Regulations of 2017, as amended (GNR 326 in GG 40772, April 2017), the EMPr for a project must include certain information. Table 1 describes how this report meets those requirements.

Table 1: Contents of this Environmental Management Programme (EMPr)

REQUIREMENT	SECTION IN THIS REPORT
Details of— (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 1.3 and Appendix A
A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 1.7
A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Figure 3
A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including— (i) Planning and design; (ii) Pre-construction activities; (iii) Construction activities; (iv) Rehabilitation of the environment after construction and where applicable post-closure; and (v) Where relevant, operation activities;	Section 5
A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated above will be achieved, and must, where applicable, include actions to— (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Comply with any prescribed environmental management standards or practices; (iii) Comply with any applicable provisions of the Act regarding the closure, where applicable; and (iv) Comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Section 5
The method of monitoring the implementation of the impact management actions;	Section 5

The frequency of monitoring the implementation of the impact management actions;	Section 5
An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 5
The time periods within which the impact management actions must be implemented;	Section 5
The mechanism for monitoring compliance with the impact management actions;	Section 5
A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 5
An environmental awareness plan describing the manner in which— (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 4.15 Section 5
Any specific information that may be required by the competent authority.	NA

1.3 Details of the EAP

The details of the EAP who prepared this report can be found in Table 2. The EAP CV and registrations are attached as **Appendix A**.

Table 2: Details of the EAP

Name of representative of the EAP	Education qualifications and Registrations	Experience in environmental assessments (yrs)
Natalie Way-Jones	<p>BSc (Hons) Environmental Management and Biotechnology</p> <p>MPhil Environmental Management</p> <p>Pr. Sci. Nat (Environmental Science) 400026/07 - South African Council of Natural Scientific Professionals (SACNASP)</p> <p>Environmental Assessment Practitioner - 253-2020 - Environmental Assessment Practitioners Association of South Africa (EAPASA)</p>	19 years

1.4 Details of the Applicant

The applicant is K2021699383 (South Africa) (Pty) Ltd. The relevant contact details for the applicant are provided in Table 3.

Table 3: Details of the Applicant

Company Name	K2021699383 (South Africa) (Pty) Ltd
Contact Persons	Tracey Achterberg
Telephone No.	083 609 0183
Facsimile No.	-
E-mail Address	Tracey.Achterberg@exxaro.com
Postal Address	The Connexion, 263 West Avenue, Die Hoewes, Centurion, 0157

1.5 Assumptions and Limitations

This EMPr has been drafted with the acknowledgement of the following assumptions and limitations:

- Information used to guide the development of this EMPr was gained during the site visit, through the national web-based screening tool, through specialist input and using the EAP's experience in such developments;
- Note that a development envelope is proposed to allow for the micro-sitting of the associated infrastructure during the detailed engineering phase of the project (i.e., post-EA); and
- The mitigation measures recommended in this EMPr document are based on the preliminary risks/impacts identified in the FSR. These impacts were identified according to the activities described and the known receiving environment. The risks will have to be reassessed and mitigation measures updated accordingly based on further detailed impact assessment in the EIA phase.

1.6 Applicable legislation, policy and best practice guidelines

The EMPr has been developed using knowledge of relevant national, provincial and local legislation and policy as well as best practice guidelines. The Applicant is bound to comply with the legislation and policy provisions throughout the life cycle of the project. Table 4 lists the relevant legislation and guidelines applicable to the development.

The environment is considered to be composed of biophysical, ecological, economic and social components. Construction is a disruptive activity, and all due consideration must be given to the environment, including the social environment during the execution of the project to minimize negative impacts on affected parties. Minimisation of areas disturbed by construction activities (i.e. the footprint of the development area) should reduce many of the construction-related environmental impacts of the project and reduce rehabilitation requirements and costs. All relevant standards relating to international, national, provincial and local legislation, as applicable, should be adhered to. This includes requirements relating to waste generation and emissions, waste disposal practices, noise regulations, road traffic ordinances, etc. Every effort should be made to minimize, reclaim, and/or recycle waste materials.

Table 4: Applicable legislation, policy and best practice guidelines

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
The Constitution of the Republic of South Africa (Act 108 of 1996)	<p>The Constitution is the supreme act to which all other acts must speak to and sets out the rights for every citizen of South Africa and aims to address past social injustices. With respect to the environment, Section 24 of the constitution states that:</p> <p>“Everyone has the right:</p> <ol style="list-style-type: none"> a) To an environment that is not harmful to their health or well-being; b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: <ol style="list-style-type: none"> i. Prevent pollution and ecological degradation; ii. Promote conservation; and iii. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”. 	The Applicant must ensure that environmental impacts are avoided, mitigated or managed as far as possible throughout the life cycle of the project.
Environmental Conservation Act (73 of 1989) (ECA), as amended	<p>The ECA has now largely been replaced by the NEMA but certain provisions remain in force.</p> <p>Section 21 of the ECA relates to the control of activities that may have a detrimental effect on the environment, which require written authorization issued by the relevant authority.</p> <p>The national Noise Control Regulations (NCR) (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCR) were promulgated In terms of Section 25 of the ECA, relating to noise, vibration and shock. The NCRs were revised under Government Notice Number R55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations. In accordance with the Act, two procedures exist for assessing and controlling noise, respectively:</p> <ul style="list-style-type: none"> • South African National Standard (SANS) 10328:2008 Methods for environmental noise impact assessments; • SANS 10103:2004 ‘The measurement and rating of environmental noise with respect to annoyance and speech communication’; and • Other SANS. 	The proposed development is likely to increase ambient noise levels during the construction (temporary) and operational phases. Noise impacts are closely related to construction activities and heavy traffic volumes. The EMPr includes mitigation measures relating to the mitigation of noise impacts.
National Environmental Management Act (Act 107 of 1998)	Framework law giving effect to the constitutional environmental right. Provides the framework for regulatory tools in respect of environmental	Applicable listed activities identified in terms of the 2014 NEMA EIA Regulations, as amended, are:

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
(NEMA), as amended	<p>impacts. Section 24 of NEMA regulates environmental authorisations.</p> <p>Section 28(1) states that “Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment” .</p>	<ul style="list-style-type: none"> • Listing Notice 1, Activity 11; • Listing Notice 1, Activity 24; • Listing Notice 2, Activity 1; • Listing Notice 2, Activity 4; • Listing Notice 2, Activity 15. <p>As such, a S&EIA process must be followed to obtain the necessary EA in terms of the NEMA.</p> <p>The Applicant must ensure that environmental impacts are avoided, mitigated or managed as far as possible throughout the life cycle of the project.</p>
National Environmental Management: Waste Act (Act 59 of 2008) (NEM: WA), as amended	<p>Regulates inter alia the duty of care, management, transport and disposal of waste. Section 16(1) of the NEM: WA provides that:</p> <p>“A holder of waste must, within the holder’s power, take all reasonable measures to -</p> <ol style="list-style-type: none"> a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated; b) reduce, re-use, recycle and recover waste; c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through the noise, odour or visual impacts; e) prevent any employee or any person under his or her supervision from contravening this Act; and f) prevent the waste from being used for an unauthorised purpose.” <p>The NEM: WA also provides for a licensing regime specific to waste management activities.</p> <p>The 2013 Waste Classification and Management Regulations specify waste classification and disposal to landfill for various types of wastes.</p> 	<p>While no Waste Management Licence is required for this development, the Applicant must ensure that waste is appropriately managed throughout the life cycle of the project.</p> <p>Waste generated on site will be sorted and separated into appropriate containers and or prepared areas. All waste will be collected and transported to licensed waste disposal sites through registered service providers.</p> <p>Hazardous waste, such as cement bags, will be handled by a hazardous waste contractor and disposed of to licenced landfill site.</p>
National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM: AQA), as amended	<p>Regulates activities which may have a detrimental effect on ambient air quality including certain processes and dust-generating activities.</p> <p>The NEM: AQA Dust Control Regulations (1 November 2013). prescribe dust fallout rates for residential and non-residential areas. For activities where the dustfall standard is</p>	<p>An Air Emissions Licence will not be required, however, a duty of care should be employed during construction to minimise air pollution as far as possible. The Applicant must take all reasonable measures to minimise the generation of dust and</p>

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
	exceeded, a dustfall monitoring report must be compiled and submitted.	ensure compliance with the Dust Control Regulations.
National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM: BA)	<p>The Act aims for the management of all biodiversity within South Africa. The 2007 Threatened or Protected Species Regulations (GN R150, as amended) provides protection through a permit system as well as through the identification of restricted activities. If required, the relevant permits will be applied for.</p> <p>The Act also provides for duty of care with regards to control of alien species and provides a listing of threatened or protected ecosystems and species in one of the following four categories: critically endangered (CR), endangered (EN), vulnerable (VN), protected (species only), and least threatened (LT).</p> <p>The NEM: BA Alien and Invasive Species Regulations (Government Notice 590 of August 2014) categorises the different types of alien and invasive plant and animal species and how they should be managed:</p> <ul style="list-style-type: none"> • Category 1a Listed Invasive Species - species that must be combatted or eradicated; • Category 1b Listed Invasive Species - species that must be controlled; • Category 2 Listed Invasive Species - species that require a permit and must not be allowed to spread outside of the designated area; and • Category 3 Listed Invasive Species - species which are subject to exemptions in terms of the section requiring a permit, but where such a species occurs in riparian areas, must, for these regulations, be considered to be a Category 1b Listed Invasive Species and must be managed according to regulation 3. 	<p>Various protected tree species were identified on site. A permit will be required from the Natural Resources Management section of the Forestry Management Branch of DFFE to remove or relocate protected species. These include:</p> <ul style="list-style-type: none"> • <i>Boscia albitrunca</i> (Shepherds Tree); • <i>Sclerocarya birrea subspecies caffra</i> (Marula); • <i>Spirostachys africana</i> (Tamboti); and • <i>Vachellia erioloba</i> (Camel Thorn). <p>An upfront count and GPS mapping of affected protected trees will be undertaken by a qualified botanist to assess relocation and permitting requirements. The requirements for tree replacement and replanting are to be confirmed with DFFE.</p> <p>The Applicant must control and eradicate alien and invasive species in line with the NEM: BA Alien and Invasive Species Regulations.</p>
Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA)	The purpose of CARA is to ensure that natural agricultural resources of South Africa are conserved through maintaining the production potential of land, combating and preventing erosion, preventing the weakening or destruction of water sources, protecting vegetation, and combating weeds and invader plants. Most of the provisions are accounted for in more recent legislation such as NEM: BA and NEMA and no applications are required in terms of CARA.	Measures to mitigate potential impacts on agricultural resources, such as soil erosion, alien invasion and protection of vegetation and water resources are included in the EMPr, which will be updated in the EIA phase.

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
National Water Act (Act 36 of 1998) (NWA)	<p>Section 2 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides for the protection, use, development, conservation and control of water resources while ensuring:</p> <ul style="list-style-type: none"> • Promoting sustainable use of water; • Protection of aquatic and associated ecosystems and biological diversity; and • Reducing and preventing pollution and degradation of water resources. <p>Sections 12 -20 of the NWA include provisions relating to the protection of water resources, including the water reserve and water quality. Section 13 relates to the establishment of water quality objectives, including:</p> <ul style="list-style-type: none"> • The presence and concentration of particular substances in the water • The characteristics and quality of the water resource and the in-stream and riparian habitat • The characteristics and distribution of aquatic biota • The regulation and prohibition of in-stream and land-based activities which may affect the quantity and quality of the water resources <p>Section 19 of the NWA provides for pollution prevention and requires that a person who owns, controls occupies or uses the land in question, is responsible for taking reasonable measures to prevent pollution of water resources. A catchment management agency may take action to prevent or remedy the pollution and recover all reasonable costs from the responsible party. The 'reasonable measures' which have to be taken may include measures to:</p> <ul style="list-style-type: none"> • Cease, modify or control any act or process causing the pollution; • Comply with any prescribed waste standard or management practice; • Contain or prevent the movement of pollutants; • Eliminate any source of pollution; • Remedy the effects of the pollution; and • Remedy the effect of any disturbance to the bed and banks of a watercourse". 	<p>Specialist studies have confirmed that there are no natural watercourses or wetlands located within the study area.</p> <p>A separate water use authorisation process in terms of the NWA for the various identified water uses associated with this project will be undertaken simultaneously with this environmental assessment process.</p> <p>Water uses associated with the proposed solar plant include:</p> <ul style="list-style-type: none"> • 21 (a) - related to the abstraction of water from borehole (borehole will also need to be registered with DWS); • 21 (g) - Storage of sewage in a conservancy tank. <p>Consultation with the DWS has confirmed that the water uses fall within the General Authorisation (GA) limits. A GA application is being undertaken with the DWS</p>

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
	<p>“Pollution may be deemed to occur when the following are affected:</p> <ul style="list-style-type: none"> • The quality, pattern, timing, water level and assurance of instream flow; • The water quality, including the physical, chemical and biological • Characteristics of the water; • The character and condition of the in-stream and riparian habitat; • The characteristics, condition and distribution of the aquatic biota” . <p>Section 21 of the NWA recognises and defines water uses that require the approval of the Department of Water and Sanitation (DWS) in the form of a General Authorisation or Water Use Licence (WUL). There are restrictions on the extent and scale of identified activities, determined through a risk assessment, for which General Authorisations apply.</p>	
The National Heritage Resources Act (Act 25 of 1999) (NHRA)	In terms of the NHRA, any person who intends to undertake “any development ... which will change the character of a site exceeding 5,000 m2 in extent”, “the construction of a road...powerline, or pipeline...exceeding 300 m in length” must at the very earliest stages of initiating the development notify the responsible heritage resources authority, namely the South African Heritage Resources Agency (SAHRA) or the relevant provincial heritage agency.	<p>A Phase 1 Heritage Assessment including a desktop paleontological assessment was undertaken. No sites of cultural or heritage significance were identified within the study area.</p> <p>The HIA report will be submitted to the heritage authorities via the online South African Heritage Resources Information System (SAHRIS).</p>
National Road Traffic Act (93 of 1996) (NRTA), as amended	The NRTA intends to provide for road traffic matters which shall apply uniformly throughout the Republic and for matters connected therewith. The NTRA was established in order to manage and control the use of South African roads and in order to ensure that the vehicles and drivers that operate on these roads are safe and competent.	A TIA has been compiled which assesses the traffic impact of the proposed development and provides input with regard to route planning and road upgrades. The various road authorities have been consulted during the Scoping phase and will be provided with an opportunity to comment on the environmental application.
National Veld and Forest Fire Act (101 of 1998)	The purpose of the Act is to prevent and combat veld, forest and mountain fires throughout South Africa. The Act applies to the open countryside beyond the urban limit and puts in place a range of requirements. The Act sets out the responsibilities of landowners or persons in control of the land which includes:	<p>The proposed solar plant site is located in the countryside beyond the urban limit, and thus the provisions of the Act are applicable.</p> <p>Measures to mitigate the risk of veld fires have been included in this EMP.</p>

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
	<ul style="list-style-type: none"> • Prepare firebreaks on their side of the boundary if there is a reasonable risk of veld fire; • Have such equipment, protective clothing and trained personnel for extinguishing fires as are prescribed (in the regulations); • If there are no regulations, reasonably required in the circumstances, take all reasonable steps to notify the FPO of the local FPA (if there is one) when a fire breaks out; and • Do everything in their power to stop the spread of the fire. 	A fire break will be maintained between the plant fence and the perimeter fence.
Spatial Planning and Land Use Management Act (Act 16 of 2013) (SPLUMA)	SPLUMA aims to provide a uniform system of spatial planning and land use management throughout the country. SPLUMA places emphasis on the fundamental role municipal planning and municipalities have on effective spatial planning and development. Based on the above use is primarily governed by the applicable land use or zoning scheme and land may not be used in contravention of such a scheme. Despite any issued environmental authorisation, activities can only be executed on land with the appropriate zoning permitting such activities.	The proposed solar plant site falls outside the town planning scheme and no zoning is applicable. SPLUMA informs the development principles for the proposed solar plant project.
Subdivision of Agricultural Land Act (70 of 1970) (SALA)	The purpose of this Act is to control the subdivision and, in connection therewith, the use of agricultural land.	Applications should be made to the provincial Department of Agriculture and Rural Development to allow for long term leases, the subdivision or rezoning of agricultural land, as well as other prohibited actions in terms of the Act. An application will be submitted to LDARD for authorisation following the conclusion of the EIA process should it be required. LDARD has been included in the EIA process to obtain preliminary comment as part of the process.
Carbon Tax Act (Act 15 of 2019)	Regulates and guides the imposition of taxes on businesses or organisations in relation to their carbon emissions.	The Applicant must adhere to the reporting stipulations within the Act.
Occupational Health and Safety Act (Act 85 of 1993) (OHSA) Regulations for Hazardous Chemical	Makes provision to protect the health and safety of employees at work or others affected by activities undertaken by businesses or industries.	The Applicant must adhere to the stipulations within the Act throughout the lifecycle of the activity. Contractors must comply with the Construction Regulations which lay

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
Substances (GN R1179, 1995) 2014 Construction Regulations		out the framework for construction-related activities.
Hazardous Substances Act (Act 15 of 1973)	<p>Hazardous Substances Act aims to control the production, import, use, handling and disposal of hazardous substances. Under the Act, hazardous substances are defined as substances that are toxic, corrosive, irritant, strongly sensitising, flammable and pressure generating under certain circumstances and may injure, cause ill-health or even death in humans.</p> <p>Where hazardous substances from any of the 4 groups below are to be used, (see below) care must be taken to ensure that or sourced from a licensed sourced, transported, handled and disposed of in compliance with the provisions of the Act.</p> <ul style="list-style-type: none"> • Group I: industrial chemicals (IA) and pesticides (IB); • Group II: 9 classes of wastes excluding Class 1: explosives and class 7: radioactive substances; • Group III: electronic products and group; and • Group IV: radioactive substances. <p>The list of group IA hazardous substances is provided in the Act.</p>	Hazardous substances may be stored, handled or transported as part of the proposed project and include diesel and other liquid fuel, oil and hydraulic fluid, cement, etc.
Lephalale Local Municipality Waste Management By-Law, 30 June 2011	<p>The by-law aims to protect the environment by providing measures for:</p> <ul style="list-style-type: none"> • Ensuring that waste management, including the storage, collection, transportation, treatment and disposal of waste, is undertaken comprehensively and sustainably; • Minimising the consumption of natural resources; • The minimisation of the generation of waste; • The reuse and recycling of waste; and • The safe disposal of waste. <p>Note that this by-law only applies to non-hazardous waste.</p>	<p>A central waste collection and storage area is proposed as part of the solar plant.</p> <p>Waste generated on site will be sorted and separated into appropriate containers and or prepared areas. All waste will be collected and transported to licensed waste disposal sites through registered service providers.</p>

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
EIA Guideline for Renewable Energy Projects (DEA, 2015)	To facilitate the development of the first phase Independent Power Producers (IPPs) procurement programme in South Africa, these guidelines have been written to assist project planning, financing, permitting, and implementation for both developers and regulators. This guideline aims to ensure that all potential environmental issues pertaining to renewable energy projects are adequately and timeously assessed and addressed as necessary to ensure the sustainable roll-out of these technologies by creating a better understanding of the environmental approval process for renewable energy projects.	The proposed development is a renewable energy project (PV Power Plant).
Limpopo Environmental Management Act (Act No. 7 of 2003)	This Act provides the lists for Protected and Specifically Protected Species under Schedule 2, 3 and 12 as well as the stipulation for a permit application to remove these species. In addition, it gives protection measures for the terrestrial and aquatic biota and systems. Schedule 9 lists aquatic plant species that are prohibited in the province.	An upfront count and GPS mapping of affected protected trees will be undertaken by a qualified botanist to assess relocation and permitting requirements. The requirements for tree planting are to be confirmed with DFFE. Should additional protected species be identified during the construction process, permits must be obtained prior to removal.
Limpopo Conservation Plan version 2, 2013	This conservation plan is consistent with the principles of national legislation and is designed to support integrated development planning and sustainable development by identifying an efficient set of Critical Biodiversity Area (CBAs) and Environmental Support Areas (ESAs) that are required to meet national and provincial biodiversity objectives, in a configuration that is least conflicting with other land uses and activities. Quantitative targets were set for all biodiversity features to assess the degree to which the identified CBA network sufficiently included all targets for biodiversity features was evaluated and reported on.	The entire study area falls within an area classified as part of the ESA 1 in terms of the Limpopo Conservation Plan version 2, 2013. Cognisance must be taken of the various management measures within the provincial and/or municipal plans.
Limpopo Environmental Outlook Report, 2016 (LEO)	The LEO Report provides a moment to take stock of and assess the current state or condition of the environment, in general, and environmental resources, in particular. It identifies and assesses environmental issues and challenges, determines the condition and trends, and identifies priority environmental challenges and trends in resource use. It evaluates the effectiveness of environmental policies, strategies, plans, programmes, projects and actions that are in place. It also looks into the future and presents appropriate responses to improve the status quo. It highlights how a range of interrelated measures	In accordance with LEO, the Limpopo Green Economy Plan (LGEP) (LEDET, 2013) identified the potential to develop renewable energy through concentrated solar plants with generation capacity of no less than 100 MW, which is in line with the proposed project proposal.

LEGISLATION/ GUIDELINES	DESCRIPTION	APPLICABILITY
	may either enhance or undermine the environmental resilience of Limpopo.	
Waterberg Environmental Management Plan, 2006 (WEMP)	This management plan provides for the protection of the environment and describes how activities that have, or could have, an adverse impact on the environment, should be managed, mitigated, controlled and monitored. The management plan is a coarse-scale planning tool that outlines strategic objectives for environmental management. All new developments in the Waterberg District Municipality should be aligned with these environmental management objectives.	The purpose of this EMPr is to ensure that the extent of the impact of the project's implementation is minimised, to ensure rehabilitation of disturbed areas and to prevent long term environmental degradation, all in line with the objectives of the WEMP.
Draft Environmental Management Framework for the Waterberg district, 2010 (DEMFWD)	The aim of the Environmental Management Framework (EMF) is to support decision making in the Waterberg District Municipality area to facilitate appropriate and sustainable development. The EMF integrates policies and frameworks and aligns government mandates to streamline decision-making and improve cooperative governance. The EMF has several specific objectives, which include identifying the status quo, development pressures and trends in the area and development of a decision support system for development in the area to ensure that environmental attributes, issues and priorities are taken into account.	The proposed project is in line with the environmental guidelines and priorities of the DEMFWD, with specific reference to potential reduction in the air pollution potential of the District.
Lephalale Draft Spatial Development Framework (SDF), 2017	The spatial development framework was compiled by the Lephalale Municipality to guide the form and location of future physical development within the municipal area to address imbalances of the past. The plan identifies environmentally sensitive areas (e.g. mountain ridges, riverine environments, etc.) and makes recommendations regarding proposed developments in these areas.	Cognisance must be taken of the SDF's goals and objectives expressed spatially through strategies designed to address physical, social and economic defects.

1.7 Aspects of the activity that are covered by the EMPr

The proposed Lephalale Solar plant comprises various aspects which fall within the 256 ha development area and which are the subject of this EMPr. These are outlined in this Section.

The Global Positioning System (GPS) coordinates of the proposed solar plant are provided in Table 5.

Table 5: GPS coordinates

	Latitude	Longitude
Site Centre point	23° 37' 56.95" S	27° 35' 57.79" E
Site Corner points	23° 37' 44.80" S	27° 35' 21.73" E
	23° 37' 35.63" S	27° 35' 46.46" E
	23° 37' 35.59" S	27° 36' 12.85" E
	23° 38' 00.60" S	27° 36' 44.57" E
	23° 38' 27.07" S	27° 35' 30.13" E
	23° 38' 12.07" S	27° 35' 21.80" E
Access Road Start	23° 38' 56.68" S	27° 33' 52.70" E
Access Road Middle	23° 38' 50.07" S	27° 34' 17.15" E
Access Road End	23° 38' 24.88" S	27° 35' 28.67" E
Powerline Start	23° 39' 16.04" S	27° 34' 16.04" E
Powerline Middle	23° 38' 52.20" S	27° 34' 18.09" E
Powerline End	23° 38' 27.01" S	27° 35' 30.08" E

1.7.1 Solar PV Field

- **Solar PV panels** - raised approximately 1.5 m above natural ground level and will make provision for a single-axis tracking system (preferred option) allowing maximization of solar energy harvesting (maximum tilt height of 4 m). The panels will be connected by electrical cables and connected to inverter stations via low voltage underground direct-current cables;
- **Steel support structure and tracker system** on concrete foundations or screw or pile foundations;
- **Inverter stations** on concrete pads;
- **Transformers, switchgear and related equipment;** and
- **Internal roads** - ≤ 10 km of ≤ 4 m wide gravel or dirt roads internal service roads within the plant boundary, including road signage, stormwater channels and drainage controls. The internal roads will allow for maintenance, inspections, and panel cleaning during the operational phase. The exact design and location of the internal

roads will be finalised during the detailed engineering phase of the project (i.e., post-EA).

1.7.2 *Associated infrastructure*

- **Substation complex (33/132 kV)** including control rooms and grid control yards; ≤ 2 ha in extent with a maximum height of 30 m. The substation complex will allow for conversion and step-up of the electricity generated by the PV facility to a grid suitable power supply. The medium voltage side of the substation complex is referred to as a “collector substation”. The high voltage side of the onsite substation complex is referred to as “switching substation” as it acts as a switch to evacuate the electricity into the 132 kV transmission line. The substation complex will include transformers, measurements equipment, feeder bay, control rooms and grid control yards for the Independent Power Producer (IPP)/owner (a concrete single-storey building that houses switch gears);
- **Internal underground/sub-surface 33kV powerlines** will feed into the proposed tie-in substation;
- **132kV overhead transmission lines (OHL) and transmission towers** - ± 4 km long evacuation powerlines that will follow a 67 m wide corridor (extent of the corridor is approximately 25 ha, main access road to the facility) along the southern boundary of the fence line - connect the existing Eskom/Grootegeeluk Main 33kV substation to the Grootegeeluk 33 kV substation located approximately 4 km south-west of the proposed development site;
- **Battery Energy Storage System (BESS)** adjacent to the substation complex will be housed with associated operational, safety and control infrastructure, including monitoring units and the plant controller. The BESS will have container heights of 5 m (with lightning masts of 20 m) and 2,700 m³ of batteries. The 100 megawatt-hour (MWh) BESS will store the electricity generated and allows for the use of stored energy during peak demand periods;
- **Operations and maintenance buildings** with ablutions including:
 - Workshops;
 - Small storage areas for materials and spare parts for use on site for maintenance activities during the operation phase;
 - Single storey brick building with control room, offices, ablution facilities and kitchen for staff, security and visitors;
 - Security building at the entrance of the proposed site with ablution facilities;
 - Water storage tanks;
 - Small diameter water supply pipeline connecting existing boreholes or existing pipeline access points to storage;
 - Central waste collection and storage area - The waste generated during the

construction phase will be mainly packaging, general construction and domestic waste; however, the majority of waste produced during operation is domestic waste. Waste generated on site will be sorted and separated into appropriate containers and or prepared areas. All waste will be collected and transported to licensed waste disposal sites through contracts with registered waste companies. The waste may not necessarily be stored on site during the operational phase; and

- Parking facilities.
- **Water Treatment Plant** (to treat water for potable supply and washing of solar panels)- Water will be sourced from a borehole(s) on site as well as from the mine to make up the demand during the construction and operational phases of the project. Borehole water will be treated at the treatment plant to supply the domestic demands of personnel during the operational phase. The water will further undergo demineralization prior to being used for washing the solar panels. During plant operation the brine from the water treatment plant will be collected and disposed of off-site at a suitable, licensed facility. Note that potable water will be provided separately for domestic water consumption demands by personnel during the construction phase;
- **Borehole** (to supply water during the operational phase for the washing of the solar panels) - Drilling of one water borehole of approximately 60 metres. The hole will be drilled to 6.5-inch diameter and will have a 5-inch slotted casing across the water zone. Solid 5-inch casing through the unconsolidated material (top ~ 18 metres). Headworks - sanitary seal and concrete block with lockable cap;
- **Water tanks** - water tanks sufficient to store 160 m³ per day will be provided for the first 3 months of construction. Storage of 90 m³/d will be provided for the next 21 months of construction. It is assumed that during the operational phase, 48 hours' supply of water would be available, equating to 36 m³/d storage and thus 36 m³ tank storage;
- **Access road** - construction of a new ≤15 km long, ≤8 m wide gravel access road running from the main Lephalale road to the site. The access road will fall within the proposed 132kV overhead transmission lines corridor, Further consultation with Roads Agency Limpopo is required to confirm the design of this access;
- **Perimeter fencing and security systems** - The perimeter fence will have a perimeter sensor. Other security systems will include closed-circuit television (CCTV) cameras motion sensors and floodlights. There will be a 5 m buffer area between the perimeter fence and any plant equipment. Two fences will be utilised; a plant fence and a perimeter fence, 5m apart. On the inside of the plant fence and the outside of the perimeter fence, vegetation will be limited to grass and will be cut twice a year. In between the plant fence and the perimeter fence a buffer area will be maintained as

a fire break. The road will be outside of the 5 meter area between the internal fence and the outer perimeter fence;;

- **Access control** (gate & security building) at site entrance - 24-hour security service will be required to guard the solar PV facility during the construction and operation phases. Security staff will be stationed in a brick building with ablution facilities at the site entrance;
- **Sewerage infrastructure** - During construction, portable toilets will be used and will be emptied by a tanker and sewage removed from the site for disposal at municipal works. During operation, domestic effluent will be discharged to a buried, concrete conservancy tank, recommended to have a capacity of 25 m³. The tank shall then be emptied weekly by tanker and disposed of off-site at an appropriate facility; and
- **Stormwater infrastructure** - A conceptual stormwater management plan forms part of the Hydrological Assessment. Where required, stormwater infrastructure will be constructed to ensure that stormwater run-off from the site is appropriately managed.

1.7.3 *Temporary Infrastructure - combined maximum size of 10 hectares*

- Concrete batching facility - cement bin, an aggregate bin, an aggregate conveyor and the cement and aggregate batchers;
- Temporary offices for the construction period;
- Construction yard; and
- Laydown area.

1.8 Project Phases and Activities

The proposed Lephalale Solar Plant project will have the following phases which are included within the scope of this EMPr:

Planning and Design Phase activities will include:

- Site design and layout;
- Pre-construction assessment of White-backed Vulture nesting sites (two months before the construction commences);
- Identification of service infrastructure already present in the area;
- Construction planning; and
- Relevant permitting.

Construction phase activities will extend over 24 months and will include:

- Vegetation clearance - part of the fenced construction staging/lay-down area will form the operational lay-down area;

- Construction of ±15 m wide access road;
- Excavation;
- Service infrastructure installation;
- Transport of material and equipment (including the use of abnormal load vehicles for the transport of transformers) including building materials (bricks, sand, aggregate, cement, gravel, sheeting, fencing, etc.);
- Paving and concreting;
- Building; and
- Rehabilitation.

During the operational phase, which will extend over 20 years, activities will include:

- Generation of electricity;
- Maintenance, inspections, and panel cleaning;
- Use of service infrastructure;
- Stormwater Management; and
- Use of roads.

The facility will be in operation for at least 20 years. Should decommissioning be deemed necessary, the decommissioning activities would extend over one year and would include:

- Demolition of structures;
- Decommissioning of service infrastructure; and
- Removal of building rubble.

Throughout the project lifecycle, the construction, operating and decommissioning teams must be prepared for unplanned emergencies or incidents threatening human health or the environment.

1.9 Composite Environmental Sensitivity Map

Based on the results of the desktop assessment and specialist studies, a composite environmental sensitivity map showing the proposed solar plant and associated infrastructure is shown in Figure 3.

Key sensitive features identified within the proposed project footprint through the Scoping process include the following:

- Very High Terrestrial and Aquatic Sensitivity based on the web-based national screening tool owing to the location within National Freshwater Ecosystem Priority

Area (NFEPA). Site investigations have shown that there are no natural watercourses or wetlands within the study area;

- The endangered White-backed Vulture was seen to fly over the study area. Several suitable large nesting trees are present within the study site. The removal of these trees during the construction phase will decrease the nesting habitat;
- The study area falls within ESA 1 in terms of the 2013 Limpopo Conservation Plan (version 2) (LDEDET, 2013); and
- Several protected tree species were identified within the study area. An upfront count and GPS mapping of affected protected trees will be undertaken by a qualified botanist to assess relocation and permitting requirements. The requirements for tree replacement and replanting are to be confirmed with DFFE.

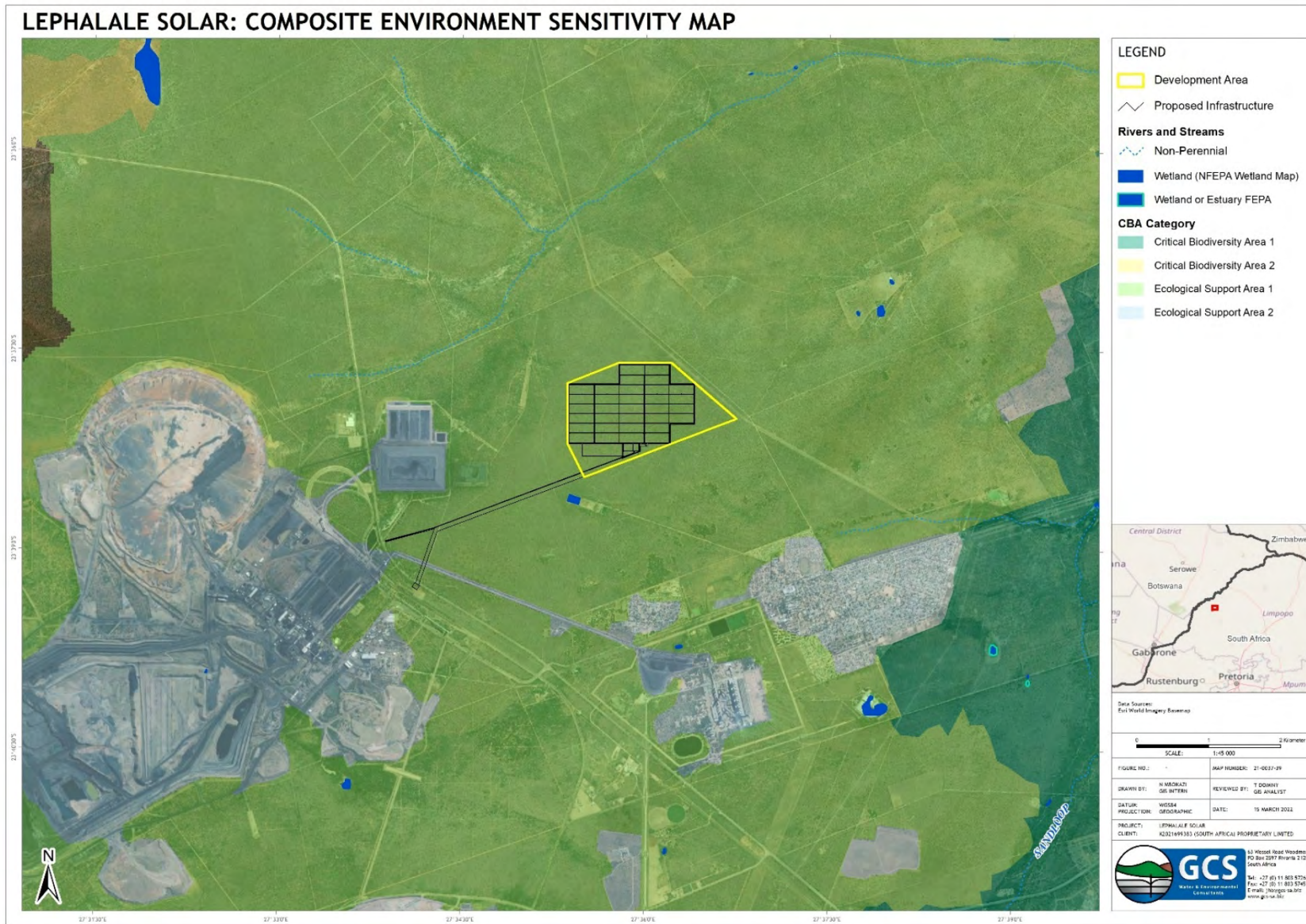


Figure 3: Composite Environmental Sensitivity Map

2 ENVIRONMENTAL IMPACT STATEMENT

Appendix 4 of the 2014 NEMA EIA Regulations, as amended, requires that the EMP include a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development. The results of the impact assessment indicated that the most significant impacts on the receiving environment would be those listed below in Table 6 and Table 7. The correct implementation of the mitigation measures outlined within this document will ensure that all impacts are managed, mitigated or avoided as far as practicably possible.

Table 6: Key impacts during the construction phase

Environmental Aspect	Impacts
Air Quality & Climate	<ul style="list-style-type: none"> • Generation of inhalable PM2.5, PM10 and TSP and impacts on health • GHG emissions during the construction activities
Vegetation	<ul style="list-style-type: none"> • Potential loss of indigenous vegetation units • Potential increase in alien vegetation • Potential loss of floral species of conservation importance • Loss of catchment area and decreased water inputs • Contamination of the area by petrochemical spillages • Contamination of the area by construction and domestic waste • Contamination of the area as a result of leaking portable toilet facilities.
Wildlife	<ul style="list-style-type: none"> • Potential loss of faunal species of conservation importance • Potential loss of vulture breeding habitat (White-backed Vulture) • Potential loss of foraging habitat for game species • Contamination of the area by petrochemical spillages • Contamination of the area by construction and domestic waste • Contamination of the area as a result of leaking portable toilet facilities. • Road Mortalities
Soils, Land Capability and Land Use	<ul style="list-style-type: none"> • Soil Contamination • Soil loss / Soil erosion • Loss of agricultural potential • Temporary change in land use from open veld (zoned for mining) to construction
Water Quality	<ul style="list-style-type: none"> • Increase in water turbidity due to sediment inputs and/or erosion

	<ul style="list-style-type: none"> • Physio-chemical water pollution related to potential spillages of cement and fuels
Visual	<ul style="list-style-type: none"> • Negative visual impact on aesthetics • Change of visual landscape and character • Visual intrusion due to glare, light trespass and skyglow
Noise	<ul style="list-style-type: none"> • Noise disturbance from the movement of construction vehicles • Noise disturbance from the operation of machinery
Heritage & Paleontological Impacts	<ul style="list-style-type: none"> • Loss of cultural heritage resources • Loss of palaeontological resources
Social	<ul style="list-style-type: none"> • Increased annoyance, air quality and noise • Increase in crime • Increased risk of HIV infections • Influx of construction workers • Hazard exposure • Disruption of daily living patterns and social and community infrastructure • Job creation and skills development • Positive economic impacts
Traffic	<ul style="list-style-type: none"> • Increase in traffic • Increase of incidents with pedestrians and livestock • Increase in dust from gravel roads • Increase in road maintenance • Additional abnormal loads • Increase in dust from gravel roads • New / larger access points

Table 7: Key impacts during the operational phase

Environmental Aspect	Impacts
Renewable Energy Goals and Green House Gas Reduction	<ul style="list-style-type: none"> • Contribution to Renewable Energy Goals and Green House Gas Reduction
Vegetation	<ul style="list-style-type: none"> • Spreading of alien invasive vegetation • Loss of catchment area and decreased water inputs • Contamination of the area by petrochemical spillages • Contamination of the area by domestic waste • Contamination of the area as a result of leaking ablation facilities.
Wildlife	<ul style="list-style-type: none"> • Potential increase in the number of bird-strikes along the connection powerline • Potential disruption of open space corridor • Potential loss of foraging habitat for game species

	<ul style="list-style-type: none"> • Contamination of the area by petrochemical spillages • Contamination of the area by domestic waste • Contamination of the area as a result of leaking ablution facilities. • Road Mortalities
Soils, Land Capability and Land Use	<ul style="list-style-type: none"> • Soil contamination • Soil erosion
Water Quality & Quantity	<ul style="list-style-type: none"> • Increase in water turbidity due to sediment inputs and/or erosion • Potential sedimentation several months after the site has been constructed. • Physio-chemical water pollution related to potential spillages / leakages of fuels and oils • Lowering of groundwater levels- groundwater abstraction from BH2 • Lowering of regional groundwater levels within the aquifer • Lowering of the water table due to dewatering
Visual	<ul style="list-style-type: none"> • Landscape visual change • Change of visual character • Visual intrusion due to glare, light trespass and skyglow
Social	<ul style="list-style-type: none"> • Glint & glare • Transformation of the sense of place • Positive economic impacts
Traffic	<ul style="list-style-type: none"> • Increase in dust from gravel roads • New / larger access points

3 ROLES AND RESPONSIBILITIES

The effective implementation of this EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project-specific requirements will ultimately determine the need for the appointment of a specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that if no specific person, for example, an Environmental Control Officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties of the ECO indicated in this document are undertaken. See Table 8.

Table 8: Roles and Responsibilities for Implementation of the EMPr

Responsible Person	Roles and Responsibilities
<p>Developer’s Project Manager (DPM)</p>	<p><u>Role</u> The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). An ECO will be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the EA. The Project Developer is further responsible for providing and giving the mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be fully conversant with the conditions of the EA; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required; - Monitor the implementation of the EMPr throughout the project through site inspections and meetings. Overall management of the project and EMPr implementation; and - Ensure that periodic environmental performance audits are undertaken on the project implementation.
<p>Developer Site Supervisor (DSS)</p>	<p><u>Role</u> The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Ensure that all contractors identify a contractor’s Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
<p>ECO</p>	<p><u>Role</u> The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available</p>

to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and DPM regarding all environmental matters. The Contractor, cEO and developer Environmental Officer (dEO) are answerable to the ECO for non-compliance with the Performance Specifications as set out in the EA and EMPr.

The ECO provides feedback to the DSS and DPM, who in turn reports back to the Contractor and potential and Registered Interested and Affected Parties (I&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Employer's Project Manager and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Employer's Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.

Responsibilities

The responsibilities of the ECO will include the following:

- Be aware of the findings and conclusions of all EA related to the development;
- Be familiar with the recommendations and mitigation measures of this EMPr;
- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;
- Undertake regular and comprehensive site inspections/audits of the construction site according to the generic EMPr and applicable licenses to monitor compliance as required;
- Educate the construction team about the management measures contained in the EMPr and environmental licenses;
- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;
- Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements (to be compiled once detailed designs have been completed);
- In consultation with the DSS order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses;
- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;
- Compile a regular Environmental Audit Report (EAR) highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr;
- Validating the regular site inspection reports, which are to be prepared by the cEO;
- Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;
- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;
- Assisting in the resolution of conflicts;
- Facilitate training for all personnel on the site - this may range from carrying out the training to reviewing the training programmes of the Contractor;

	<ul style="list-style-type: none"> - In the case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.
<p>developer Environmental Officer (dEO)</p>	<p><u>Role</u> The dEOs will report to the DPM and are responsible for the implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the DPM and Contractor’s Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s); - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (or cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management: - Reporting environmental incidents to the developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compiling investigation reports; - Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and/or licenses are in place and up to date; - Acting as Developer’s Environmental Representative on site and working together with the ECO and contractor.
<p>Contractor</p>	<p><u>Role</u> The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described (to be compiled once detailed designs have been completed). External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented (to be compiled once detailed designs have been completed).</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Project delivery and quality control for the development services as per appointment;

	<ul style="list-style-type: none"> - Employ a suitably qualified person to monitor and report to the Project Developer’s appointed person on the daily activities on-site during the construction period; - Ensure that safe, environmentally acceptable working methods and practices are implemented, and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - Attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - Ensure that contractors’ staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
<p>cEO</p>	<p><u>Role</u> Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor’s representative can be the site agent; site engineer; dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor’s Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - Be on site throughout the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements (to be compiled once detailed designs have been completed); - Attend the Environmental Site Meeting; - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; - Report back formally on the completion of corrective actions; - Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

4 ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, several reporting systems, documentation controls and compliance mechanisms must be in place as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated, and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- A full copy of the signed EA from the CA in terms of NEMA;
- Any amendments to the EA;
- Copy of the generic and site-specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site-specific EMPr and amendments thereof;
- All method statements (to be compiled once detailed designs have been completed);
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The dEOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed upon prior to commencement of the activity. The dEOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS weekly. The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the EAR as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs and EOs can assess whether the contractor's proposal is in accordance with the EMPr (to be compiled once detailed designs have been completed).

The method statement must include the following:

- Development procedures;
- Materials and equipment to be used;
- Getting the equipment to and from the site;
- How the equipment/ material will be moved while on site;
- How and where the material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Compliance/ non-compliance with the EMPr; and
- Any other information deemed necessary by the ECO.

Unless indicated otherwise by the Developer's Project Manager, the Contractor shall provide the following method statements to the Developer's Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment - Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substances;
- Vegetation management - Protected, clearing, aliens, felling;
- Access management - Roads, gates, crossings etc.;
- Fire plan;
- Waste management -transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction - complaints management, compensation claims, access to properties etc.;
- Water - use (source, abstraction and disposal), access and all related information, crossings and mitigation;

- Emergency preparedness - Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management - only if the risk was identified - wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The dEOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor must be included in the environmental file. A generic format of a method statement is supplied as Appendix B.

4.6 Environmental Incident Log (Diary)

The dEOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMP) that may be addressed immediately by the ECOs. (For example, a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMP which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The dEOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMP file and at a minimum, the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECO via the DSS or DPM. The non-compliance notices will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action is to be completed.

The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define how the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, there is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site-specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action, the cEO is to issue a Corrective Action Report in writing to the ECO. If satisfied that the corrective action has been completed, the ECO is to sign-off on the Corrective Action Report and attach the report to the non-compliance notice in the EMPr file.

Corrective action is considered complete once the report has been signed off by the ECO.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post-rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated, and a brief description note attached.

The Contractor shall:

- Allow the ECO and EOs access to take photographs of all areas, activities and actions.
- The EOs shall keep an electronic database of photographic records which will include:
 - Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
 - All bunding and fencing;
 - Road conditions and road verges;
 - Condition of all farm fences;
 - Topsoil storage areas;
 - All areas to be cordoned off during construction;
 - Waste management sites;
 - Ablution facilities (inside and out);
 - Any non-conformances deemed to be "significant";
 - All completed corrective actions for non-compliance;
 - All required signage;
 - Photographic recordings of incidents;
 - All areas before, during and post-rehabilitation; and
 - Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

- Record the name and contact details of the complainant;
- Record the time and date of the complaint;
- Contain a detailed description of the complaint;
- Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
- Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described below.

4.11 Claims for damages

If a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

- Record the full detail of the complaint as described above;

- The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
- Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
- A formal record of the response by the EOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with I & APs

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The EOs shall:

- Ensure that all queries, complaints and claims are dealt with within an agreed timeframe;
- Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
- Ensure that complaints telephone numbers are made available to all landowners and affected parties; and
- Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes are included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECO must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Developer's Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On completion of the rehabilitation and/or requirements of the EA, a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

4.15 Environmental Training and Awareness-Raising

The Contractor, sub-contractors and employees require an appropriate level of environmental awareness and competence to ensure continued compliance with environmental legislation, conditions of the EA and the provisions in the EMPr. Training needs should be identified based on the available and existing capacity of site personnel (including all Contractors and sub-contractors) to undertake the required management actions and monitoring activities. All personnel must be adequately trained to perform their designated tasks to an acceptable standard.

Upfront environmental training is aimed at:

- Promoting environmental awareness;
- Informing the main contractor of all environmental procedures, policies and programmes applicable;
- Providing generic training on the implementation of environmental management specifications; and
- Providing job-specific environmental training to understand the key environmental features of the construction site and the surrounding environment.

Training will be offered in the main languages (Afrikaans, Northern Sotho and English). In addition to the upfront environmental training by the ECO, the Contractor should make provision for regular training or "Toolbox Talks".

General environmental awareness must be fostered to ensure that environmental incidents are minimised and there is environmental compliance.

5 PROPOSED IMPACT MANAGEMENT ACTIONS

This section outlines aspects related to the development of the proposed solar plant and associated infrastructure and for each aspect, a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, to mitigate the impact of such aspects.

This must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements are prepared and agreed to by the holder of the EA (to be compiled once detailed designs have been completed - a generic format is supplied as

Appendix B). Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

Appendix 4 of the 2014 NEMA EIA Regulations requires that the EMPr aim to achieve the following through the proposed impact management actions:

- Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
- Comply with any prescribed environmental management standards or practices;
- Comply with any applicable provisions of the Act regarding the closure, where applicable; and
- Comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable.

ASPECT: ENVIRONMENTAL TRAINING - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASES						
Impact management outcome	Impacts on the environment are minimised during site establishment and the development footprint is kept to the demarcated development area.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - All staff must receive environmental awareness training prior to the commencement of the activities; - The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; - Refresher environmental awareness training is available as and when required; - All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their roles and responsibilities in achieving compliance with the EA and EMPr; - The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: <ul style="list-style-type: none"> a) Safety notifications; and b) No littering. - Environmental awareness training must include as a minimum the following: <ul style="list-style-type: none"> a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; 	ECO	Schedule training sessions with all contractors as required prior to construction Document all trainees	Prior to the start of construction activities	ECO cEO dEO	Schedule training sessions with all contractors as required prior to construction	Training register/s Information posters Training materials

ASPECT: ENVIRONMENTAL TRAINING - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASES						
Impact management outcome	Impacts on the environment are minimised during site establishment and the development footprint is kept to the demarcated development area.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; k) Disease prevention; and l) Prevention and containment of spills, leaks and other impacts to watercourses - A record of all environmental awareness training courses undertaken as part of the EMP must be available; - Educate workers on the dangers of open and/or unattended fires; - A staff attendance register of all staff to have received environmental awareness training must be available. - Course material must be available and presented in appropriate languages that all staff can understand.						

ASPECT: SITE ESTABLISHMENT DEVELOPMENT - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASE						
Impact management outcome	Impacts on the environment are minimised during site establishment and the development footprint is kept to the demarcated development area.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Where possible, it is recommended that construction be undertaken during the dry season/winter months (May to September generally) to reduce erosion and sedimentation risks associated with summer rainfall in this region; - Assessment of vulture nesting sites two months prior to construction; - Perimeter fencing and internal security fencing and gates will be installed in accordance with: <ul style="list-style-type: none"> • The Fencing Act (Act 31 of 1963); and • The Fencing Amendment Act, (Act 3 of 1971); - Minimize construction duration; - Limit the construction footprint; - A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp/s in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment 	DPM ECO	<p>ECO to approve method statements (to be compiled once detailed designs have been completed)</p> <p>Approved method statements to be included in the updated EMPr - a generic format is supplied as Appendix B</p> <p>Assessment of vulture nesting sites two months prior to construction</p>	Prior to the start of construction activities	ECO cEO dEO	Prior to construction	Approved method statements included in updated EMPr (to be compiled once detailed designs have been completed - a generic format is supplied as Appendix B)

ASPECT: SITE ESTABLISHMENT DEVELOPMENT - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASE						
Impact management outcome	Impacts on the environment are minimised during site establishment and the development footprint is kept to the demarcated development area.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
cleaning areas ablation facilities (toilets only), waste and wastewater management; <ul style="list-style-type: none"> - Location of camp/s must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walkthrough; - The camp should be established on level ground; - Sites must be located within the specified development footprint and on previously disturbed areas where possible; - The camp/s must be fenced; - Identification of access restricted areas is to be informed by the environmental assessment, site walkthrough, and any additional areas identified during development; - To mitigate the localised visual impact through the stockpiling, storage of equipment and machinery, and the storage of reflective materials, a shade cloth fence can be erected around the construction camp/s. - Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and 						

ASPECT: SITE ESTABLISHMENT DEVELOPMENT - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASE						
Impact management outcome	Impacts on the environment are minimised during site establishment and the development footprint is kept to the demarcated development area.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
- Unauthorised access and development related activity inside access restricted areas are prohibited.						

ASPECT: ACCESS ROADS AND TRAFFIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Minimise impact on traffic mobility and access and minimise the impact on the local road network					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - All contractors must be made aware of all these permissible access routes; - All road material will be sourced from local licensed suppliers and sources. All imported material i.e. sand, gravel shall be sourced from licensed suppliers; - Ensure abnormal vehicles travel to and from the proposed development travel in the 'off peak' periods or stagger delivery; - Construction of gravel road in terms of TRH20; - Adequate road signage according to the South African Road Traffic Signs Manual (SARTSM); - Approval from the respective roads department; - Appropriate, timely and high-quality maintenance required in terms of TRH20; - Implement a road maintenance program under the auspices of the respective transport department; - Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; - Ensure staff transport is done by bus to reduce impact in the peak period; 	DPM Contractor ECO	Training of contractors Road maintenance programme	Prior to the start of construction activities	ECO cEO dEO	Prior to construction	Training registers Photographic records of affected access routes Complaints register Environmental incident register

ASPECT: ACCESS ROADS AND TRAFFIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Minimise impact on traffic mobility and access and minimise the impact on the local road network					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Stagger material, component and abnormal load deliveries; - Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance; - Implementation of pedestrian safety initiatives; and - Regular maintenance of farm fences & access cattle grids. 						

ASPECT: WATER USE AND SUPPLY MANAGEMENT PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Undertake responsible water usage.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Onsite water harvesting measures for rainwater are recommended where possible; - Any abstraction points or boreholes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured daily; - Adhere to pumping schedule and amendment of schedule by a hydrogeologist, if necessary. - It is recommended that the pump inlet be installed at 68 mbgl and that the borehole be pumped at a yield of 0.42 L/s (1500 L/hr) for 12 hours and left to recover for at least 12 hours before pumping commences again. Given this pumping schedule the total volume of water that can be abstracted per day is 18 000 L/day (18.0 m³ /day); - Monitoring of the groundwater levels and quality of the surrounding monitoring boreholes and the production and reserve boreholes; - Ensure water conservation is being practised by: <ul style="list-style-type: none"> a. Minimising water use during the cleaning of equipment; 	DPM Contractor ECO	<p>Keep records of water sources and volumes on site</p> <p>Daily measurements of abstraction volumes, as required</p> <p>Pumping schedule</p>	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	<p>Records of water sources and volumes on site</p> <p>Daily measurements of abstraction volumes, as required</p> <p>Training registers</p> <p>Training materials</p>

ASPECT: WATER USE AND SUPPLY MANAGEMENT PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Undertake responsible water usage.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
b. Undertaking regular audits of water systems; c. Including a discussion on water usage and conservation during environmental awareness training; and d. Possible recycling of greywater is recommended where possible.						

ASPECT: STORMWATER AND WASTEWATER MANAGEMENT - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Impacts on the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Stormwater needs to be attenuated within the development footprint to pre-development levels prior to discharge to the freshwater environment. - There are no bulk water collection points planned, however the stormwater will be attenuated to slow down the flow. - No treatment of storm water is planned. - In terms of general stormwater conveyance, stormwater runoff generated by developed and hardened surfaces should be directed into, and conveyed by, open, impermeable swales rather than into underground piped systems or concrete V-channels wherever feasible and practical. These features should be well vegetated with appropriate species and stabilised using gabion or concrete check walls to prevent erosion and vertical incision. This will provide for some filtration and removal of urban pollutants (e.g. oils and hydrocarbons), provide some attenuation by increasing the time runoff takes to reach low points, and reduce the energy of stormwater flows within the stormwater system through increased roughness when 	DPM Contractor ECO	<p>Compile and implement the approved SWMP</p> <p>Certificates of safe disposal for general, hazardous and recycled waste</p> <p>Record spills/ discharges and environmental incidents</p>	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	<p>Certificates of safe disposal for general, hazardous and recycled waste</p> <p>Complaints register</p> <p>Environmental incident register</p>

ASPECT: STORMWATER AND WASTEWATER MANAGEMENT - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Impacts on the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>compared with pipes and concrete V-drains.</p> <ul style="list-style-type: none"> - Wherever possible, the gradient of bulk collector pipes and discharge pipes should be reduced as far as practically possible to not unnecessarily increase the velocity of flows after onsite attenuation. - Many smaller stormwater outlets must be favoured over a few large outlets. This also applies to roads. - All stormwater outlets must be designed to dissipate the energy of outgoing flows to levels that present a low erosion risk. In this regard, suitably designed energy dissipation (e.g. stilling basins) and erosion protection structures (Reno-mattresses) will need to be installed at appropriate locations. Pre- and post-discharge velocities at each outlet should be calculated to inform the appropriate design of the energy dissipation and erosion protection measures. All erosion protection measures (e.g. Reno-mattresses) must be established to reflect the natural slope of the surface and located at the natural ground level. - Measures to capture solid waste and debris entrained in stormwater runoff must be 						

ASPECT: STORMWATER AND WASTEWATER MANAGEMENT - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Impacts on the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
incorporated into the design of the system and should include the use of either curb inlet/inlet drain grates and/or debris baskets/bags. - All stormwater generated by the medium to high-risk contamination surfaces must ideally receive basic filtering and treatment onsite prior to discharge into the freshwater environment. The higher the watercourse pollution risk, the more stringent the basic treatment methods are. - Runoff from the cement/concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the developer’s project manager. Reuse of this water in the batching plant could be considered; - All spillage of hazardous substances onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; - Sewer pipelines will need to be designed with longevity in mind and to require as little maintenance as possible to ensure the optimal functioning of such systems.						

ASPECT: STORMWATER AND WASTEWATER MANAGEMENT - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Impacts on the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - To reduce the risk of surcharging sewer manholes onsite and downstream, a form of gully trap should be installed at or before the connection of the various components of the development with the mainline. This gully trap will block foreign objects from entering the main internal line of the site and isolate blockage problems at the source. - Buried pipelines containing effluent that can cause pollution. will need to be protected to minimise the risk of damage or leakage. This means typically encasing the pipe in concrete or other suitable resistant material. - The ingress of stormwater into the sewer system is to be prevented as far as possible by ensuring manholes and manhole covers are as watertight as practically possible. - After every rainfall event, the contractor must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled-in with appropriate material and silt fences or fascine work must be established along the gully for additional protection until vegetation has re-colonised the rehabilitated area. 						

ASPECT: STORMWATER AND WASTEWATER MANAGEMENT - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Impacts on the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Regular ongoing maintenance in the form of the silt and debris/litter clearing and removal from catch pits, filtration devices, infiltration trenches, outlet structures, and maintenance and repair of stormwater outlets to ensure the optimal functioning of such systems. - Continuously educate and engage with the employees on how to best care for and protect the functioning of the sewer system (to prevent blockages for example). - Any sewer pipe blockages, leakages and/or manhole surcharges/overflows must be fixed immediately. - Maintenance of pipelines must be undertaken as sensitively as possible to prevent adverse impacts to the environment during access and repairs. - Ensure that incident response and contingency plan is prepared to deal with any potential unforeseen impacts that could arise at the pump station during operation. These may include: <ul style="list-style-type: none"> • Failure of sewer pipeline design/poor construction; • Failure of materials leading to rupture of the sewer pipe and leakage; 						

ASPECT: STORMWATER AND WASTEWATER MANAGEMENT - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Impacts on the environment caused by stormwater and wastewater discharges during construction are avoided.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> • Exposure of sewer pipelines and damage through erosion; and • Unintentional damage by machinery operating near pipelines/manholes. <ul style="list-style-type: none"> - A monitoring and maintenance programme should be prepared to ensure the ongoing performance of infrastructure and the prevention of foreseeable faults/problems that could result in leakage/failure. - Implementation of a stormwater management plan (SWMP) to keep clean water away from dirty areas. - Demarcated dirty areas to be limited to roads, parking areas and chemical storage areas. - Spills to be cleaned up immediately. - Vehicles and equipment to be regularly maintained and cleaned in suitably designed areas, preferably off site. - Grease trap at the outlet of the parking area. 						

ASPECT: SOLID AND HAZARDOUS WASTE MANAGEMENT- PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - All measures regarding waste management must be undertaken using an integrated waste management approach; - Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; - A suitably positioned and demarcated temporary waste collection site must be identified and provided; - The temporary waste collection site must be maintained in a clean and orderly manner and managed in accordance with the National Norms and Standards for the Storage of Waste (GNR.926, November 2013); - Waste must be segregated into separate bins and marked for each waste type for recycling and safe disposal; - Staff must be trained in waste segregation; - Bins must be emptied regularly; - General waste produced onsite must be disposed of at registered waste disposal sites/recycling companies; - Hazardous waste must be disposed of at an appropriately licensed waste disposal site; and 	DPM Contractor ECO	Compile and implement the approved SWMP Certificates of safe disposal for general, hazardous and recycled waste Record spills/ discharges and environmental incidents	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Certificates of safe disposal for general, hazardous and recycled waste Complaints register Environmental incident register Training register Training materials

ASPECT: SOLID AND HAZARDOUS WASTE MANAGEMENT- PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
- Certificates of safe disposal for general, hazardous and recycled waste must be maintained.						

ASPECT: VEGETATION CLEARING - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Indigenous vegetation outside of the designated Works area must be left undisturbed; - Restrict the movement of personnel and construction vehicles to where they are needed; - Remove vegetation in a 'natural manner' when possible, avoiding any harsh lines; - If the project schedule can accommodate the systematic clearance of the indigenous vegetation from the site, this should be included in the construction plan. This will make provision for current work areas to be cleared of indigenous vegetation which will limit the disturbances which will allow the settlement of the alien invasive species; - The existing vegetation bordering the proposed firebreaks - which will be established on either side of the perimeter fence, should be retained as far as possible; - Consult a Botanist/Landscape Architect/Environmentalist to assist with proper vegetation removal procedures; 	DPM Contractor ECO	<p>Demarcation of SCC and sensitive habitats prior to construction</p> <p>Implementation of the approved alien and invasive plant control and eradication plan</p> <p>The daily register must be kept of all relevant details of herbicide usage</p> <p>Certificates of safe disposal for general, hazardous and recycled waste</p>	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	<p>Environmental incident register</p> <p>Training register</p> <p>Training materials</p> <p>Monitoring of success of rehabilitation</p> <p>Records of permits for the relocation of SCC and protected plants</p> <p>Daily register of herbicide usage</p> <p>Certificates of safe disposal</p>

ASPECT: VEGETATION CLEARING - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Strategically plan the location of site camps and laydown areas so that minimal vegetation is cleared; - All disturbed areas should be rehabilitated after the construction phase; - Permits for the damage or removal of protected plant species must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed; - An upfront count and GPS mapping of affected protected trees will be undertaken by a qualified botanist to assess relocation and permitting requirements. The requirements for tree replacement and replanting are to be confirmed with DFFE; - It is important to note that in accordance with the National Forests Act (Act No. 84 of 1998) the removal of the identified tree species can only occur upon the authorisation of a permit to do so. - The number of these trees must be recorded before removal to ensure that an equal number of these species can be replanted during the 		Implementation of the approved alien and invasive plant control and eradication plan				for general, hazardous and recycled waste

ASPECT: VEGETATION CLEARING - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
closure/rehabilitation of the vegetation on the site. <ul style="list-style-type: none"> - The need for collection and germination of seeds for these species are not necessary as all these species can be sourced from nurseries in the area. - Trees felled due to construction must be documented and form part of the EAR; - Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; - A daily register must be kept of all relevant details of herbicide usage; - Alien invasive vegetation must be removed and disposed of at a licensed waste management facility. - The ECO must undertake monthly compliance monitoring audits. Terrestrial ecosystem aspects that must be monitored related to monitoring freshwater ecosystem impacts include: <ul style="list-style-type: none"> - The condition of the demarcations/fence. - Evidence of any no-go area incursions. 						

ASPECT: VEGETATION CLEARING - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION AND OPERATIONAL PHASES						
Impact management outcome	Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - The condition of temporary runoff, erosion and sediment control measures and evidence of any failures or sediment deposits. - Evidence of erosion. - Visual assessment of stormwater quality. - The condition of waste bins and the presence of litter within the working area. - Evidence of solid waste dumping within the no-go areas. - Evidence of hazardous materials spills and soil contamination. - Presence of alien invasive and weedy vegetation within the working area. - Rehabilitation and revegetation methods and success. 						

ASPECT: PROTECTION OF FAUNA PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/DECOMMISSIONING PHASES						
Impact management outcome	Disturbance to fauna is minimised.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - If possible, the construction activities are to commence in the winter months to ensure that the animal species that will actively move from the site is not currently rearing young as the movement with young animals could potentially cause mortality amongst the young animals; - Provision should be made in the project schedule to assess the project area for the presence of any White-backed Vulture nesting sites two months before the construction will commence; - If any nesting sites are observed, these trees should be left untouched during the clearance of the vegetation phase and buffered by a 20m buffer around these trees. Once the young birds have fledged and the birds have left the nests, these trees and the associated buffer vegetation can be cleared. - If no nesting sites are identified during the assessment, all large trees (trees higher than 10m) must be felled directly after the assessment to prevent any settlement of these trees by the vultures. 	DPM Contractor ECO	<p>Demarcation of SCC, sensitive habitats prior to construction</p> <p>Assessment of vulture nesting sites two months prior to construction</p> <p>Records of permits for the relocation of SCC</p>	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	<p>Environmental incident register</p> <p>Training register</p> <p>Training materials</p> <p>Monitoring of success of rehabilitation</p> <p>Records of permits for the relocation of SCC</p>

ASPECT: PROTECTION OF FAUNA PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Disturbance to fauna is minimised.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Provision must be made in the vegetative species mix during the rehabilitation phase of the project site for the planting of trees that will establish large specimens which will act as nesting sites for future vulture communities. - Make provision to have the powerline as low as possible. It is generally accepted that the lower the powerlines are above ground level, a reduction in the risk of bird strikes will take place; and - Provision of line markers along the powerline to make the powerline more visible to birds. - No poaching must be tolerated under any circumstances. All animal dens close to the works areas must be marked as "No-Go" areas; - No deliberate killing of fauna is allowed; - In areas where snakes are abundant, snake deterrents to be deployed; and - No Threatened or Protected species (ToPs) and/or protected fauna as listed according to NEM: BA and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits. 						

ASPECT: PROTECTION OF HERITAGE RESOURCES - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Impact on heritage resources is minimised.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - All work must cease immediately if any human remains and/or other archaeological, palaeontological and historical material are uncovered; - Reporting of heritage findings to the SAHRA. - Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist (or the South African Police Services [SAPS]), so that a systematic and professional investigation can be undertaken; and - Sufficient time must be allowed to remove/collect such material before development recommences. - If any fossils are found, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist. - In the case of the ECO or the Site Manager becoming aware of suspicious-looking palaeo-material: - The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the 	DPM Contractor ECO	Reporting of heritage findings to SAHRA Reporting of graves/ human remains to SAPS	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Environmental incident register Training register Training materials Permits for damage or repairs to heritage sites Records of reports to heritage agencies/ SAPS

ASPECT: PROTECTION OF HERITAGE RESOURCES - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Impact on heritage resources is minimised.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
site and remove the material before excavation continues. - Mitigation will involve the attempt to capture all rare fossils and the systematic collection of all fossils discovered. This will take place in conjunction with the descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labelled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.						

ASPECT: SAFETY OF THE PUBLIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	All precautions are taken to minimise the risk of injury, harm or complaints.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; - All unattended open excavations must be adequately fenced or demarcated; - Ensure warning signs are erected on the perimeter of these areas in the local language/s. - Structural safety to be ensured according to engineering standards. - Adequate protective measures must be implemented to prevent unauthorised access to the Works area; - Ensure structures vulnerable to high winds are secured; and - Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged. 	Community Liaison Officer (CLO)	Appointment of CLO and implementation of the complaints register process	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials

ASPECT: SANITATION - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Clean and well-maintained toilet facilities are available to all staff to minimise the risk of disease and impact on the environment.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Minimum 1 toilet per 15 users. Provision should be made for male and female toilets. - Only portable chemical toilets with a sealed reservoir will be allowed on site. - The capacity of the reservoirs in the portable chemical toilets must be monitored daily to ensure that they can be serviced timeously. - The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for ablutions must be permitted under any circumstances; - Toilets must not be located within the 1:100yr flood line of a watercourse or the recommended buffer of any wetlands. - Toilets must be secured to the ground to prevent them from toppling due to wind or any other cause. - Spillage should be prevented when the toilets are cleaned or emptied. - Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out. 	DPM Contractor ECO	Demarcation of SCC, sensitive habitats prior to construction Certificates of safe disposal for general, hazardous and recycled waste Record spills/ discharges and environmental incidents	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials Certificates of safe disposal for general, hazardous and recycled waste Environmental incident register

ASPECT: SANITATION - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Clean and well-maintained toilet facilities are available to all staff to minimise the risk of disease and impact on the environment.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Toilets must be emptied before long weekends and workers holidays and must be locked after working hours. - Toilets must be serviced weekly, and the ECO must inspect toilets to ensure compliance with health standards. - Waste must be disposed of at a suitably licensed facility. - A copy of the waste disposal certificates must be maintained. 						

ASPECT: PREVENTION OF DISEASE - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	All necessary precautions linked to the spread of disease are taken.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Ensure that sanitation and social distancing protocols related to COVID-19 are implemented as per the Gazette on Consolidated Coronavirus COVID-19 Direction on Occupational Health and Safety Measures in Workplaces (Gazette 43400 of 4 June 2020); - Undertake environmentally-friendly pest control in the camp area; - Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV/ acquired immunodeficiency syndrome (AIDS); - The Contractor must ensure that information posters on Coronavirus COVID-19 and AIDS are displayed in the Contractor Camp area; - Information and education relating to Coronavirus COVID-19 and sexually transmitted diseases to be made available to both construction workers and the local community, where applicable; - Appropriate Personal Protective Equipment (PPE) to be provided to all staff on site; - Free condoms must be made available to all staff on site at central points; 	DPM Contractor ECO	Awareness raising and posters Access to appropriate PPE	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Number of staff reporting as sick/ number of sick leave days Complaints register Training register Training materials

ASPECT: PREVENTION OF DISEASE - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	All necessary precautions linked to the spread of disease are taken.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Medical support must be made available as appropriate; and - Provide access to Voluntary HIV Testing and Counselling Services. 						

ASPECT: EMERGENCY PROCEDURES - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; - The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; - All staff must be made aware of emergency procedures as part of environmental awareness training; - The relevant local authority must be made aware of a fire as soon as it starts; and - In the event of an emergency, necessary mitigation measures to contain the spill or leak must be implemented. 	DPM Contractor ECO	<p>Compile ERAP prior to the commencement of construction</p> <p>Demarcation of SCC, sensitive habitats prior to construction</p> <p>Certificates of safe disposal for general, hazardous and recycled waste</p> <p>Record spills/ discharges and environmental incidents</p>	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	<p>Complaints register</p> <p>Training register</p> <p>Training materials</p> <p>ERAP</p> <p>Environmental incident register</p>

ASPECT: HAZARDOUS SUBSTANCES - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Safe storage, handling, use and disposal of hazardous substances.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - No refuelling, servicing or chemical storage should occur within 50m of any watercourse. - The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; - All hazardous substances must be stored in suitable containers as defined in the Method Statement (to be compiled once detailed designs have been completed - a generic format is supplied as Appendix B); - Containers must be marked to indicate contents, quantities and safety requirements; - All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill/leak from the stored containers; - Bunded areas to be suitably lined with a South African Bureau of Standards (SABS) approved liner; - An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date continuously; - All hazardous chemicals that will be used on site must have product-specific Material Safety Data Sheets (MSDS); 	DPM Contractor ECO	<p>Compile ERAP prior to the commencement of construction</p> <p>Compile HCS control sheet</p> <p>MSDS</p> <p>Demarcation of SCC, sensitive habitats prior to construction</p> <p>Certificates of safe disposal for general, hazardous and recycled waste</p> <p>Record spills/ discharges and environmental incidents</p>	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	<p>Complaints register</p> <p>Training register</p> <p>Training materials</p> <p>ERAP</p> <p>HCS control sheet and updates</p> <p>MSDS</p> <p>Spill kits available on site</p> <p>Environmental incident register</p>

ASPECT: HAZARDOUS SUBSTANCES - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Safe storage, handling, use and disposal of hazardous substances.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; - Employees handling hazardous substances /materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; - The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or bowsers; - The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/bowsers (110% statutory requirement plus an allowance for rainfall); - The floor of the bund must be sloped, draining to an oil separator; - Provision must be made for refuelling at the storage area by protecting the soil with an impermeable ground cover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; 						

ASPECT: HAZARDOUS SUBSTANCES - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Safe storage, handling, use and disposal of hazardous substances.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - All empty externally dirty drums must be stored with a lid on a drip tray or within a bunded area; - No unauthorised access into the hazardous substances' storage areas must be permitted; - No smoking must be allowed within the vicinity of the hazardous storage areas; - Adequate fire-fighting equipment must be made available at all hazardous storage areas; - Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used; - An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substances must be available at all times; - The responsible operator must have the required training to make use of the spill kit in emergencies; - An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; - In the event of a spill, contaminated soil must be collected in containers and stored 						

ASPECT: HAZARDOUS SUBSTANCES - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Safe storage, handling, use and disposal of hazardous substances.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
in a central location and disposed of according to the NEM: WA.						

ASPECT: WORKSHOP, EQUIPMENT MAINTENANCE AND STORAGE - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Soil, surface water and groundwater contamination are minimised.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Where possible and practical all maintenance of vehicles and equipment must take place in designated workshop area/s; - During servicing of vehicles or equipment, in emergency situations outside the designated workshop area/s, a suitable drip tray must be used to prevent spills onto the soil; - Drip trays are mandatory under all heavy construction vehicles when they are 	DPM Contractor ECO	Compile ERAP prior to the commencement of construction Compile HCS control sheet MSDS	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials ERAP

ASPECT: WORKSHOP, EQUIPMENT MAINTENANCE AND STORAGE - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Soil, surface water and groundwater contamination are minimised.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
parked and not in operation and should be regularly inspected. - Leaking equipment must be repaired immediately or be removed from the site to facilitate repair; - Workshop areas must be monitored for oil and fuel spills; - Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; - The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil-water separator where maintenance work on vehicles and equipment can be performed; - Water drainage from the workshop must be contained and managed.		Certificates of safe disposal for general, hazardous and recycled waste Record spills/ discharges and environmental incidents				HCS control sheet and updates MSDS Spill kits available on site Environmental incident register

ASPECT: BATCHING PLANTS - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASES						
Impact management outcome	Minimise spillages and contamination of soil, surface water and groundwater.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Concrete mixing must be carried out on an impermeable surface; - Batching plants areas must be fitted with a containment facility for the collection of cement laden water. - Dirty water from the batching plant must be contained to prevent soil and groundwater contamination; - Bagged cement must be stored in an appropriate facility and at least 10 m away from any watercourses, gullies and drains; - A washout facility must be provided for washing concrete associated equipment. Water used for washing must be restricted; - Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriately licenced disposal facility; - Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site and appropriately disposed; - Sand and aggregates containing cement must be kept damp to prevent the generation of dust; - Any excess sand, stone and cement must be removed (or reused) from the site on 	DPM Contractor ECO	Compile ERAP prior to the commencement of construction Compile HCS control sheet MSDS Certificates of safe disposal for general, hazardous and recycled waste Record spills/ discharges and environmental incidents	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials ERAP HCS control sheet and updates MSDS Spill kits available on site Environmental incident register

ASPECT: BATCHING PLANTS - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASES						
Impact management outcome	Minimise spillages and contamination of soil, surface water and groundwater.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
completion of the construction period and disposed at a registered disposal facility; and - Temporary fencing must be erected around batching plants						

ASPECT: DUST EMISSIONS - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Dust prevention measures are applied to minimise the generation of dust.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; - Comply with the National Dust Control Regulations, GN 36974 of 1 November 2013, in terms of the NEM: AQA, as amended, and all applicable local bylaws. - Removal of vegetation must be avoided until soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible; - Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; - During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; - Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; 	DPM Contractor ECO	Compile ERAP prior to the commencement of construction Compile HCS control sheet MSDS Certificates of safe disposal for general, hazardous and recycled waste Record spills/ discharges and environmental incidents	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials ERAP HCS control sheet and updates MSDS Spill kits available on site Certificates of safe disposal for general, hazardous and recycled waste

ASPECT: DUST EMISSIONS - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Dust prevention measures are applied to minimise the generation of dust.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; - Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; - All incoming and outgoing truck loads must be covered; - Avoid dust-generating works during extremely windy conditions; - Apply an appropriate dust suppression protocol to limit the generation of dust through construction activities and traffic on unsealed roads - there may be the need for frequent wetting of the Solar PV access road; and - The use of chemical stabilisation on access road must be considered as its usually cost-effective for relatively long term or semi-permanent unpaved roads; - When working near (within 100 m) a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible; and 						Environmental incident register

ASPECT: DUST EMISSIONS - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Dust prevention measures are applied to minimise the generation of dust.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
- Ensure that all construction vehicles are maintained to the manufacturer's specifications.						

ASPECT: NOISE - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - The Contractor must keep the noise level within acceptable limits. - Comply with the Noise Control Regulations in terms of Section 25 of the ECA (GN R154 of 10 January 1992) and all local noise bylaws. - Restrict the use of sound amplification equipment for communication and emergency only; - All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; - Any complaints received by the Contractor regarding noise must be recorded and communicated to the ECO and DPM. - Develop a Code of Conduct for the construction phase in terms of the behaviour of construction staff. - Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management. 	DPM Contractor ECO	Employee Code of Conduct Control of working hours	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials Environmental incident register

ASPECT: FIRE PREVENTION - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Prevention of uncontrollable fires.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Ensure compliance with the National Veld and Forest Fire Act (101 of 1998); - A fire break will be maintained between the plant fence and the perimeter fence; - Designate smoking areas where the fire hazard could be regarded as insignificant; - Smoking must be controlled as per the Tobacco Products Control Act, 1993 (Act No. 83 of 1993), as amended. - No open fires will be allowed on site. - Firefighting equipment must be available on all vehicles located on site; - The local Fire Protection Agency (FPA) must be informed of construction activities; - Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; - Two-way swop of contact details between ECO and dEO/cEO and FPA. 	DPM Contractor ECO	Emergency contact details on site	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials Emergency contact details on site Environmental incident register

ASPECT: STOCKPILING AND STOCKPILE AREAS - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Reduce erosion and sedimentation as a result of stockpiling.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - The designated work servitude area and development footprint is to be cleared-topsoil is to be removed and stockpiled on the opposite side of the trench to other backfill material, within the designated working servitude for later reinstatement; - Topsoil stockpiles may not be higher than 2m, must be protected against erosion (e.g., vegetating the topsoil stockpiles/utilising sandbags and/or hessian covers/etc.) and invasion of alien species (regular inspection and removal of invasive/alien vegetation). - The work servitude is to be kept clean at all times from any debris and foreign material; - All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site to minimise impacts to watercourses, watercourses and water bodies; - All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; 	DPM Contractor ECO	Demarcation of SCC, sensitive habitats and watercourses prior to construction Implementation of the approved alien and invasive plant control and eradication plan	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials Emergency contact details on site Environmental incident register

ASPECT: STOCKPILING AND STOCKPILE AREAS - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Reduce erosion and sedimentation as a result of stockpiling.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - If soil stockpiles are to be kept for more than 3 months, they must be hydro seeded. - The slope and height of stockpiles must be limited to 1.5m and are not be sloped more than a ratio of 1:2 to avoid collapse. - During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); - Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material to prevent erosion of the material. 						

ASPECT: CIVIL WORKS - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASES						
Impact management outcome	Impact on the environment minimised during civil works.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Where terracing is required, topsoil must be collected and retained for re-use later to rehabilitate disturbed areas not covered by yard stone; - Areas to be rehabilitated include terrace embankments; - Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; - These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; - All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and - Spoil can, however, be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes. 	DPM Contractor ECO	<p>Demarcation of SCC, sensitive habitats and watercourses prior to construction</p> <p>Implementation of the approved alien and invasive plant control and eradication plan</p>	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	<p>Complaints register</p> <p>Training register</p> <p>Training materials</p> <p>Certificates of safe disposal for general, hazardous and recycled waste</p> <p>Environmental incident register</p>

ASPECT: SOCIO-ECONOMIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Enhanced socio-economic development.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Ensure that construction workers are identifiable. All workers should carry identification cards and wear identifiable clothing; - Fence off the construction site and control access to these sites; - Appoint an independent security company to monitor the site; - Encourage local people to report any suspicious activity associated with the construction sites through the establishment of a community liaison forum; - Prevent loitering within the vicinity of the construction camp as well as construction sites. - Develop and implement communication strategies to facilitate community liaison; - Communicate the limitation of opportunities created by the project through Community Leaders and Ward Councillors; - Apply the existing Procurement Policy as drawn up in consultation with 	CLO	<p>Recording complaints/ grievances in the complaints register</p> <p>Maintain records of correspondence with Interested and Affected Parties</p>	All phases (ongoing)	ECO cEO dEO CLO	All phases (ongoing)	<p>Complaints register</p> <p>Training register</p> <p>Training materials</p> <p>HIV Infections Policy</p> <p>Procurement Policy</p>

ASPECT: SOCIO-ECONOMIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Enhanced socio-economic development.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
community leaders and Ward Councillors for the area; - Wherever feasible, residents should be recruited to fill semi and unskilled jobs; - Women should be given equal employment opportunities and encouraged to apply for positions; - A skills transfer plan should be put in place at an early stage and workers should be allowed to develop skills that they can use to secure jobs elsewhere post-construction; - A procurement policy promoting the use of local business should, where possible, be put in place to be applied throughout the construction phase; - Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; - Sustain continuous communication and liaison with neighbouring owners and residents; - Create work and training opportunities for local stakeholders (as appropriate);						

ASPECT: SOCIO-ECONOMIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Enhanced socio-economic development.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Ensure that an onsite HIV Infections Policy is in place and that construction workers have easy access to condoms; - Expose workers to a health and HIV/AIDS awareness educational programme; - Extend the HIV/AIDS program into the community with a specific focus on schools and youth clubs. - Ensure all construction equipment and vehicles are properly maintained at all times; - Ensure that operators and drivers are properly trained and make them aware, through regular toolbox talks, of any risk they may pose to the community. Place specific emphasis on the vulnerable sector of the population such as children and the elderly; - Ensure that fires lit by construction staff are only ignited in designated areas and that the appropriate safety precautions, such as not lighting fires in strong winds and completely extinguishing fires before leaving them unattended, are strictly adhered to; 						

ASPECT: SOCIO-ECONOMIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Enhanced socio-economic development.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Make staff aware of the dangers of fire during regular toolbox talks; - Ensure that, at all times, people have access to their properties as well as to social facilities; - Regularly monitor the effect that construction is having on infrastructure and immediately report any damage to infrastructure to the appropriate authority; - Ensure that where communities' access is obstructed that this access is restored to an acceptable state; - Communicate the benefits associated with renewable energy to the broader community; - Ensure that all affected landowners and tourist associations are regularly consulted; - A Grievance Mechanism should be put in place and all grievances should be dealt with transparently; - Implement a training and skills development programme for local employees/work seekers; - Work closely with the appropriate municipal structures regarding 						

ASPECT: SOCIO-ECONOMIC - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Enhanced socio-economic development.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
establishing a social responsibility programme. - Ensure that the procurement policy supports local enterprises; - Establish and implement a social responsibility programme aligned with the Engineering, Procurement and Construction (EPC) and Operational and Management (O&M) Strategies; - Work closely with the appropriate municipal structures regarding establishing a social responsibility programme; and - Ensure that any trusts or funds are strictly managed in respect of outcomes and funds.						

ASPECT: TEMPORARY CLOSURE OF SITE - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASES						
Impact management outcome	Minimise the risk of environmental impact during periods of site closure greater than five days.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in Hazardous substances and Workshop, equipment maintenance and storage; - General waste bins are to be emptied and waste removed from site. - Hazardous storage areas must be well ventilated; - Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; - Emergency and contact details displayed must be displayed; - Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; - Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; - Fire hazards identified, and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; 	DPM Contractor ECO	Implementation of SWMP Certificates of safe disposal for general, hazardous and recycled waste Record spills/ discharges and environmental incidents Compile ERAP prior to the commencement of construction Compile HCS control sheet MSDS	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials Environmental incident register SWMP ERAP HCS control sheet MSDS

ASPECT: TEMPORARY CLOSURE OF SITE - PRE-CONSTRUCTION PLANNING AND DESIGN AND CONSTRUCTION PHASES						
Impact management outcome	Minimise the risk of environmental impact during periods of site closure greater than five days.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Structures vulnerable to high winds must be secured; - Wind and dust mitigation must be implemented; - Cement and materials stores must have been secured; - Toilets must have been emptied and secured; - Refuse bins must have been emptied and secured; - Drip trays must have been emptied and secured. 						

ASPECT: VISUAL IMPACTS AND LIGHTING - PRE-CONSTRUCTION PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Minimise the visual impact					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Ensure that the PV Panels, transmission lines, transmission line corridors and substations are maintained and in a visually acceptable state at all times; - Use suitable building finishes/colours that blend in with the surrounding landscape; - Set up visual screens (such as trees, shrubs or hedges) along the perimeter of the study area; - Choose suitable types of lighting that minimize glare and sky glow; - Only focus light sources on where it is needed; - Consult a qualified lighting engineer or lighting specialist; - No spotlights should be used; - Mounting light fixtures should be avoided; and - Utilize motion sensor lights at security buildings. 	DPM Contractor ECO		All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials Environmental incident register

ASPECT: POST-CONSTRUCTION LANDSCAPING AND REHABILITATION - OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - A Rehabilitation Plan/ Strategy must be compiled and implemented. - Proper planning for rehabilitation is considered critical for ensuring that rehabilitation is successful. - Removal of all foreign debris, waste, cement/concrete, building materials and similar from the watercourse and dispose of properly at a suitable landfill site. - Any active erosion features (e.g. dongas) need to be fixed/stabilised. - Alien plants, particularly those considered invasive in terms of the NEM: BA will need to be removed/eradicated. - Where sod replanting is unsuccessful or where there is an insufficient quantity of sods (i.e. already cleared areas), plants will need to be translocated from a similar vegetation type. Where a rapid cover is required in the drier areas, the bare areas should be seeded with a suitable indigenous seed mix (<i>Aristida junciformis</i>, for example) in addition to translocation planting where possible. This will need to be 	DPM Contractor ECO	Rehabilitation Plan/ Strategy Quantum Cost Calculation for Rehabilitation	All phases (ongoing)	ECO cEO dEO	All phases (ongoing)	Complaints register Training register Training materials Environmental incident register

ASPECT: POST-CONSTRUCTION LANDSCAPING AND REHABILITATION - OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<p>done under the instruction and guidance of a plant ecologist, botanist or horticulturalist.</p> <ul style="list-style-type: none"> - It is recommended that landscaping promote the use of indigenous species common to the region and that as much natural ground cover is established (naturally) on the site to help with binding soils and encouraging water infiltration, thus reducing overland flows and the pressure on stormwater management infrastructure. Species such as <i>Ficus natalensis</i> / <i>Ficus sur</i> (Fig trees) and <i>Acacia xanthophloea</i> (Fever tree) are not recommended as their extensive rooting systems can damage road and subsurface drainage infrastructure. - The re-vegetation should be timed to occur before the wet season (November-January) so that watering requirement is minimized, and plant growth is most vigorous. - Watering should be gentle so that rill erosion is avoided and minimised. - Any erosion damage resulting from watering/irrigation must be repaired immediately. 						

ASPECT: POST-CONSTRUCTION LANDSCAPING AND REHABILITATION - OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Once the sods are planted, the planting contractor will need to conduct weekly site visits to remove alien plants (in accordance with the latest revised NEM: BA requirements) and address any re-vegetation concerns until re-vegetation is considered successful (i.e. >90% indigenous cover). - Aftercare, maintenance, monitoring and evaluation of rehabilitation and re-vegetation efforts must be undertaken during and after rehabilitation has been completed. The monitoring and evaluation of rehabilitation activities and outcomes are critical in assessing the extent to which the rehabilitation plan has achieved what it set out to accomplish. Thereafter, the rehabilitation must be signed off by the ECO. - All areas disturbed by construction activities must be subject to landscaping and rehabilitation; - All spoil and waste must be disposed of to a registered waste site; - All slopes must be assessed for contouring, and to contour only when 						

ASPECT: POST-CONSTRUCTION LANDSCAPING AND REHABILITATION - OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
the need is identified in accordance with the CARA; - All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with CARA; - Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; - Where new access roads or tracks have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; - Rehabilitation of access roads outside of farmland; - Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; - Stockpiled topsoil must be used for rehabilitation (refer to Stockpiling and stockpiled areas); - Stockpiled topsoil must be evenly spread to facilitate seeding and minimise loss of soil due to erosion;						

ASPECT: POST-CONSTRUCTION LANDSCAPING AND REHABILITATION - OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
<ul style="list-style-type: none"> - Before placing topsoil, all visible weeds from the placement area and the topsoil must be removed; - Subsoil must be ripped before topsoil is placed; - The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; - Where impacted through construction-related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; - Sloped areas are stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. - The contract design specifications must be adhered to and implemented strictly; - Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. - Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below: 						

ASPECT: POST-CONSTRUCTION LANDSCAPING AND REHABILITATION - OPERATIONAL AND CLOSURE/ DECOMMISSIONING PHASES						
Impact management outcome	Areas disturbed during the development phase are returned to a state that approximates the original condition.					
Impact Management Actions	Implementation			Monitoring		
	Responsible Person	Method of Implementation	Timeframe for Implementation	Responsible Person	Frequency	Evidence of Compliance
A mixture of seeds can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; and e) The final product must not cause an ecological imbalance in the area						

6 DECLARATION

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 days prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA

Date

NOTE:

Should the EA be transferred to a new holder, this declaration must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of the EMPr not be submitted. Once approved, the EMPr becomes legally binding to the new EA holder.

APPENDIX A

Curriculum Vitae of Environmental Assessment Practitioner (EAP)



Durban Environmental Unit Head

CORE SKILLS

- Project Management
- Technical & Impact Assessment Guidance
- Environmental Assessment
- Water Use Licencing
- Waste Management Licencing
- Environmental & Waste Auditing and Compliance Monitoring

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DETAILS

Qualifications

- B.Sc. Microbiology (Honours) University of Pretoria 1996
- B.Sc. Biological Sciences University of Pretoria 1994

Memberships

- International Association for Impact Assessors of South Africa (IAIA)
- Institute of Waste Management of South Africa (IWMSA)
- SACNASP (No.117348) (South African Council for Natural Scientific Professionals)

Languages

- Afrikaans
- English

Countries worked in:

South Africa, Zambia, Namibia

PROFILE

Gerda has over 22 years' experience within the environmental and waste management field and strives to deliver custom environmental services to clients.

Gerda began her career in the environmental field within the government sector, managing environmental aspects and impacts as well as reviewing environmental assessments with the view of authorizing or declining authorization of the developments.

After six years within the government sector she joined a consulting engineering firm where she was ultimately responsible for the Management of the Environmental Sub-Division. Gerda has experience in project and client management, financial management and the compilation and costing of project proposals and tenders. She has been involved in several engineering projects as the Environmental Assessment Practitioner as well as the Environmental Control Officer during construction working closely with the Occupational Health and Safety Officer. Gerda has also been involved in projects where waste licensing as well as water use licensing processes formed an integral part of the services offered. Environmental auditing and compliance monitoring of waste disposal sites also forms part of her experience gained. She also has experience in dealing with projects which involve NEC3 Contracts.

Gerda has specialist skills in the following areas:

- Project proposals, planning, costing and timing
- Project and Client Management
- Authority Liaison
- Basic Assessments & Scoping/EIA Processes
- Compilation
- Amendment of EA's & EMP's
- Facilitation of Public Participation Processes & stakeholder engagement
- IWULA & IWWMP Applications
- Environmental Control Officer (ECO) duties
- Environmental Compliance Auditing (IFC Performance Standards & Equator Principles)
- Mentorship & Guidance



Work Experience

Period	Employer	Position	Role/ Responsibility
2019 to Current	GCS Water and Environment (Pty) Ltd	Environmental Unit Manager	Management of the environmental unit in the Durban Office. Management of applications for rectification in terms of Section 24G of the EIA Regulations, undertaking basic environmental assessment and full scoping&eir applications in terms of the Regulations. Management of Integrated Water Use License Applications in terms of the NWA. Undertaking of environmental compliance audits for various construction projects as well as environmental legal audit reviews and environmental due diligence investigations.
2018 to 2019	Terramanzi Group (Pty) Ltd	Senior Environmental Consultant	Management of the environmental unit within the Terramanzi Group. Management of applications for rectification in terms of Section 24G of the EIA Regulations, undertaking basic environmental assessment and full scoping&eir applications in terms of the Regulations. Undertaking of environmental compliance audits for various construction projects as well as environmental legal audit reviews and environmental due diligence investigations.
2014 to 2017	GIBB (Pty) Ltd	Senior Environmental Scientist	Management of applications for rectification in terms of Section 24G of the EIA Regulations, undertaking of basic environmental assessment and full scoping&eir applications in terms of the Regulations. Management of Integrated Water Use License Applications in terms of the NWA. Undertaking of environmental compliance audits for various construction projects as well as environmental legal audit reviews and environmental due diligence investigations.
2011 to 2013	WorleyParsons RSA	Senior Environmental Scientist & Durban Department Head Environment	Management of the environmental unit in the Durban Office. Management of applications for rectification in terms of Section 24G of the EIA Regulations, undertaking of basic environmental assessment and full scoping&eir applications in terms of the Regulations. Management of Integrated Water Use License Applications in terms of the NWA. Undertaking of environmental compliance audits for various construction projects as well as environmental legal audit reviews and environmental due diligence investigations.
2003 to 2011	KV3 Engineers	Senior Environmental Scientist	Management of applications for exemption from compliance with the EIA Regulations, undertaking of basic environmental assessment applications, as well as full environmental impact assessment applications.
2000 to 2003	Gauteng Department of Agriculture, Conservation & Environment	Assistant Director: Waste Management Division	Project management and environmental management pertaining to all developments within a designated area in Gauteng Province. Review of EIAs, formulation of comments and or authorisations within designated area in Gauteng Province. Liaison with waste contractors, industries and others. Management of legal interventions required in terms of environmental legislation within a designated area. Supporting environmental officers at all levels in terms of technical and environmental guidance, input into strategic decisions, resolving complex and potentially challenging issues.
1999 to 2000	Gauteng Department of Agriculture, Conservation & Environment	Senior Environmental Officer: Waste Management Division	
1997 to 1999	Gauteng Department of Agriculture, Conservation & Environment	Environmental Officer: Waste Management Division	
1996	Spartan Private School	Teacher: Natural Science & Biology	Teacher in Biology and Natural Science for Grades 7 to 12.



Project Experience

Year	Client	Project Description	Role/ Responsibility
Strategic and Environmental Guidance Projects			
1999 to 2003	Gauteng Department of Agriculture, Conservation & Environment	Development of a Health Care Risk Waste Management Strategy for Gauteng.	Part of Development Team
2001 to 2003	Gauteng Department of Agriculture, Conservation & Environment	Development of Minimum Domestic Waste Collection Standards for Gauteng Province.	Part of Development Team
2002	Gauteng Department of Agriculture, Conservation & Environment	Development of new EIA guidelines and regulations for the Gauteng Province.	Part of Development Team
2005	Gauteng Department of Agriculture, Conservation & Environment	GDACE Green Procurement Project: Development of the GDACE Green Procurement Policy, Gauteng	Project Manager & Reviewer
2008	GAUTRAIN Project Engineers (i.e. KV3 Engineers)	Environmental Assistance for the Gautrain Project: Environmental Evaluation of various documentation and engineering designs in terms of their environmental compliance.	Project Manager & Reviewer
2009	Department of Environmental Affairs	Alignment of MIG Project Process with EIA Process: Evaluation of the EIA process as well as the MIG process in order to produce a process alignment guideline to the municipalities to streamline the two processes.	Part of Development Team
Environmental Feasibility and Screening			
2008	Nu Way-property Developments	Management of Environmental Screening and Due Diligence Assessment for several proposed Nu Way-property Developments, Gauteng.	Project Manager
2008	Department of Water Affairs	Mokolo Croc WAP Environmental Feasibility and Screening, Limpopo.	Project Manager & Senior Environmental Assessment Practitioner (EAP)
2016	Kwadukuza Municipality	Environmental Feasibility for Civil Engineering Project Foxhill Road Alignment and Construction, Tongaat, Kwa-Zulu-Natal.	Environmental Project Leader
2016	King Sabata Dalindyebo Local Municipality (C/O OR Tambo District Municipality)	Environmental Screening Investigation of six proposed development corridors for the Mthatha Bulk Water Infrastructure Presidential Intervention - Phase 2: Secondary Bulk Infrastructure project.	Environmental Project Leader
2019 - 2020	Phumaf Holdings (Pty) Ltd	Environmental Screening for various sites within Ekurhuleni Municipality as part of the Gauteng Rapid Land Release Programme (GRLRP) project for the Provincial Department of Human Settlements	Project Manager & Senior EAP



Project Experience

Year	Client	Project Description	Role/ Responsibility
Development Environmental Assessments			
2003 to 2005	ABSA DevCO	Environmental Impact Assessment for a change of land-use from agricultural to Residential and Town Development of the farm Brakfontein 399 JR, Centurion, Gauteng.	Project Manager & Senior EAP
2005 to 2010	Air Traffic Navigation Services (ATNS)	The project entails the upgrading of existing, and the provision of new air navigation sites (27 in total) throughout South Africa. Civil and electrical infrastructure to the sites needed to be upgraded to accommodate the equipment. Various Environmental Impact Assessments for various individual projects in various provinces within South Africa.	Project Manager & Senior EAP
2006 to 2009	Amathole District Municipality	Elliotdale Rural Sustainable Human Settlement Pilot Project Environmental Impact Assessment. Responsible for the environmental assessment process which was based on a strategic approach for the Elliotdale Rural Housing Project, Elliotdale, Eastern Cape.	Project Manager & Senior EAP
2007	Elkem Ferroveld	Environmental Basic Assessment for the upgrading and expansion of the Ferroveld Plant in Ferrometals, Emahlaheni, Mpumalanga.	Project Manager & Senior EAP
2008	ABSA DevCO	Environmental Impact Assessment for a change in land use from agricultural to Residential and Town development of Montana X40, Pretoria, Gauteng.	Project Manager & Senior EAP
2012	Transnet Capital Projects	Environmental Basic Assessment and technical environmental investigations for the proposed expansion of the existing tug jetty and construction of a new tug jetty for Transnet Capital Projects in the Port of Durban, KwaZulu-Natal.	Project Manager & Senior EAP
2014 to 2016	Dube TradePort	Environmental Impact Assessment for the proposed construction of the Dube TradePort TradeZone 2 in La Mercy, KwaZulu-Natal.	Project Manager & Senior EAP
2014 to 2017	Dube TradePort	Environmental Impact Assessment for the proposed Support Precinct 2 Development in La Mercy, KwaZulu-Natal.	Project Manager & Senior EAP
2016 to 2017	Areena Resort	Application for rectification in terms of S24G and associated Environmental Basic Assessment for the alleged unlawful construction activities at the Areena Resort, Great Kei Municipality, Eastern Cape.	Project Manager & Senior EAP
2016 to 2017	Areena Resort	Application for rectification in terms of S24G and associated Environmental Basic Assessment for the alleged unlawful construction activities on Hillsdrift Farm, Great Kei Municipality, Eastern Cape.	Project Manager & Senior EAP
2018 to 2019	Watchman Properties (Pty) Ltd	Environmental Basic Assessment for the proposed Vendome Residential Development on Portion 1 of Farm 1766 and Portion 2 of Farm 1766, Paarl, Western Cape, South Africa.	Project Manager & Senior EAP
2018 to 2019	Keysha Investments 213 (Pty) Ltd	Environmental Basic Assessment for the proposed River Farm Estate Development and associated infrastructure on remainder of farm Rivierplaas No. 1486, Erf 111 and Erf 197, Paarl, Western Cape, South Africa.	Project Manager & Senior EAP
2018 to 2019	Paarl Vallei Developments (Pty) Ltd	Environmental Basic Assessment for the proposed Paarl Vallei Retirement Village Development, Paarl, Western Cape, South Africa.	Project Manager & Senior EAP



Project Experience

Year	Client	Project Description	Role/ Responsibility
2018 to 2019	Val de Vie Investments (Pty) Ltd	Parallel Substantive Amendment Application process for the authorised Pearl Valley II & Levendal Residential Developments, Paarl, Western Cape, South Africa.	Project Manager & Senior EAP
2019 - 2021	Phumaf Holdings (Pty) Ltd	Environmental Services for: <ul style="list-style-type: none"> • Full Environmental Impact Assessment for the proposed Unitas Park Ext 16 Mixed Use Development; • Basic Environmental Impact Assessment for the proposed Evaton West F Mixed Use Development; and • Basic Environmental Impact Assessment for the proposed Evaton West I Mixed Use Development. 	Project Manager & Senior EAP
Renewable Energy Environmental Assessments			
2011	Farmsecure Carbon	Environmental Basic Assessment and Water Use License Application process for a proposed Biogas Waste to Energy project for a pig farm, Mooiriver, KwaZulu-Natal.	Project Manager & Senior EAP
2018 to 2019	GIPID - Doornfontein Solar Farm (Pty) Ltd	Environmental Impact Assessment for the proposed 230 MW Doornfontein Photovoltaic Solar Energy Facility (PVSEF) located on Remainder of Farm 118, Doornfontein, Piketberg, Bergrivier Local Municipality, Western Cape.	Project Manager & Senior EAP
2018 to 2019	GIPID - Kruispad Solar Farm (Pty) Ltd	Environmental Impact Assessment for the proposed 150 MW Kruispad Photovoltaic Solar Energy Facility (PVSEF) located on Remainder of Farm 120, Kruispad, Piketberg, Bergrivier Local Municipality, Western Cape.	Project Manager & Senior EAP
2018 to 2019	Brandvalley Wind Farm (Pty) Ltd	Substantive Amendment Application for the authorised 140 MW Brandvalley Wind Energy Facility (WEF) located within the Karoo Hoogland, Witzenberg and Laingsburg Local Municipalities in the Northern and Western Cape Provinces.	Project Manager & Senior EAP
2018 to 2019	Copperton Wind Farm (Pty) Ltd	Non-Substantive Amendment Application to update the information of the Holder of the Environmental Authorisation & an EMPr Amendment Process to update the Airstrip Alignment and to provide an updated "outcomes based" EMPr for the Copperton Wind Energy Facility near Copperton in the Northern Cape.	Project Manager & Senior EAP
2018 to 2019	WKN Windcurrent SA (Pty) Ltd	Environmental Impact Assessment for the proposed 150 MW Haga Haga Wind Energy Facility (WEF) & Environmental Basic Assessment for the associated Haga Haga Overhead Powerline (OHPL) in Haga Haga, Great Kei Local Municipality, Eastern Cape.	Project Manager & Senior EAP
Mining Environmental Assessments			
2007	Chris Hani Municipality	Environmental Assessment and DME Licence Application on behalf of Chris Hani Municipality. Responsible for exemption application from Mining Permit and Environmental Management Programmes for 17 borrow pits in Middelburg, Eastern Cape.	Project Manager & Senior EAP
2010	Samancor Chrome Limited	The Lwala Greenfields Mine and Smelter EIA and EMP. Responsible for the Environmental	Project Manager & Senior



Project Experience

Year	Client	Project Description	Role/ Responsibility
		impact assessment and technical investigations for the waste management issues for the proposed development of a new chrome smelter project in the Steelpoort area, Limpopo.	EAP
2011	Xtrata Alloys	Xtrata Alloys Western Mines PSV application for authorization in terms of the MPRDA. Responsible for the undertaking of the EIA and compilation of the amended EMPr and technical environmental investigations for the proposed development of an open cast mine in Rustenburg, North West.	Project Manager & Senior EAP
2019 - 2021	Zululand Anthracite Colliery	Environmental Basic Assessment for the proposed New Mngeni Adit & Associated Infrastructure, Mandlakazi Traditional Authority, KwaZulu-Natal.	Project Manager & Senior EAP
2019 - 2021	Harmony Gold	Environmental Assessment process to obtain environmental authorisation for the proposed expansion of the existing Kareerand Tailings Storage Facility, Dr Kenneth Kaunda District Municipality, North-West Province.	Project Manager & Senior EAP
Waste Management Environmental Assessments			
2003	Assmang Chrome Machadodorp	Environmental Impact Assessment for the permitting of the H:H Hazardous Waste Disposal Facility at Assmang Chrome, Machadodorp.	Senior EAP
2004	Emfuleni Local Municipality	Environmental Impact Assessment for the closure of the Zuurfontein Landfill site for the Emfuleni Local Municipality, Sedibeng, Gauteng	Senior EAP
2004	Ekurhuleni Municipality	Environmental Impact Assessment for the closure of the Sebenza Landfill Site for the Ekurhuleni Municipality, Gauteng.	Senior EAP
2004	Tzaneen Local Municipality	Application for authorisation and EIA for the permitting of an existing solid waste disposal site for the Tzaneen Local Municipality, Mpumalanga.	Senior EAP
2006	Samancor Chrome Middelburg	Environmental Basic Assessment for the permitting of the existing Slag Waste Disposal facility for Samancor Chrome Middelburg, Mpumalanga.	Senior EAP
2006	Samancor Chrome Ferrometals	Environmental Basic Assessment for the permitting of the existing Slag Waste Disposal facility for Samancor Chrome Ferrometals Witbank, Mpumalanga.	Senior EAP
2007	Steve Tshwete Municipality	Environmental Impact Assessments for four Solid waste Transfer Stations for the Steve Tshwete Municipality, Mpumalanga.	Senior EAP
2008	Assmang Chrome Machadodorp	Environmental Impact Assessment for the expansion of the existing Slag Waste Disposal Facility at Assmang Chrome. Responsible for the EIA application for authorization for the proposed expansion project in Machadodorp, Mpumalanga.	Project Manager & Senior EAP:
2010	ArcelorMittal	ArcelorMittal BOF Slag Disposal site licensing of new site and closure of old site, Newcastle, KwaZulu-Natal.	Project Manager & Senior EAP:
2010	Lekwa Municipality	Waste Management License Application for authorization and the conducting of an EIA and technical environmental investigation for the proposed development of two landfill sites for the Lekwa Municipality, Mpumalanga.	Project Manager & Senior EAP:



Project Experience

Year	Client	Project Description	Role/ Responsibility
2015 to 2017	Umgungundlovu Municipality	Advanced Solid Waste Management Project for Umgungundlovu Municipality for proposed Materials Recovery Facilities located in various Local Municipalities, Umgungundlovu Municipality, KwaZulu-Natal.	Project Manager & Senior EAP:
2019 - 2021	Buffalo Coal	Magdalena Colliery Waste Management License Application, Dundee, KwaZulu-Natal.	Project Manager & Senior EAP:
Water and Wastewater Environmental Assessments			
2004	Mskaligwa Municipality	Environmental Impact Assessment for the installation of a water reticulation system at Nganga for the Mskaligwa Municipality, Mpumalanga.	Senior EAP
2006 to 2010	eThekwini Municipality: Water and Sanitation	Proposed upgrading of the WWTW capacity in the Northern Areas of the eThekwini Municipality. Responsible for EIA application for authorization, technical environmental investigations, and waste management license application for the proposed expansion of the WWT capacity in Northern eThekwini, KwaZulu-Natal.	Project Manager & Senior EAP
2008	Johannesburg Water	Environmental Management Services for Johannesburg Water: Environmental Impact Assessment (Exemption) for various individual projects related to the upgrading of the Bryanston Water Mains, Gauteng.	Project Manager & Senior EAP
2014 to 2017	eThekwini Municipality: Water and Sanitation	Environmental Basic Assessment and Water Use License Application for the Northern Aqueduct Water Augmentation Project (Phase 5), Durban, KwaZulu-Natal.	Project Manager & Senior EAP
Electrical and Linear Environmental Assessments			
2005	Magallies Water	Application for (exemption) authorisation on behalf of Magallies Water for the installation of the Rising Main from the Roodeplaat Waterworks to the Wallmannsthal Reservoir, in Wallmannsthal, Gauteng.	Senior EAP
2010	Moloto Rail Corridor Development	EIA for the Moloto Rail Corridor Development. Responsible for the EIA application for authorization and technical environmental investigations for the proposed Moloto Rail Corridor Development, Moloto, Gauteng.	Project Manager & Senior EAP
2010	ESKOM	Environmental Basic Assessment of for the ESKOM Honingklip 88kV & ESKOM Randjiesfontein 88kV overhead line and Sub-Stations, Johannesburg, Gauteng.	Project Manager & Senior EAP
2010	ESKOM	Environmental Basic Assessment of for the ESKOM Ubertas Strategic Servitude Sub-Station, Johannesburg, Gauteng	Project Manager & Senior EAP
2014 to 2017	Msunduzi Municipality	Environmental Impact Assessment for the proposed Msunduzi IRPTN project, Pietermaritzburg, KwaZulu-Natal	Project Manager & Senior EAP
Environmental and Waste Management Compliance Monitoring and Auditing			
2005 to 2009	Sedibeng District Municipality	Auditing of Zuurfontein and Boitshepi Landfill sites for the Sedibeng District Municipality, Gauteng.	Part of Audit Team



Project Experience

Year	Client	Project Description	Role/ Responsibility
2006 to 2009	ABSA DevCO	Environmental Compliance monitoring in accordance with relevant authorisation conditions and environmental management plans for the Amberfield Development on the farm Brakfontein 399 JR, Centurion, Gauteng.	Project Manager & Environmental Control Officer (ECO)
2007 to 2009	ABSA DevCO	Environmental Compliance monitoring in accordance with relevant authorisation conditions and environmental management plans for the Zambezi Estate Development, Montana, Gauteng.	Project Manager & ECO
2008 to 2009	Steve Tshwete Municipality	Auditing of Middelburg Landfill Site for the Steve Tshwete Municipality, Mpumalanga.	Part of Audit Team
2008 to 2009	ABSA DevCO	Environmental Compliance monitoring in accordance with relevant authorisation conditions and environmental management plans for the Cedar Creek Development, Fourways, Gauteng.	Project Manager & ECO
2017 to 2018	Dube TradePort	Environmental Compliance monitoring in accordance with relevant authorisation conditions and environmental management plans for the construction of TradeZone 2, Dube TradePort, La Mercy, KwaZulu-Natal.	Project Manager & ECO
2017	Richards Bay Minerals	Environmental Legal Compliance Audit to determine the level of compliance of Richards Bay Minerals' to their various mining, water and waste licenses and environmental authorisations and permits, Richards Bay, KwaZulu-Natal.	Project Manager & Environmental Auditor
2017 to 2018	eThekwini Municipality	Environmental Compliance monitoring in accordance with relevant authorisation conditions and environmental management plans for the construction of the Northern Aqueduct Phase 5, Durban, KwaZulu-Natal.	Project Manager & ECO
2019	Buffalo Coal	Annual EMPr and WUL audits for Coalfields, Avimore and Magdalena Operations, Dundee, KwaZulu-Natal.	Project Manager & Lead Auditor
2020	Buffalo Coal	Annual EMPr and WUL audits for Coalfields, Avimore and Magdalena Operations, Dundee, KwaZulu-Natal.	Project Manager & Lead Auditor
2020	Samancor Eastern Chrome Mines	Annual Performance Assessment Audits for the following mines in Limpopo: <ul style="list-style-type: none"> • Doornbosch, Steelpoort and Montrose Mines; • Quartz Mine; • Lwala Mine; • Lannex Mine; • Spitskop Mine; and • Tweefontein Mine. 	Project Manager & Technical Review
2020	ESKOM	ESKOM Biennial PCB Phase-out Compliance Audit, various sites within South Africa.	Project Manager & Lead Auditor
2020	ESKOM	Majuba Power Station Legal Compliance Audit, Volksrust, Mpumalanga.	Project Manager & Lead Auditor



Project Experience


Year	Client	Project Description	Role/ Responsibility
2021	Zululand Anthracite Colliery	Annual IWUL Audit for 2020, Mandlakazi Traditional Authority, KwaZulu-Natal	Project Manager & Technical Review
Integrated Water Use License Applications			
2010	FOSKOR	Integrated Water Use License Application for a new storage dam for FOSKOR, Richards Bay, KwaZulu-Natal.	Part of Project Team
2014 to 2015	SANRAL	Integrated Water Use License Applications as required for the proposed SANRAL N2 Road upgrade from Mthunzini to Empangeni, KwaZulu-Natal.	Project Manager & Senior EAP
2014	eThekweni Municipality: Roads	Integrated Water Use License Application for the proposed Realignment of Inanda Arterial Road, Durban, KwaZulu-Natal.	Project Manager & Senior EAP
2015 to 2017	SMEC (Umzimkulu Municipality)	Integrated Water Use License Application for the proposed Licensing of the existing Umzimkhulu Waste Water Treatment Works, Umzimkhulu, KwaZulu-Natal.	Project Manager & Senior EAP
2014 to 2016	eThekweni Municipality: Roads	Water Use License Application for the proposed eThekweni BRT Route C1A, Durban, KwaZulu-Natal.	Project Manager & Senior EAP
2019-2020	Zululand Anthracite Colliery	Integrated Water Use License Application for the new Mngeni Adit and associated infrastructure, Mandlakazi Traditional Authority, KwaZulu-Natal.	Project Manager & Senior EAP
2019-2021	South32 SA Coal Holdings	Integrated Water Use License Application for the Roy Point Mine, Newcastle, KwaZulu-Natal.	Project Manager & Senior EAP
Management and Master Plans			
2005	Livingstone Municipality	Development of the Livingstone Integrated Development Plan, Zambia.	Part of the Project Team
2008	Steve Tshwete Municipality	Development of an Integrated Waste Management Plan for the Steve Tshwete Municipality, Mpumalanga.	Part of the Project Team
2008	Kungwini Local Municipality	Development of an EMP (Framework) for Kungwini Local Municipality, Mpumalanga.	Part of the Project Team
2010	KZN Department of Public Works - Southern Region	Compilation of an Environmental Management Plan for the Fort Napier sewage upgrading project, Pietermaritzburg, Kwa-Zulu Natal.	Project Manager & Senior EAP



Declaration

DECLARATION

I, Gerda Bothma hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and I undertake to inform you of any changes therein, immediately. In case any of the above information is found to be false or untrue or misleading or misrepresenting, I am aware that I may be held liable for it.

Signature:  Date: 18/02/2021

APPENDIX B
Generic Method Statement

Generic Method Statement

Information pertaining to the activity which will be undertaken:

What activity will take place?
How will the activity be undertaken (methods)?
Machinery/plant/equipment or vehicles which will be needed?
Materials required and relevant hazard status?
Where on site will the activity take place and what will the extent of the activity be?
Timeframes of activity (start and end dates)?

Impact and Risk Assessment of the Activity:

Impact sources	
Receptors	
Objective	
Risks	
Notes	

The following signatures represent a binding agreement to the Method Statement and EMPr by all Contractors and Sub-Contractors involved in the above activity.

Role	Name	Company	Date	Signature
Client				
Engineer/Applicant's representative				
Contractor				
ECO				