ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) – POWERLINES CONDITIONS

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Project Title:
The proposed development of a 300MW solar photovoltaic (PV) facility on Portion 1 of Farm Riet Fountain 39C, Portion 1 of Kwanselaars Hoek 40C and Portion 4 of Taaibosch Fontein 41C in the Hanover district, Emthanjeni local municipality, Pixley Ka Seme district municipality; Northern Cape province.

Prepared for:

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Powerline Conditions
Hydrology Specialist Assessment
Pre-Construction phase mitigation measures
Pylons should not be located within an area that would be inundated during a 1:100 flood event.
Construction phase mitigation measures
The area of disturbance should be kept to a minimum to allow clearing of the construction right of way. The width of the construction corridor should be kept to a minimum.
Vegetation should be removed only where essential for the continuation of the powerline. Any disturbance to the adjoining natural vegetation cover or soils should not be allowed.
Vegetation and soil should be retained in position for as long as possible and should only be removed immediately ahead of construction / earthworks in any specific area.
Existing roads should be used for access as far as possible.
The duration of construction activities at each pylon site should be minimised as far as is practical.
Storm water management and erosion control measures should be implemented. These should include the following:
• The excavated soil should be placed on the upstream side of construction activities in order to act as a storm water diversion berm.
• Where such diversion berms create concentrated flows, as well as in steep and/or sensitive areas (such as wetlands) the use of swales, silt fences or other effective erosion control measures is recommended to attenuate runoff.
• All storm water management measures should be regularly maintained.
Drip trays should be placed under any activity requiring active lubrication or oiling at the pylon sites.
Spill clean-up kits should be available on site for immediate remediation of any spills and removal of contaminated soils.
No fuel should be stored at the pylon sites and no refuelling or servicing of construction plant should take place at the construction sites.
No construction materials should be disposed of within the delineated wetlands or within the 100 m buffer zone on the watercourse.
No concrete batching should take place within the delineated wetlands or within the 100 m buffer zone.
All surplus spoil material from the foundation excavations (i.e. not used as backfill) should be removed from the site as soon as is practically possible.

Once construction at a pylon site is complete, the site should be rehabilitated immediately by removing all waste material. The rehabilitation specification should be determined by the soils and vegetation specialists.
All waste material should be removed to a licensed waste disposal facility, if it cannot be re-used or recycled.
In areas where construction activities have been completed and no further disturbance is anticipated, rehabilitation and re-vegetation should commence as soon as possible.
Replanting activities should be undertaken at the end of the dry season (middle to end September) to ensure optimal conditions for germination and rapid vegetation establishment.
Should plants not successfully establish within two growing seasons after the first planting, new plant material should be provided.
A weed and alien invasive species control plan should be implemented during the contract period.
Any erosion channels developing during or after the construction period should be appropriately backfilled (and compacted where relevant) and the areas restored to a condition similar to the condition before the erosion occurred.
A construction method statement should be compiled and approved prior to the commencement of construction activities.
The method statement should take cognisance of:
• The mitigation measures outlined above, as well as mitigation measures specified by each of the environmental specialists.
• The conditions of the Environmental Authorisation and Integrated Water Use Authorisation.
• The Environmental Management Program (EMPr) for the project submitted as part of the Environmental Impact Assessment Report.
The Environmental Control Officer (ECO) must ensure that the contractor adheres to the above-mentioned documents.
Avifauna Assessment
Active monitoring for avifauna mortalities underneath the powerlines must be undertaken.
All powerlines within the project development area, and the loop-in, loop-out powerlines, must have bird flappers installed to reduce collision and electrocution risk.
Operational phase mitigation measures
Existing roads should be used for access as far as possible.
The powerline route should be regularly inspected during the operational phase.
Any erosion channels developing during or after the construction period should be appropriately backfilled (and compacted where relevant) and the areas restored to a condition similar to the condition before the erosion occurred.

The following aspects need to be considered when developing a stormwater management plan:
• During earth disturbance and grading activities, disturbance of the natural topography and vegetation cover should be minimised. The natural contours should be preserved as far as is practical in order to preserve the existing site drainage patterns as far as possible.
• Correct panel level and aspect should be provided in the design of the support structures and not through earthworks.
• Utilisation of low impact construction techniques should be encouraged, with the footprint of disturbed areas being minimised.
The following principles should be applied for storm water management infrastructure, erosion and sediment control:
• Natural, dispersed, drainage should be encouraged, by maintaining the natural drainage characteristics of the land as far as possible, thereby minimising the concentration of flows and consequently the risk of erosion.
• Formal infrastructure, in the form of access roads, pipes, culverts, etc. should be kept to a minimum.
• A storm water drain should be provided along all access roads. The size and lining of the drain would be dependent on the peak flow rates and velocities, which should be determined through hydrological modelling.
• Storm water crossings at access roads should be provided in the form of drifts, rather than pipes or culverts. Drifts should be constructed from concrete or grouted stone pitching. Drifts should be provided at frequent spacings (recommendation is 300 m (Aurecon, 2014), again to minimise the concentration of flows.
All storm water drainage discharge points should be provided with outlet structures, designed with adequate erosion protection, to ensure that storm water is discharged from formal structures onto the natural ground at a safe and acceptable velocity.
A vegetation cover that at least matches the natural, pre-development cover, should be maintained at all times between and beneath the solar panels.
The following is recommended in terms of maintenance and monitoring:
• Regular visual inspections are required to identify problems as they occur.
• Reseed bare areas.
• Repair of erosion channels as soon as they develop.
• Monitoring in the form of visual inspections of the vegetation cover and erosion and sediment control features.
• Any sediment build-up should be removed immediately.
MAINSTREAMING WILDLIFE INCIDENT MANAGEMENT INTO UTILITIES IN SOUTHERN AFRICA - GUIDELINE
Wildlife incidents must be identified, defined, and categorized.

A system must be in place to report and record wildlife incidents in a central incident register (CIR). The system must investigate wildlife interaction incidents, determines the root cause/s of the problem/s, and determine appropriate recommendations to avoid reoccurrence.
Staf have the capacity to identify and report incidents, and the required resources are available to investigate and categorize incidents to the CIR when required.
Staff must be trained to identify and have a basic knowledge of species likely to interact with infrastructure in their region.
Mitigation solutions applicable to the species have been identified, and systems are in place to procure and apply these if required.
Key performance indicators are put in place to ensure that wildlife incidents are closed out quickly and efficiently.
Annual audits are conducted to ensure the efficiency of mitigation measures/ devices and determine if there were any reoccurrence of incidents and confirm closeout.
Fit markers to the earth wire or conductors to improve their visibility to birds in flight.
Illuminate conductors and earth wires for nocturnal birds that fly during periods of low light to reduce recurring power line collision mortality.
Utilise electrical components with safer designs and implement wildlife 'friendly' power structures which maximize the separation between phases and earthed components. For horizontally configured phase designs (e.g., a distribution t-pole), suspending the outer phases below the cross-arm of a power pole greatly improves phase-to-phase separation. For vertical configurations, the vertical separation between phases should be increased to safe levels. Utilities can use angled beams or brackets to make it difficult for birds to perch near energized or earthed components comfortably, thereby discouraging their use of the pole/tower. However, caution should be taken when using these, as they may also provide an angle where nests can be built next to the main pole.
Supplemental perches can be used to lure birds away from parts of a tower or pole where phase-to-phase electrocutions are likely, or where their presence introduces a risk of an air gap breakdown (bird electrocutions occur when the air gap between two energized components, is physically breached by a bird, leading to a short-circuit).
Perch deterrents, such as 'bird guards', prevent birds from perching over critical components such as insulator strings and are, to some extent, successful when implemented correctly. No perch deterrent caters equally well for all species, and utilities must first identify the culprit species in a specific area before deciding on the perch deterrent to use.
Due to increased pollution and the risk of flashovers from conductive materials, the removal of bird nests may be necessary where they have been constructed on or above critical components of power pole/ tower structures. The removal of bird nests from structures should be guided by the internal best practice guidelines for each power utility and general guidelines recommended in documents such as those by the Avian Power Line Interaction Committee (APLIC) (2006). These suggest that active bird nests should not be removed unless the species involved have been positively identified and the utility has the necessary permits to do so. When nest removal is not possible and not recommended due to the species involved, a nest may be moved to another, more favourable location on a pole or tower. As suggested above, is it not recommended that this be done when a nest is still active, as birds are known to abandon their brood in the event of such significant disturbance.

A nest deterrent is a device intended to prevent birds from building or rebuilding a nest on critical positions of a pole/tower, such as directly above a conductor insulator or insulator string. Specific devices are not appropriate for all structure designs, nor all bird species; thus, tailor-made solutions may be necessary.