



22 May 2019
533767

Eskom Holdings SOC Ltd: Western Cape Operating Unit
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Attention: Madré Delpont

Dear Madré

Stormwater Management Plan for the proposed Eskom Grid-Scale Battery Storage at the Paleisheuvel Substation

1 Introduction

SRK Consulting (South Africa) (Pty) Ltd (SRK) was appointed by Eskom Holdings SOC Limited (Eskom) to compile a Stormwater Management Plan (SWMP) as part of an environmental assessment process for the installment of grid-scale battery storage units at Paleisheuvel substation (the site).

1.1 Objectives

The SWMP will include design criteria and commitments that will adhere to internal Eskom objectives and local and national guidelines, which may, amongst others, include the following:

- Protect all life and property from flood damage;
- Protect water resources in the catchment areas from pollution and siltation;
- Protect and enhance the watercourses locally and downstream;
- Conserve the natural flora and fauna in the environment;

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1.2 Project Background

Eskom proposes installing grid-scale battery storage units at existing distribution substations in the Western Cape to strengthen the electricity distribution network and address capacity and/or voltage constraints. The two types of technology alternatives being considered by Eskom for battery storage at the substations are:

- Self-contained (solid state) batteries; and
- Flow batteries.

A single battery technology, or a combination of the technology alternatives, may be implemented. The chemical composition of all the batteries is considered hazardous, and the batteries will therefore be stored in containers and banded.

2 Site Information

The site is located approximately 60 km North of Piketberg, off the R365 within the West Coast District Municipality (see Figure 2-1 below).

The project is situated within Quaternary Catchment G30C, which is a winter rainfall region and receives a Mean Annual Precipitation (MAP) of between 400 and 500 mm, according to the Water Resources (2012) data. At times, large rainfall events might occur in succession that result in the catchment being saturated and generating notable surface flows.

The site area is characterised by relatively flat slopes ranging between 1° and 3°. All surface flow will drain in the direction of the nearest water course to the proposed Paleisheuwel substation, which is located approximately 1.5 km towards the South.

The areas immediately around the site consist predominantly of shrubland (as shown in Photo 2-1 and Photo 2-2) much of which will be cleared for the battery storage containers. The property adjacent to the site consists of agricultural land and solar farms. The soil at the near surface consists of sand. Infiltration in the sandy soils will be high and thus the site will not be prone to ponding or dominant surface flows.



Photo 2-1: Sandy soils with predominantly shrubland (within Eskom's property).



Photo 2-2: Proposed new battery storage area.

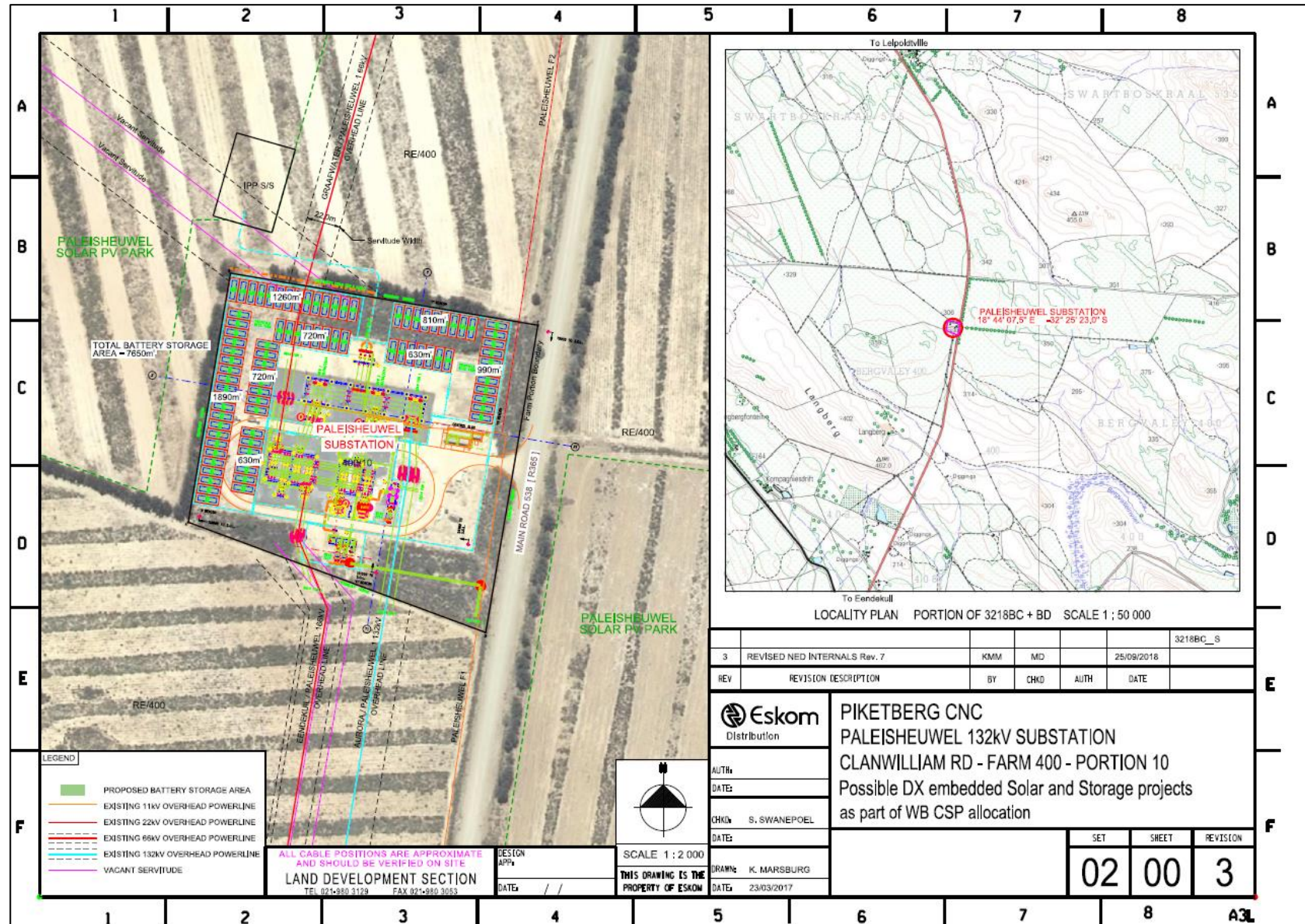


Figure 2-1: Locality map of the existing Eskom Paleisheuvel substation (provided by Eskom).

There are four banded power transformers and no oil dam.

The proposed location of the battery containers (as shown in Photo 2-3) is clear of any water course and shows no ponding after a rain event. The current drainage channels and stormwater systems appear to be efficient on this site (as can be seen on Photo 2-3).



Photo 2-3: The Paleisheuvel substation



Photo 2-4: Elevated platform and barrier around the boundary of the site

Stormwater originating from the substation surface drains via the existing stormwater drainage systems, which channel clean stormwater away from the facility. The elevated platform and barrier around the site should prevent stormwater or surface (sheet) flow from flowing across the site.

The proposed battery storage units are considered to contain hazardous substances (as discussed in section 1.1) and will be stored in containers and banded.

3 Stormwater Management Plan

3.1 Design Phase

During detailed engineering design and planning, the Engineer shall:

- Present designs for the expanded substation and BESS platforms, as well as any new roads.
- Ensure that storm water originating from upgradient (stormwater that could flow across the site from external areas) is diverted around the site.
- Present designs for maintaining the internal stormwater drains.
- Present designs for keeping stormwater separate from contaminated water and banded areas to prevent water pollution.
- Design the drainage systems (of stormwater infrastructure, trenches, drains and outlets) to encourage dissipation of water, decreasing velocity of water and prevent erosion, ponding and flooding of the site and surrounding environment.
- Consider secondary and tertiary containment measures due to the hazardous nature of the battery electrolytes.

3.2 Construction Phase

The following stormwater management measures should be implemented during construction:

- Construct all drainage channels and stormwater drainage systems according to the engineer's design.

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- Install temporary diversion systems / berms around the construction site or at certain problematic areas (including temporary access roads and parking bays) during construction to prevent ponding, flooding or contamination of stormwater with contaminants.
 - Temporary roads should be kept to a minimum to avoid multiple access routes/roads and should only be constructed if absolutely necessary.
 - Temporary parking bays/roads should consist of a compacted coarse gravel layer (if necessary).
 - Any construction material stockpiles should be protected by berms (or another mechanism) to ensure that material cannot be mobilised by runoff and/or potentially block the stormwater system.
 - Place oil traps under stationary machinery, only re-fuel machines at designated fuelling points, immediately clean oil and fuel spills and dispose contaminated material (soil, etc.) at licensed sites only.
 - Ensure that spill kits appropriate to the hazardous substance/s are available at all times on the site.
 - Draw up and strictly enforce a procedure for the storage, handling and transport of the battery containers, and other hazardous materials on site (including fuel storage areas). This procedure should be informed by hazardous material safety data sheets and discussions with the supplier.
 - Ensure vehicles and equipment are in good working order.
 - Ensure that good housekeeping and maintenance rules are applied.
 - Inspect the site weekly for signs of spills.
 - Ensure that onsite sanitation facilities are appropriately designed, are well maintained and serviced regularly.
 - Excavations filled with rain water may be pumped out and the water released into the environment.
 - Handle and store waste in such a way as to prevent mixing with water.

This stormwater plan is to be communicated to all staff.

3.3 Operational Phase

The following stormwater management measures should be implemented during the operational phase:

- Clearly visible signage and emergency numbers shall be placed indicating who to call if any problem with stormwater or any other environmental issues is noticed.
- All necessary spill kits appropriate to the hazardous substance shall be kept on the site.
- All battery containers (hazardous chemicals) shall be banded in accordance with legal requirements and supplier requirements.
- Signs shall be placed on all battery storage areas indicating as a minimum:
 - The battery type (and chemical name/s).
 - Who to contact (immediately) if a spill or leak is noticed.
 - MSDS sheets shall be displayed clearly where batteries are stored. Alternatively available on site.

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- Whenever maintenance staff visit the site the site shall be inspected for:
 - Spills and leaks in/from battery storage areas – if any spills or leaks are found, they will be remediated, and repairs carried out to prevent recurrence.
 - Blockages in stormwater systems.
 - Litter, particularly litter in any stormwater channels, culvert, drains etc. – any litter found shall be removed.
 - New oil or fuel stains from vehicles – if stains are found, the owner of the vehicle with the leak shall be notified and instructed to facilitate remedial measures to the vehicle.
 - Full or faulty bunds and oil/water separators.
 - Training courses shall be run annually for all employees that visit the site (or as needed for new employees) to inform them of the contents of this plan and how to inspect the site and who to inform if issues are noted;
 - The following records shall be kept:
 - A register of spills
 - Incident Management records with the corrective actions taken after spills
 - Waste disposal records
 - Attendance registers for training courses.
 - An inventory of battery types (and associated chemicals) on the site
 - A record of all inspections.


Please contact the undersigned should you have any queries.

Yours faithfully,

SRK Consulting (South Africa) (Pty) Ltd

Prepared by

SRK Consulting - Certified Electronic Signature


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SRK has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional hydrogeological and environmental practices.

4 References

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