REPORT

Scoping Assessment for the Proposed Eskom Komati Solar PV Facility

WSP Africa

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1.0 INTRODUCTION

Golder Associates Pty Ltd (member of WSP) was appointed by Eskom Holdings SOC (Ltd) to provide a scoping assessment for the proposed Eskom Komati Solar Photovoltaics (PV) project. WSP will carry out an Environmental Impact Assessment (EIA) for the Solar PV project in line with World Bank's Environmental and Social Framework, and the South African Legislations. The purpose of this scoping assessment is to provide a description of the proposed project, including a sufficient level of detail to enable stakeholders to identify relevant issues and concerns.

2.0 PROJECT DESCRIPTION

The Eskom Komati Solar PV project will comprise of the following:

The specifications of the Solar PV and Battery Energy Storage System (BESS) project including aspects of construction and operation are outlined below:

- The total site area for PV installation is approximately 200 to 250 hectares to allow for the construction of a PV facility with capacity up to 100 MW and BESS up to 150 MW.
- Solar PV modules, up to a total of approximately 720,000 m^2, that convert solar radiation directly into electricity. The solar PV modules will be above the ground and will be mounted on either fixed tilt systems or tracking systems (comprised of galvanised steel and aluminium). The Solar PV modules will be placed in rows in such a way that there is allowance for a perimeter road and security fencing along the boundaries, and Operation and Maintenance (O&M) access roads in between the PV module rows.
- Inverter stations, each occupying a footprint of approximately 30 m^2, with up to 100 Inverter stations installed on the identified sites. Each Inverter station will contain an inverter step-up transformer, and switchgear. The Inverter stations will be distributed on the site, located alongside its associated Solar PV module arrays. The Inverter station will perform conversion of Direct Current (DC) to Alternating Current (AC), and step-up the LV voltage of the inverter to the appropriate voltage to allow the electricity to be fed into the appropriate substation / grid Point of Connection (PoC). Inverter stations will connect several arrays of Solar PV modules and will be placed along the internal roads for easy accessibility and maintenance.
- Below ground electrical cables with trenching for connecting PV arrays, Inverter stations, O&M buildings, and Combiner Substations.
- Above ground overhead lines for connecting Combiner Substations to grid PoC.
- Adequately designed foundations and mounting structures that will support the Solar PV modules and Inverter stations.
- Access roads to the Komati PV sites.
- Perimeter roads around the PV sites.
- Internal roads for access to the Inverter stations.
- Internal roads/paths between the Solar PV module rows, to allow access to the Solar PV modules for O&M activities.
- Infrastructure required for the operation and maintenance of the Komati PV installations:
  - Meteorological Station
  - O&M Building – comprising control room, server room, security equipment room, offices, boardroom, kitchen, and ablution facilities (including water supply and sewage infrastructure).

  - Spares Warehouse and Workshop.
  - Hazardous Chemical Store – approx. 30 m^2 .
  - Security Building.
  - Parking areas and roads.
- Small diameter water supply pipeline from existing supply infrastructure.
- Fire water supply during Construction and Operation.
- Sewage interconnection to existing infrastructure.
- Stormwater channels.
- Perimeter fencing of the Komati PV sites, with access gates.
- Temporary laydown area, occupying a footprint up to approx. 10 hectares. The laydown area will be used during construction and rehabilitated thereafter.
- Temporary concrete batching plant, occupying a footprint up to approx. 1 hectare. The concrete batching plant area will be used during construction and rehabilitated thereafter.
- Temporary site construction office area, occupying a footprint up to approx. 1 hectare. This area will accommodate the offices for construction contractors during construction and rehabilitated thereafter.

3.0 BACKGROUND

Eskom Holdings SOC (Ltd) is a South African utility that generates, transmits and distributes electricity. Eskom supplies about 95 % of the country's electricity. Eskom's 2035 strategy encompasses the journey that Eskom intends to take in response to the changing energy environment and the impact this has towards a sustainable power utility. This strategy is necessitated by the challenges that Eskom faces as a business as well as the global and local shifts occurring in the energy sector particularly with respect to environmental and climate change challenges, difficulties in accessing financing and changes to the macro industry environment significantly altering the energy supply industry (ESI).

The road to 2035, includes the shutting down of a number of coal-fired power stations by 2035, repurposing and repowering, delivering new clean generation projects, expanding the transmission grid, and rolling out micro grid solutions.

Several power stations are reaching the end of life. These stations will go into extended cold reserve and are most likely to be fully decommissioned in the future. Eskom is considering a shutdown, dismantling and repurposing of some of its fleet as it reaches its end of life. Komati Power Station, situated in Mpumalanga will reach its end-of-life expectancy in September 2022.

Eskom is proposing the establishment of a solar electricity generating facility and associated infrastructure as part of its repurposing programme for Komati Power Station. The plan is to install 100 MW of Solar PV and 150 MW of BESS.

4.0 PROJECT LOCATION AND EXTENT

The Komati Power Station is situated about 37 km from Middelburg, 43 km from Bethal and 40 km from Witbank, via Vandyksdrift in the Mpumalanga Province of South Africa. The station is located in the Steve Tshwete Municipality, along the R35 as shown in Figure 1. The GPS coordinates for the power plant is: 26.0896668 S, 29.4655907 E. The station has a total of 9 units, five 100 MW units on the east (Units 1 to 5) and four 125 MW units on the west (Units 6 to 9), with a total installed capacity of 1000 MW. Its units operated on a simple Rankine Cycle without reheat and with a low superheat pressure, resulting in a lower thermodynamic efficiency (efficiency up to 27 %). Komati Units are small and have a higher operating & maintenance cost per megawatt generated compared to modern newer stations. Komati Power Station will reach its end-of-life expectancy in September 2022 when Unit 9 will have reached its Dead Stop Date (DSD). Units 1 to 8 have already reached its DSD.

The parcels of land in Komati for the proposed development is provided in Figure 2. The identified parcels of land are owned by Eskom.

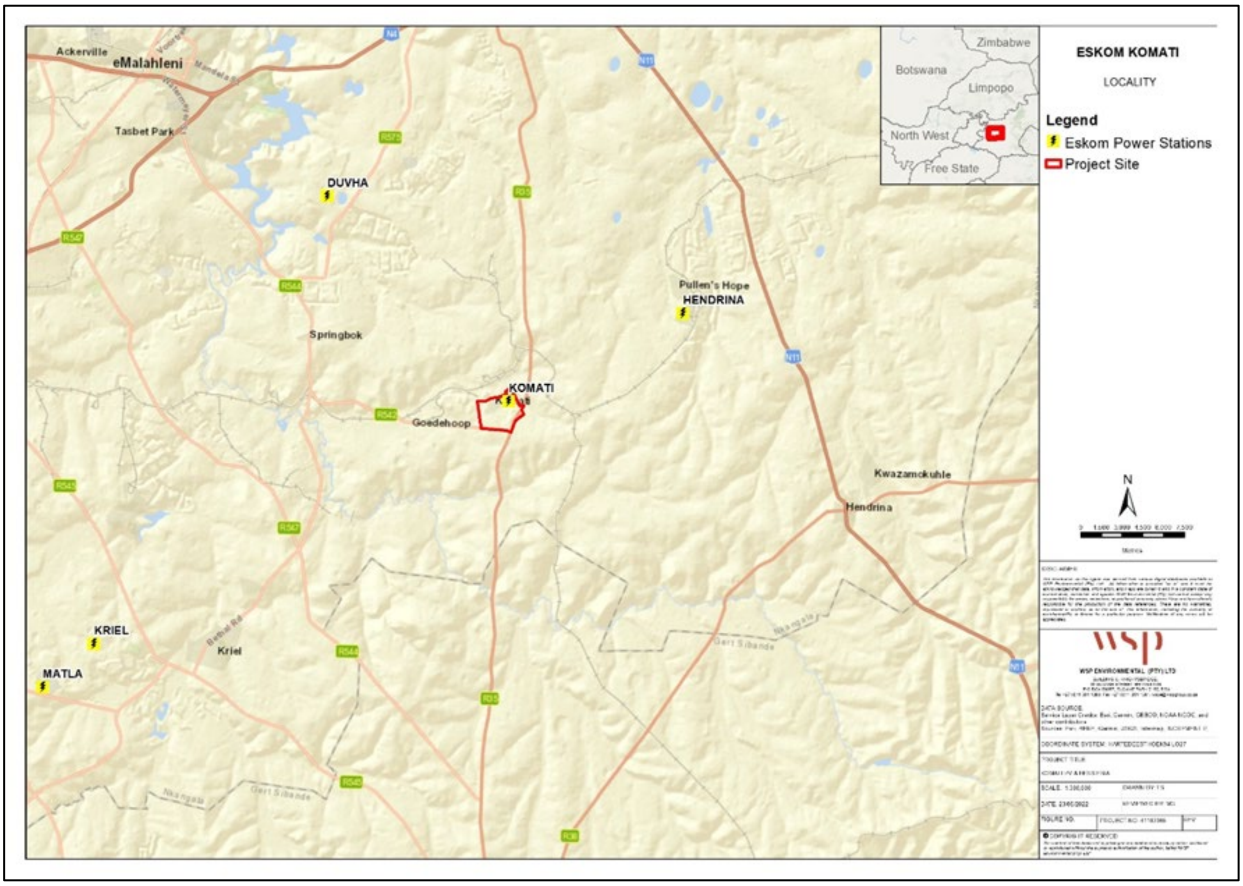


Figure 1: Locality Map

Figure 2: Site layout and proposed PV sites

5.0 APPLICABLE LEGISLATION, GUIDELINES AND STANDARDS

5.1 The World Bank Environmental and Social Framework

The World Bank Environmental and Social Framework sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, with the aim of ending extreme poverty and promoting shared prosperity.

The ten Environmental and Social Standards establish the standards that the Borrower and the project will meet through the project life cycle, as follows:

- Environmental and Social Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.
- Environmental and Social Standard 2: Labour and Working Conditions.
- Environmental and Social Standard 3: Resource Efficiency and Pollution Prevention and Management.
- Environmental and Social Standard 4: Community Health and Safety.
- Environmental and Social Standard 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.
- Environmental and Social Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- Environmental and Social Standard 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities.

- Environmental and Social Standard 8: Cultural Heritage.
- Environmental and Social Standard 9: Financial Intermediaries.
- Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure.

5.2 The National Water Act (Act 36 of 1998)

Water resources management in South Africa is governed by the National Water Act (Act 36 of 1998) (NWA). The Department of Water and Sanitation (DWS) must, as custodians of water, ensure that resources are used, conserved, protected, developed, managed, and controlled in a sustainable manner for the benefit of all persons and the environment.

5.3 The use of Water for Mining and Related Activities

Government Notice 704 (Government Gazette 20119 of June 1999) (hereafter referred to as GN704), was established to provide regulations on the use of water for mining and related activities aimed at the protection of water resources. The three main conditions of GN704 applicable to this project are:

- No residue or substance which causes or is likely to cause pollution of a water resource may be used in the construction of any dams, impoundments or embankments or any other infrastructure which may cause pollution of a water resource.
- Clean and dirty water systems must be kept separate and must be designed, constructed, maintained and operated to ensure conveyance of the flow of a 1:50-year recurrence interval storm event. Clean and dirty water systems should therefore not spill into each other more frequently than once in 50-years. Any dirty water dams should also have a minimum freeboard of 0.8 m above the full supply level.
- All dirty water or substances which may cause pollution should be prevented from entering a clean water resource (by spillage, seepage, erosion etc.) and it should be ensured that water used in any process is recycled as far as practicable.

5.4 South African Water Quality Guidelines

The NWA, Section 21 (f) and (g), states that the discharging of water containing waste into a water resource and disposing of waste which may detrimentally impact on a water resource should be prevented. The South African Water Quality Guidelines (SAWQG) are a series of documents published by (Department of Water Affairs) DWA, which forms an integral part of the water quality management strategy to safe keep and maintain the water quality in South Africa. These guidelines are used by the DWA as a primary source of information and decision-support to judge the fitness for use of water and for other water quality management purposes. The content of the SAWQG provides information on the ideal water quality and acceptable concentrations for various constituents of concern.

5.5 National Environmental Management Act

The National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998) covers the control and management of environmental impacts and, *inter alia*, provides a framework for measures that “prevent pollution and ecological degradation; promotes conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development

6.0 BASELINE OVERVIEW

6.1 Climate

6.1.1 Rainfall

The rainfall data was generated using a rainfall simulator which was sourced through the Design Rainfall Estimation Program (Smithers & Schulze, 2002) and the Daily Rainfall Extraction Utility (Kunz, 2004). Data was sourced for rainfall stations that are within close proximity to the study area. The rainfall stations presented in Table 1 summarize the rainfall data used in the analysis.

Table 1: Metadata for the rainfall stations

Station number	Name	Distance (km)	Record period (years)	Period of records	Reliability (%)	MAP (mm)
0478577 W	Vaalkraanz	11.4	80	1920 - 2000	11.7	693
0478546 W	Vandyksdrift	11.8	80	1920 - 2000	59.8	686
0478786 W	Blinkpan (Pol)	2.5	80	1920 - 2000	25	643

6.1.1.1 Comparison of rainfall stations

The average monthly plot was used to compare the rainfall records as shown in Figure 3. The rainfall records cover the same time periods, and the average monthly rainfall depths for the different stations have a similar pattern. During the wet season, the highest average rainfall was recorded in the month of January. The driest month on average was recorded in the month of July.

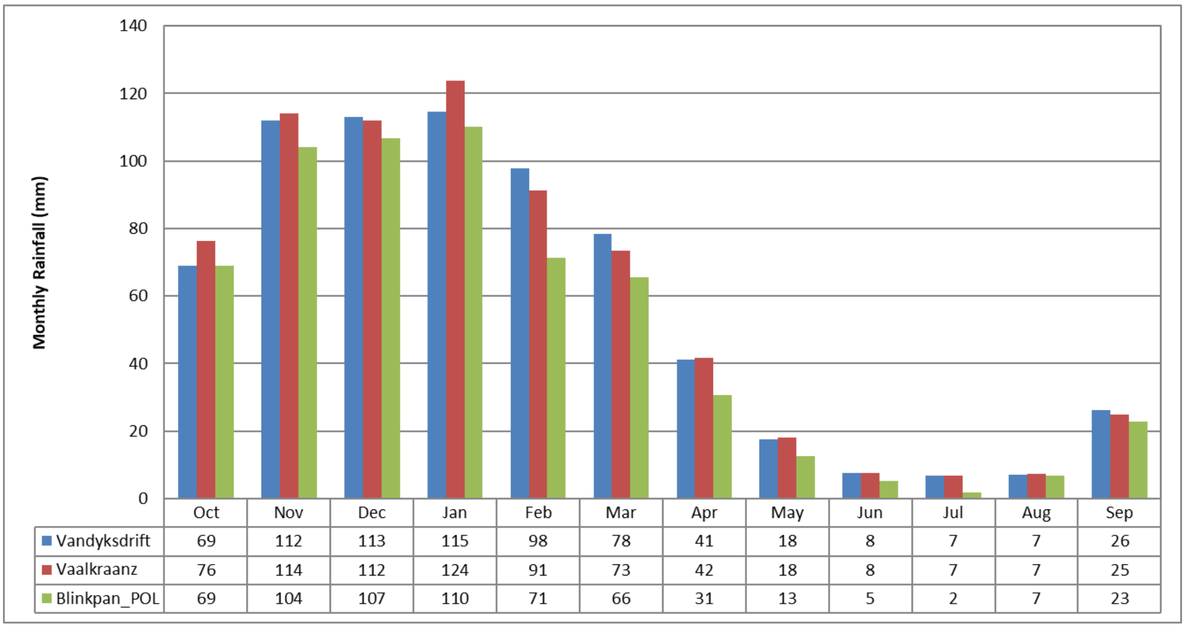


Figure 3: Average monthly rainfall for the stations

The Vandyksdrift, Vaalkraanz and Blinkpan (POL) rainfall stations show a similar increasing trend as observed in Figure 4. The trends are consistent throughout, with no significant changes in slope. Figure 4 shows the total cumulative rainfall over time.

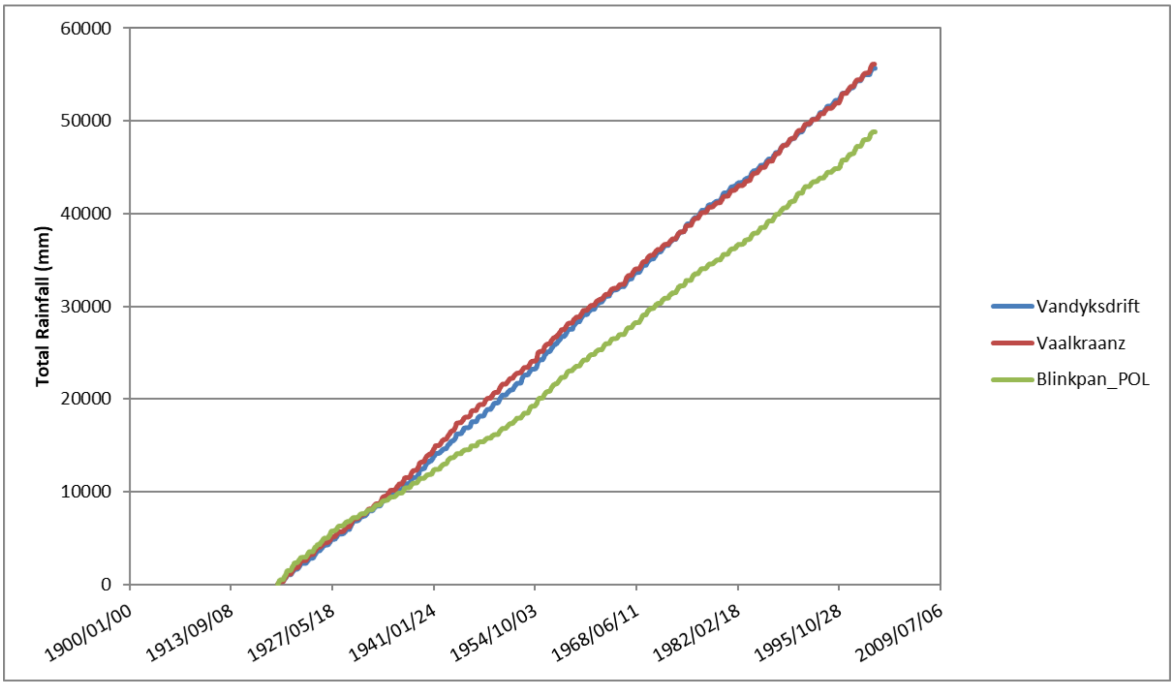


Figure 4: Cumulative rainfall for the stations analyzed

The station 0478546 W Vandyksdrift was chosen as the station that is representative of the study for the following reasons:

- The station is within proximity of the site.
- The station has the highest reliability data set (having the lowest percentage of patched or missing data).
- The station has long duration of recorded data.

6.1.1.2 Vandyksdrift rainfall station

Vandyksdrift rainfall station is situated approximately 12 km from the site with 80-years of recorded data. It has the highest reliability (less patched data) of the analysed stations. The maximum recorded 24-hour rainfall depth is 97 mm, recorded on the 26th of April 1960, as shown in Figure 5. Figure 6 shows the annual rainfall depths. The mean annual precipitation for the station is 693 mm.

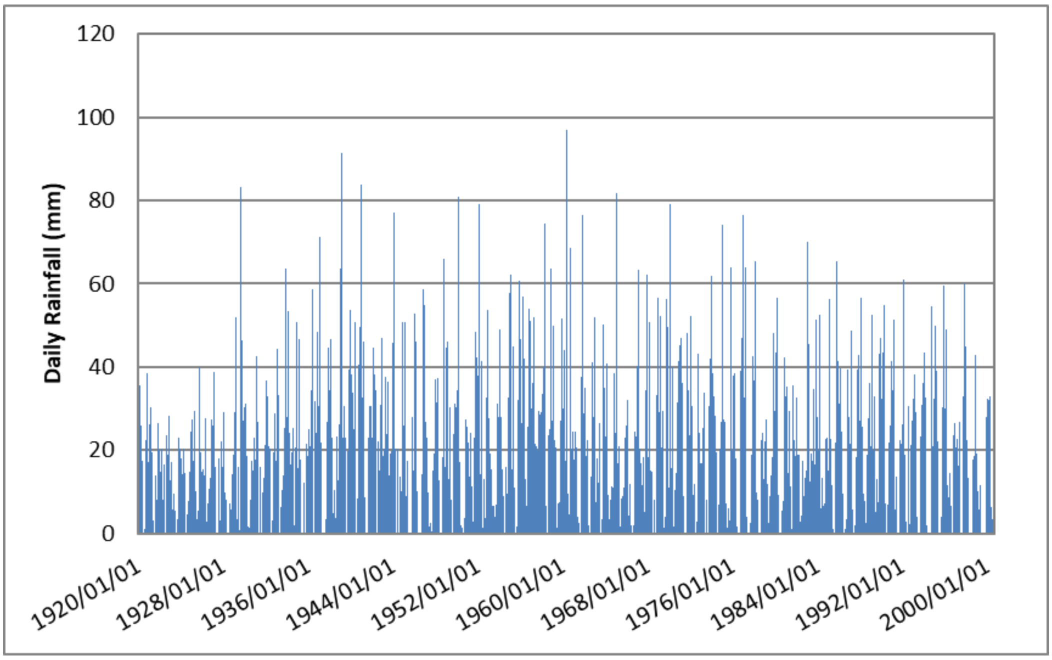


Figure 5: Vandyksdrift weather station daily rainfall

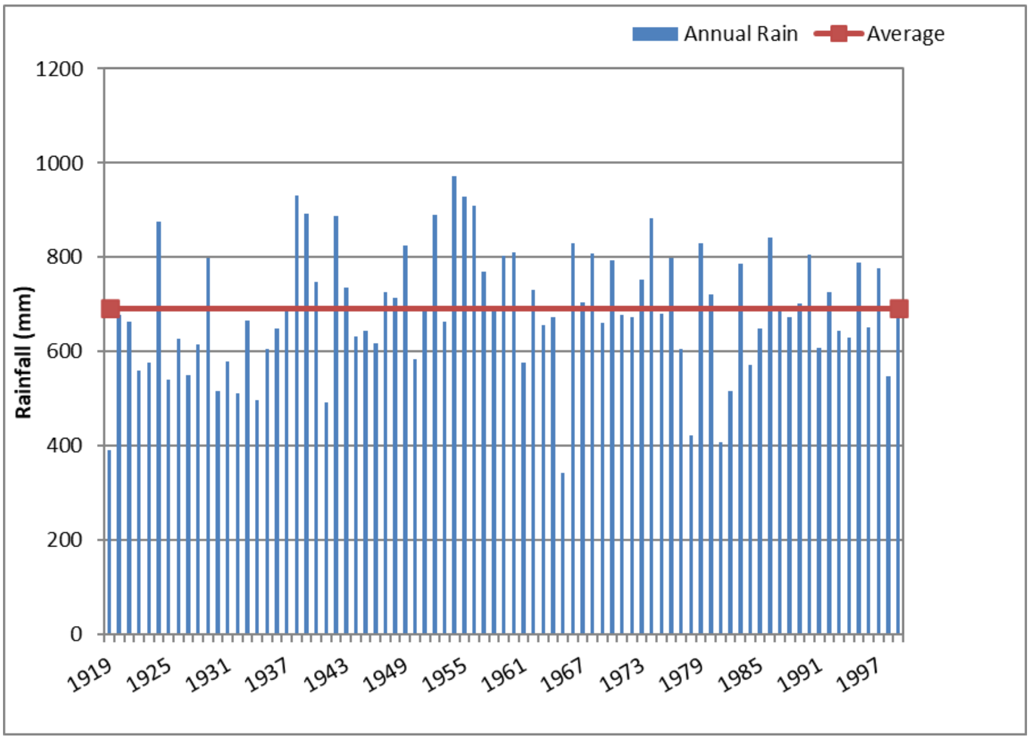


Figure 6: Vandyksdrift weather station annual rainfall readings and mean annual precipitation (MAP)

6.1.1.3 Design rainfall estimation

The 24-hour rainfall depths for several recurrence intervals at the Vandyksdrift station were calculated from the data available. To determine the likely magnitude of storm events, a statistical approach, using chi square statistics method (NIST/SEMATECH e-Handbook of Statistical Methods), was applied to the available recorded daily rainfall depths. This method statistically analyses the maximum daily rainfall depths for each year to determine the different recurrence intervals. The probability distribution with the best fit (R^2=0.993) was found to be the Pearson III distribution (see Figure 5), this was used to estimate the 24-hour storm rainfall depths associated with the various recurrence intervals as summarised in Table 2.

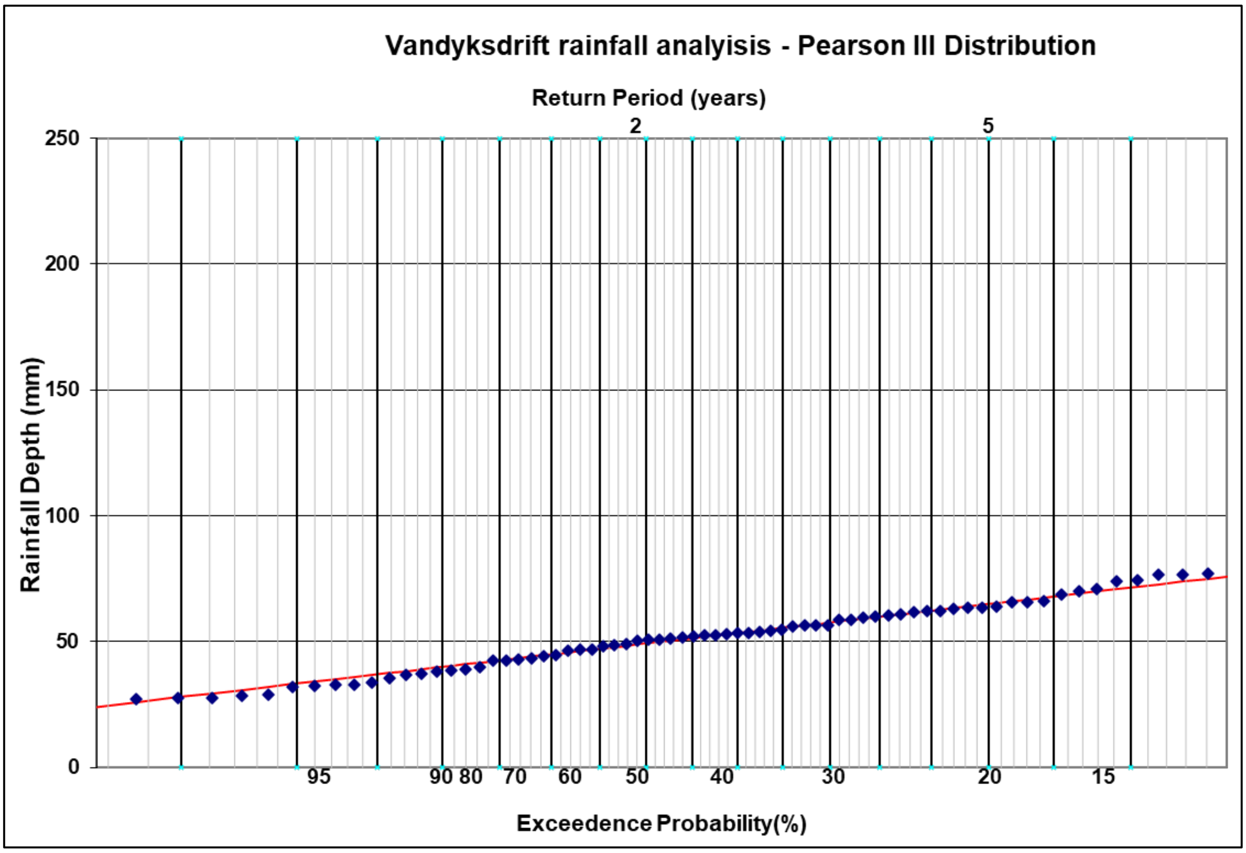


Figure 5 : Vandyksdrift Pearson III distribution

Table 2: Computed 24-hour rainfall depths for various annual recurrence intervals

Return period in years	5	10	20	25	50	100	200	500	100
24-hours Rainfall Depth (mm/d)	68	76	83	85	91	96	101	107	112

6.1.2 Evaporation

The average S-Class pan evaporation is 2087.9 mm/year measured at B1E002 station. The station is approximately 13 km away from the site area. The highest average monthly evaporation occurs in November, as shown in Table 3. Figure 7 plots the monthly average evaporation and the monthly average rainfall readings for the Komati area. From the figure, it is observed that the mean annual evaporation is generally higher than the rainfall throughout the year.

Table 3: Average S-Pan evaporation

Month	S-Pan evaporation (mm/month)
January	200.9
February	163.5
March	193.8

Month	S-Pan evaporation (mm/month)
April	161.9
May	139.3
June	113.1
July	120.6
August	161.2
September	187.7
October	199.9
November	214.8
December	212.7
Total	2069.4

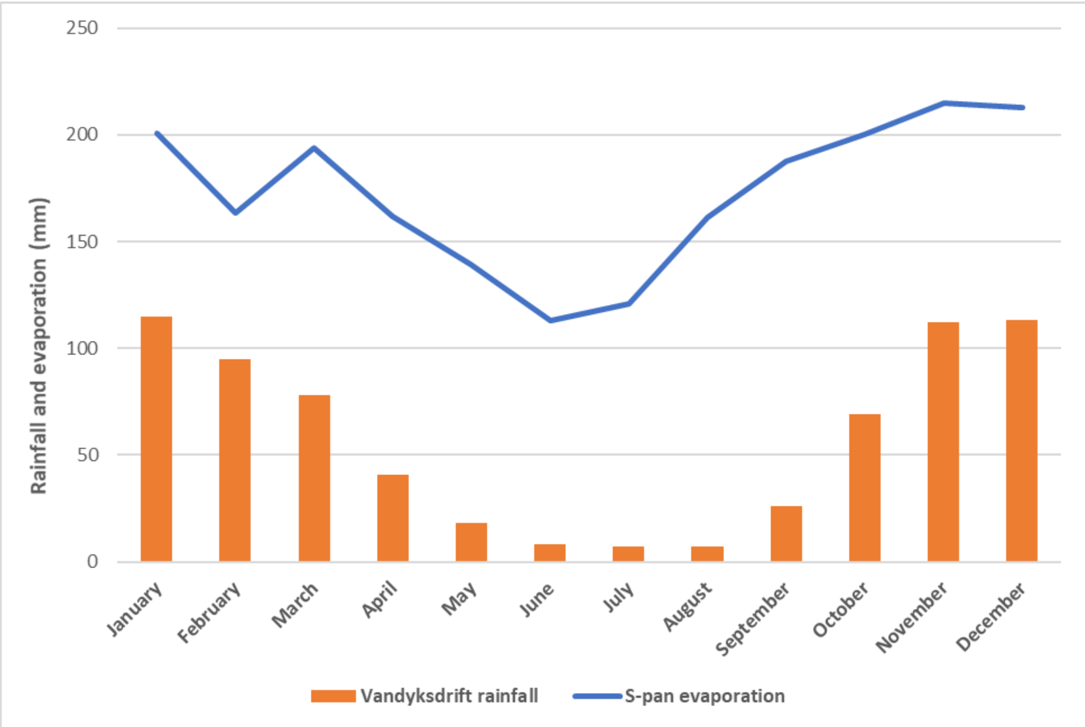


Figure 7: Rainfall and evaporation comparison

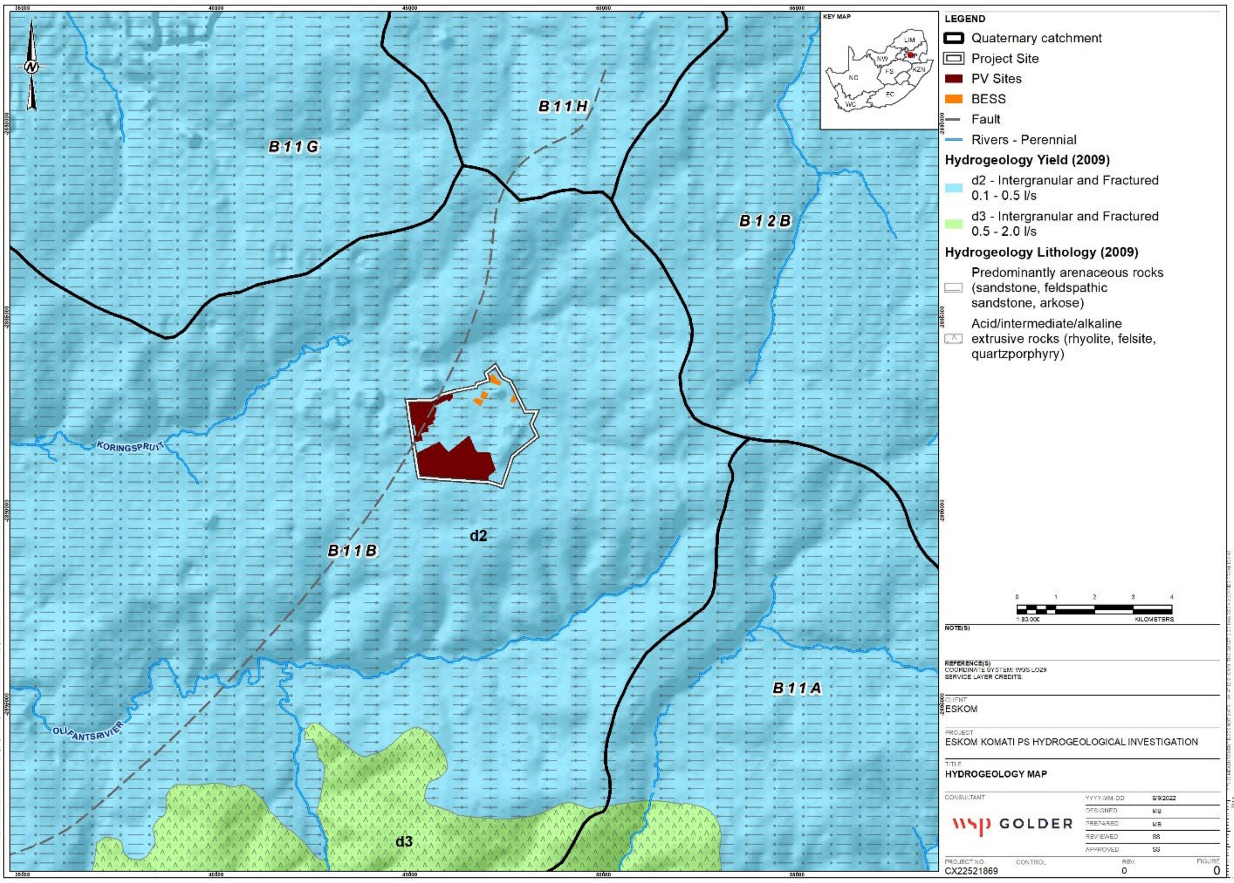
6.2 Temperature

According to GHT Consulting, average daily maximum temperatures in the Komati area vary from 27°C in January to 17°C in July, but in extreme cases these may rise to 38°C and 26°C, respectively. In comparison, average daily minima of 13°C and 0°C can be expected, with temperatures falling to 1 and –13°C, respectively, on unusually cold days. Frost conditions are also common over the 120-day period from May to September.

7.0 HYDROLOGICAL DESCRIPTION

7.1 Catchment description

Komati Power Station occurs within the upper Olifants Water Management Area (WMA), in the B11B quaternary catchment and can be sub-divided into secondary drainage regions compromising of smaller streams and creeks. This catchment receives 687 mm rainfall per year and experiences 1 550 mm of evaporation annually. The surface topography of the area is typical of the Mpumalanga Highveld, consisting in the main of a gently undulating plateau. The flood plains of the local streams are at an average elevation of approximately 1595 meters above mean sea level (mamsl). Altitudes vary from ±1650 mamsl at the higher parts south of the ashing facility to ±1595 mamsl which defines the base of the Koring Spruit to the north of the Komati Power Station.



8.0 IMPACT ASSESSMENT

Based on the existing information in the area, a preliminary impact assessment was conducted and outlined in the section below. The impacts will be verified by relevant specialists during the EIA Phase. The key issues and concerns for the surface water study have been unpacked in the subsections below.

8.1 Major areas of concern for surface water impact

The following section describes those activities that would have an impact on the surface water resources in the area in which the associated activities are proposed. For the purposes of this scoping impact assessment, the proposed project has been subdivided into the construction, operational, and closure phases. The cumulative impacts will only be included in the EIA phase.

The major activities of concern relating to the surface water resources are:

Construction phase

- Contamination of stormwater runoff;
- Erosion at the construction site.

Operational phase

- Contamination of stormwater runoff;
- Erosion during operation;
- Flooding.

Closure/decommissioning phase

- Contamination of stormwater runoff.

8.2 Impact assessment methodology

The significance of the identified impacts on the various environmental components were determined using the approach outlined below. An impact screening tool has been used in the scoping phase. The screening tool is based on two criteria, namely probability; and consequence (Table 6), where the latter is based on general consideration to the intensity, extent, and duration.

The scales and descriptors used for scoring probability and consequence are detailed in Table 4 and Table 5 respectively.

Table 4: Significance screening tool

	Consequence scale				
Probability scale		1	2	3	4
	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	High

Table 5: Probability scores and descriptors

Score	Descriptor
4	**Definite**: The impact will occur regardless of any prevention measures
3	**Highly Probable**: It is most likely that the impact will occur
2	**Probable**: There is a good possibility that the impact will occur
1	**Improbable**: The possibility of the impact occurring is very low

Table 6: Consequence score descriptions

Score	Negative	Positive
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: A long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial: A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
2	Moderately severe: A medium to long term impacts on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	Negligible: A short to medium term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.	Negligible: A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

The nature of the impact must be characterized as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system (Table 7) has been applied according to the nature and significance of the identified impacts.

Table 7: Impact Significance Colour Reference System to indicate the Nature of the impact

Negative Impacts (-ve)	Positive Impacts (+ve)
Negligible	Negligible
Very Low	Very Low
Low	Low
Medium	Medium
High	High

8.3 Construction phase impacts

During the construction phase of the solar PV project, the following activities are anticipated:

- **Site Preparation** - Vegetation and topsoil will be cleared for the footprint of the infrastructure as well as for the access roads to the solar PV site, internal roads and the laydown yard, etc. The topsoil removed will need to be stored for rehabilitation purposes of the site.

- **Transportation of Equipment** - All equipment to site will be transported by means of national, provincial and district roads. This includes but is not limited to, transformers, solar PV modules, inverters, excavators, graders, trucks, compacting equipment, construction material, etc.
- **Site Establishment Works** - The site will have temporary laydown areas and offices for the construction contractors. This will include the contractor's chosen electricity supply infrastructure e.g., use of generators and fuel storage that will be required to conform to acceptable measures to ensure no harm to the environment. The laydown area will also be used for assembling of solar PV modules and structures. A concrete batching plant may also be required as part of the site establishment works.
- **Construction of the Solar PV Facility** - Trenches would need to be excavated for underground cabling to connect Solar PV arrays, Inverter stations, and Combiner Substations. Foundations for the solar PV array mounting structures and Inverter stations may need to be excavated, with the final extent depending on the geotechnical studies that will be conducted. The geotechnical studies will determine the type of foundations that can be implemented at the PV site. Construction of access, perimeter, and internal gravel roads may require material to be imported from outside the site, from a permitted quarry.
- **Water consumption during construction phase** - The water consumption during the construction phase is estimated as 15,000 kilolitres (total for construction period estimated as 24-months) - The Contractor should in any case be made responsible for securing electricity, water, and any other services during construction.
- **Construction of Electrical Interconnection Line** - Construction and installation of overhead electrical interconnection lines, connecting the Solar PV facilities to the grid PoC.
- **Storage of diesel and oil for construction activities**.

Once all the construction activities are completed the site will be rehabilitated where possible and practical. All temporal structures and facilities will be removed from site and the area rehabilitated.

The associated impacts in the construction phase for the abovementioned activities are described in the following section:

8.3.1 Contamination of stormwater runoff

Stormwater runoff could, in the case of the temporary construction yards, laydown areas, and offices for the construction workers, potentially come in contact with areas dedicated for the handling of contaminants.

The contaminants from areas in which contractor vehicles and equipment are housed, as well as from the areas in which the construction vehicles and equipment are being used, will include hydrocarbons that may be spilled or leaked during use. This could result in contaminated stormwater runoff being discharged downstream. During construction, it is expected that the magnitude of the impact will be **low** and will require mitigation to reduce the risk.

8.3.1.1 Mitigation

The following mitigation measures are proposed:

- Ensure clean-up of hydrocarbon spills from machinery is done immediately, and contaminated soils disposed of to a permitted site.
- After construction, the land must be cleared of debris, surplus materials, and equipment. All parts of the land must be left in a condition as close as possible to that prior to construction.

Should the measures described above be implemented during construction, then the impact significance will reduce to **low – very low**.

8.3.2 Erosion during construction

Soil stripping, stockpiling, excavations of underground cabling, foundations for the solar PV array mounting structure and construction of stormwater berms may result in loss of soils through erosion, particularly for topsoil stockpiles with unvegetated steep slopes, resulting in increased sedimentation to water resources.

The removal or disturbance of vegetation during the construction of roads could result in the concentration of flow and consequently in accelerated erosion along roads where steep slopes dominate, which will result in an increase of suspended solids and sedimentation of the downstream environment. Erosion of the proposed roads is further possible at watercourse crossings due to the concentration of flow. Removal or disturbance of vegetation from areas such as new roads, the construction yards and the substation / control building could also result in erosion due to the soil stability being affected. During construction, it is expected that the magnitude of the impact will be **moderate** and will require mitigation to reduce the risk

8.3.2.1 Mitigation

The following mitigation measures are proposed:

- Avoid clearing during the wet season when short heavy downpours can be expected. This should help to limit erosion.
- Minimize the extent of earthworks.
- Encourage the use of natural flow paths downstream of construction sites.
- The discharge of stormwater should be spread over a wide area to reduce the energy as a result of concentrated flow and return to dispersed flow downstream of the construction site.
- Re-use stockpiled soil within as short a period as possible.

Should the measures described above be implemented during construction, then the impact significance will reduce from **moderate – very low**.

8.4 Operation phase impacts

During the operation phase of the solar PV project, the following activities are anticipated:

- During the life of the Solar PV facility, there will be normal maintenance of all electrical and mechanical components of the plant.
- In addition, there will be periodic cleaning and washing of the solar PV modules. This PV module cleaning will be performed when required, and it is estimated to occur 2-4 times a year.
- The water consumption during operation - estimated water required per year during operation is 10,000 kilolitres (total per year for the design life of plant).

The associated impacts in the operation phase for the abovementioned activities are described in the following section:

8.4.1 Flooding

In the operation phase, soil compaction and erosion may occur due to vehicle movement during routine maintenance. This activity will lead to an increase in impervious surfaces. This activity, however, will only occur occasionally and has therefore been considered to be infrequent and negligible. The impact significance is expected to be **low.**

8.4.1.1 Mitigation

Protect structures such as the solar PV bases and substation / control building from localised flooding by constructing cut-off berms / diverting flow on the uphill side in flood prone areas.

Should the measures described above be implemented during the operation phase, the impact significance will reduce from **low – very low.**

8.4.2 Contamination of stormwater runoff

Stormwater runoff in the vicinity of the substation / control building and solar PV's could come into contact with dedicated areas where hazardous substances are handled such as fuels and oils which could result in contaminated stormwater runoff being discharged downstream. Furthermore, typical activities during maintenance include washing of solar panels with water that includes chemicals. This water could also potentially contaminate nearby watercourses. This PV module cleaning will be performed when required 2 – 4 times a year and has therefore been considered to be infrequent and negligible.

During the operational phase, it is expected that the magnitude of the impact will be **low** and will require mitigation to reduce the risk.

8.4.2.1 Mitigation

- Prevent stormwater runoff to come in contact with dedicated areas where hazardous substances are handled, by diverting flow with berms and cut-off drains to divert stormwater runoff away from the site and discharge diverted stormwater as per pre-development conditions, and good house-keeping.
- Clean solar panels with water that contains no chemicals.

8.4.3 Erosion during operation

In the operational phase, the potential impacts due to the additional hardened surfaces include erosion of the surrounding environment. Eroded soil particles carried to downstream water resources can also result in the decrease in quality of nearby watercourses, due to sedimentation. The impact significance in the operation phase is expected to be **moderate**.

8.4.3.1 Mitigation

In summary, the following mitigation measures are proposed:

- Design stormwater management facilities to comply with regulation GN 704.
- Stormwater infrastructure installed to mitigate possible hydrological impacts must be regularly maintained throughout the lifespan of the infrastructure to ensure its optimum functionality.
- Apply erosion protection measures such as stonepitching downstream of steep roadside channels.

Should the measures described above be implemented during the operation phase, the impact significance will reduce from **moderate – very low**.

8.5 Closure/decommissioning

The aim of the rehabilitation is to bring back the work site to a stabilised condition, as close as possible to pre-construction conditions and to the satisfaction of the landowner. Once all the construction activities are completed the site will be rehabilitated where possible and practical. All temporal structures and facilities will be removed from site and the area rehabilitated. The rehabilitation of the area would entail the following activities:

- Removal of PV modules;
- Removal of associated infrastructure;

- Land reform.

8.5.1 Contamination of stormwater runoff

Similarly, to the construction phase, the runoff during the rehabilitation (decommissioning/ closure) phase may contain contaminants. In addition, soil compaction to reshape the landform may cause increased runoff which may still contain higher concentrations of contaminants and sediment.

The magnitude is therefore rated as low, with a short-term duration, extending to the site. The probability is low with the resultant impact significance of the runoff during rehabilitation expected to be **low**.

8.5.1.1 Mitigation

All pollution control mechanisms are to be in accordance with GN 704, and all necessary pollution control mechanisms must be protected and repaired or established when stockpiles or residue deposits are reclaimed, removed, or rehabilitated so that water pollution is minimized and abated.

Should the measures described above be implemented then the impact significance should be reduced from **low – very low**.

8.6 Impact Assessment summary

The predicted environmental impacts resulting from the proposed project activities in the scoping phase are listed in Table 8, along with their significance ratings before and after mitigation

Table 8: Impact assessment summary

Project Name	Eskom Komati Solar PV Surface Water Impact Assessment																		
Impact Assessment																			
CONSTRUCTION																			
Impact number	**Aspect**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**	**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	**Rating**
Impact 1:	Stormwater runoff	Stormwater runoff could, in the case of the temporary construction yards, laydown areas, and offices for the construction workers, potentially come in contact with areas dedicated for the handling of contaminants.	Construction	Negative	Moderate	4	1	3	2	2	**20**	**N2**	2	1	1	2	2	**12**	**N1**
					Significance	**N2 - Low**							**N1 - Very Low**						
Impact 2:	Erosion	Soil stripping, stockpiling, excavations of underground cabling, foundations for the solar PV array mounting structure and construction of stormwater berms may result in loss of soils through erosion, particularly for topsoil stockpiles with unvegetated steep slopes, resulting in increased sedimentation to water resources	Construction	Negative	Moderate	2	2	3	2	4	**36**	**N3**	2	1	1	2	2	**12**	**N1**
					Significance	**N3 - Moderate**							**N1 - Very Low**						
OPERATIONAL																			
Impact number	**Receptor**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**		**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	
Impact 1:	Flooding	In the operation phase, soil compaction and erosion may occur due to vehicle movement during routine maintenance. This activity will lead to an increase in impervious surfaces. This activity, however, will only occur occasionally and has therefore been considered to be infrequent and negligible.	Operational	Negative	Moderate	3	1	3	2	2	**18**	**N2**	2	1	1	2	2	**12**	**N1**
					Significance	**N2 - Low**							**N1 - Very Low**						
Impact 2:	Stormwater runoff	Stormwater runoff in the vicinity of the substation / control building and solar PV's could come into contact with dedicated areas where hazardous substances are handled such as fuels and oils which could result in contaminated stormwater runoff being discharged downstream. Furthermore, typical activities during maintenance include washing of solar panels with water that includes chemicals. This water could also potentially contaminate nearby watercourses.	Operational	Negative	Moderate	4	1	3	2	2	**20**	**N2**	2	1	1	2	2	**12**	**N1**
					Significance	**N2 - Low**							**N1 - Very Low**						
Impact 3:	Erosion	In the operational phase, the potential impacts due to the additional hardened surfaces include erosion of the surrounding environment. Eroded soil particles carried to downstream water resources can also result in the decrease in quality of nearby watercourses, due to sedimentation.	Operational	Negative	Moderate	2	2	3	2	4	**36**	**N3**	2	1	1	2	2	**12**	**N1**
					Significance	**N3 - Moderate**							**N1 - Very Low**						
DECOMISSIONING																			
Impact number	**Receptor**	**Description**	**Stage**	**Character**	**Ease of Mitigation**	**Pre-Mitigation**							**Post-Mitigation**						
						(M+	**E+**	**R+**	**D)x**	**P=**	**S**		**(M+**	**E+**	**R+**	**D)x**	**P=**	**S**	
Impact 1:	Stormwater runoff	Similarly, to the construction phase, the runoff during the rehabilitation (decommissioning/ closure) phase may contain contaminants. In addition, soil compaction to reshape the landform may cause increased runoff which may still contain higher concentrations of contaminants and sediment.	Decommissioning	Negative	Moderate	4	1	3	2	2	**20**	**N2**	2	1	1	2	2	**12**	**N1**
					Significance	**N2 - Low**							**N1 - Very Low**						

9.0 PLAN FOR EIA PHASE

An in-depth impact assessment will be conducted during the EIA Phase, which will include an assessment of the potential impacts associated with the proposed development on the features present on site and the mitigation measures to be implemented to adequately protect these features. The impacts to be assessed will include:

- Assessment of water quality changes.
- Assessment of hydrology (stormwater management).
- Assessment of the cumulative impacts of the proposed development.

10.0 CONCLUSION AND RECOMMENDATIONS

Due to the nature of the construction activities, it can be concluded that the majority of the surface water impacts would be of a water quality nature. The potential impacts primarily include erosion and stormwater runoff coming in contact with areas dedicated to collection, containment and treatment of hazardous substances such as fuel storage areas as well as localized flooding. Mitigation measures must be put into place to prevent or reduce the impact on the downstream environment.

Stormwater management is required both during and after the construction of the solar PV to prevent damage to property, degradation of the water quality in nearby water resources and negative impacts to the surrounding environment. The impacts during construction phase are temporary, while impacts during operational phase are permanent and could result in a greater cumulative impact, which will be addressed in the EIA phase. Impacts during both these phases should be controlled at the source, to minimize or prevent the long-term and short-term impacts.

11.0 REFERENCES

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https://golderassociates.sharepoint.com/sites/161403/project files/6 deliverables/22521869-352927-1_eskomeia/22521869-352927-1_eskom eia report_final_15072022.docx

APPENDIX A

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