Aquatic Ecosystem Opinion Report: Proposed solar energy plant at Struisbult 104 Portion 1 at Copperton, Northern Cape Province February 2022

Prepared By:

Ms. Toni Belcher

Tel: (082) 883 8055

E-mail: toni@bluescience.co.za

1. INTRODUCTION AND BACKGROUND

It is proposed to construct a solar energy plant on the farm Struisbult (Farm No. 104 Portion 1, also known as Vogelstruisbult), near Copperton in the Northern Cape (Figure 1). A 1 km loop in loop out connection (two lines) will need to be constructed to connect the solar energy facility to an existing 132kV line as well as a new 132kV single line of 8.8km between Cuprum and Kronos that will be along an existing powerline servitude. The site is located approximately 30 km west of Prieska and 10 km northeast of Copperton. The area surrounding Copperton includes the town, disused mine structures, Copperton and Garob Wind Energy Facilities that are under construction and farmed areas. Several Eskom powerlines and substations occur in the area, as well as three operational Solar PV Facilities.

The majority of the landscape consists of flat to slightly undulating plains with shallow valleys that are drained by tributaries of the Basterspute se Leegte River, a northward-flowing tributary of the lower Orange River. Table 1 provides an overview and summary of the water resource information for the study area.

Table 1: Key water resources information for the proposed project development area

Descriptor	Name / details	Notes
Water Management Area	Lower Orange WMA	None
Catchment Area	Basterspute se Leegte River	Upper tributary of the Hartbees Tributary, Lower Orange River
Quaternary Catchment	D54G	None
Present Ecological State	Not assessed/episodic watercourses	DWS (2012) assessment for the upper Basterspute se Leegte tributaries
Ecological Importance and Ecological Sensitivity	Low	
Location of the center of the site	29°49'24.95"S	Latitude
	22°22'43.65"E	Longitude

2. DESCRIPTION OF THE STUDY AREA AND ASSOCIATED AQUATIC FEATURES

The larger Struisbult Farm has low relief with shallow undulations in the landscape where watercourses form in the shallow depressions. The site is located between 1 100 m and 1 200 m altitude rising from southwest to northeast. No watercourses occur within the proposed footprint of the PV plant. A larger watercourse, an ephemeral tributary of the Basterspute se Leegte River, is found to the east of the site however it is unlikely that the proposed PV plant will have any impact on this aquatic feature.

The underlying geology in the area consists of grey quartzite and subordinate quartz-sericite schist of the Uitdraai Formation, Quartzite and subordinate schist of the Kaboom and Spioenkop Formations. Loose sands and loamy soils overlay a bedrock of shale or calcrete. In general, the soils in the area are yellow or red freely drained, structureless soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils.

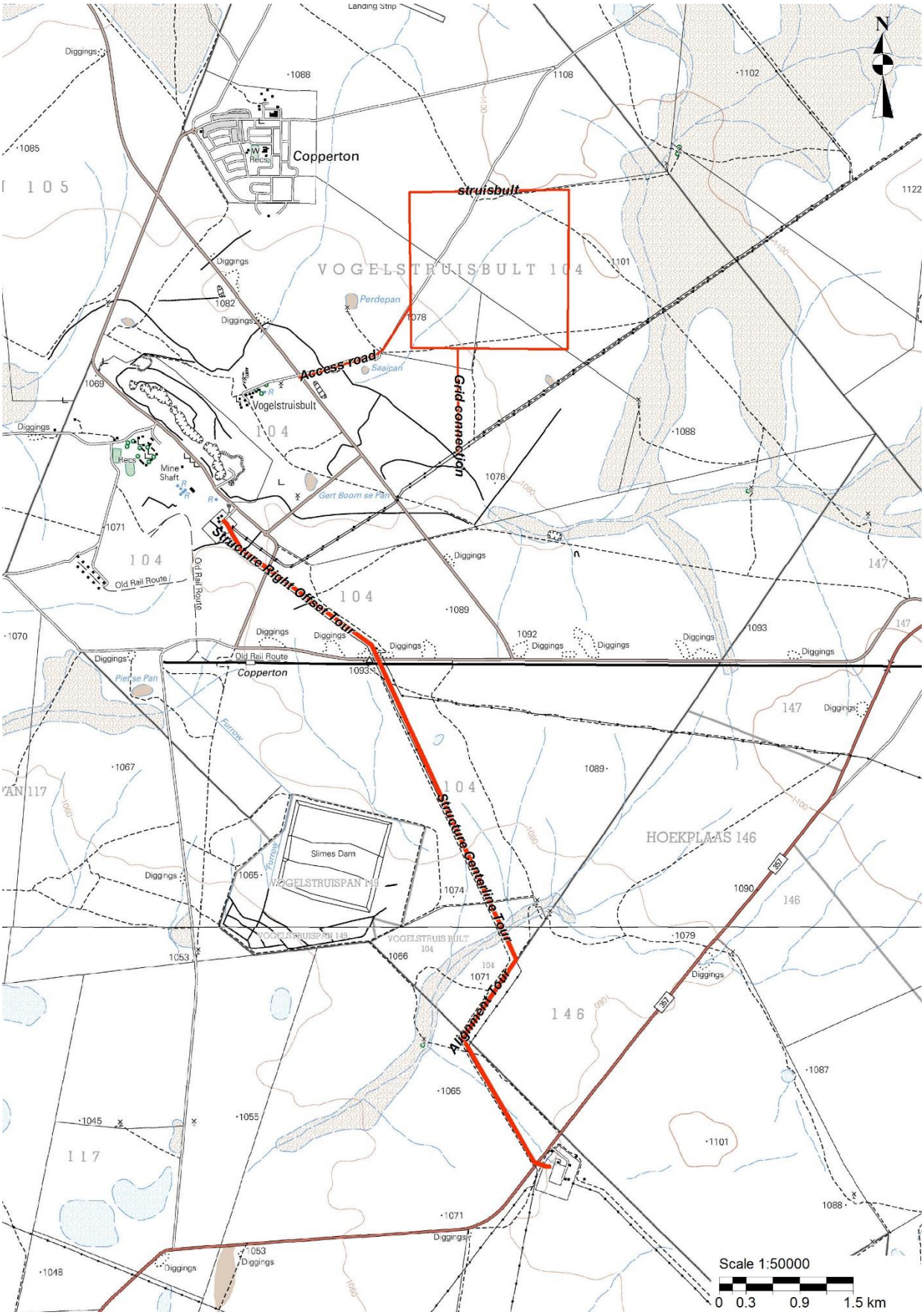


Figure 1. Topographical map for the area showing the location of the proposed works

Figure 2. Orthophotograph (2017) of the area, showing the location of the proposed works in relation to the mapped watercourses (blue areas are Freshwater Ecosystem Priority Area wetlands)

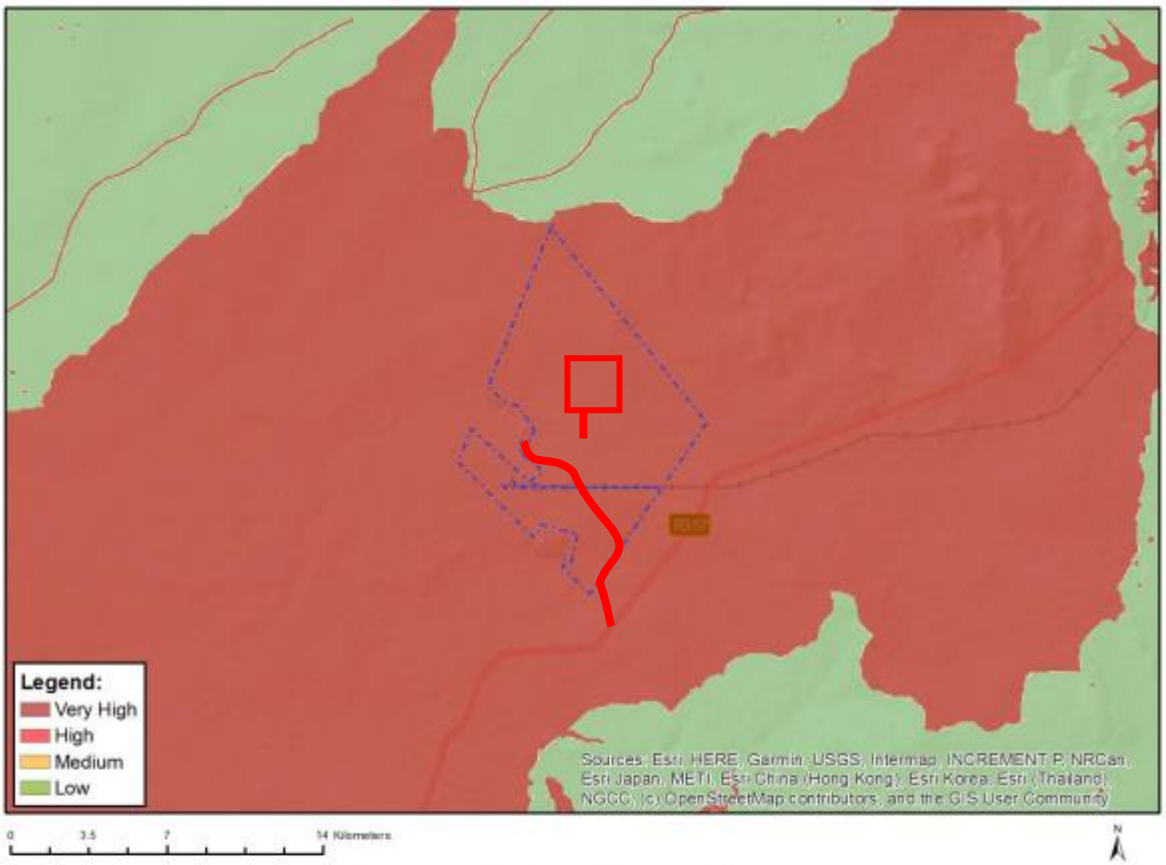
The weather at Pieska is classified according to the Koppen Climate Classification as "Bwh". (Tropical and Subtropical Desert Climate). This climate has a highly variable rainfall and extreme temperatures. The average annual rainfall is 269.2 mm. The month with the most rainfall on average is February (55.9 mm). July has the least rainfall (5.1 mm) on average. The average annual temperature is 18.8°C with the warmest month, on average, being January (26.6°C) and the coolest month June (10.2°C). There are on average about 43 rainfall days per annum. The mean annual runoff for the area is 2.4 mm.

Due to the climatic conditions of the area, the minor watercourses and the wetland areas that occur in the area are ephemeral (non-perennial), only containing water for short periods, immediately following local rainfall events. A dominant feature of the larger rivers in the wider area is the alluvial floodplains that are characterised by multiple channels that are interchangeably used during higher flow events. These sandy floodplains tend to have mostly bare beds, with vegetation occurring in clumps along the bed and more densely along the banks. The ephemeral watercourses in the area are highly dependent on groundwater discharge.

Also due to the climate and underlying geology/soils, the vegetation cover consists of open to sparse Bushmanland Arid Grassland of the Nama-Karoo Biome. The unpredictable and mostly autumn rainfall soon followed by winter frost events results in a short growing season, particularly in years of drought. Bushmanland Arid Grassland is compared to a semi-desert 'steppe', referring to the sparse vegetation dominated by white grasses interspersed with low shrubs (Figure 3). Typical species are *Rhigozum trichotomum*, *Stipagrostis spp*, *Eragrostis spp., Zygophyllum spp* and *Lycium spp.* Bushmanland Arid Grassland vegetation is classified as Least Threatened (Mucina et al., 2006).

Figure 3. View of the topography, soils and vegetation characteristic of the site

The DFFE Screening Tool indicates the project to be in a wider area indicated as being of very high Aquatic Biodiversity Combined Sensitivity (Figure 4). This is because the site is located in the catchment of the Basterspu se Leegte River which is mapped as an Upstream Management Area, a sub-catchment in which human activities need to be managed to prevent degradation of downstream Freshwater Ecosystem Priority Area (FEPAs) and Fish Support Areas.



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Rivers
Very High	Wetlands and Estuaries
Very High	Freshwater ecosystem priority area quinary catchments

Figure 4. The DFFE Screening Tool mapping for Aquatic Combined Sensitivity in the vicinity of the site

The larger watercourse corridor to the west of the PV site is mapped as an aquatic Critical Biodiversity Area (CBA)(Figure 5). The CBAs are considered to be in a natural condition and are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. These areas should be maintained in a natural or near-natural state or where

necessary rehabilitated. Only low-impact, biodiversity-sensitive land uses are considered appropriate. The proposed PV facility and associated infrastructure is unlikely to impact the aquatic biodiversity mapping. The LILO line ends at the outside edge of the watercourse corridor that is mapped as a CBA. The watercourse at this point is highly modified and degraded and largely non-existant with a road having been constructed to the south of the LILO and thus it is highly unlikely that the project would have any impact on the associated aquatic feature.

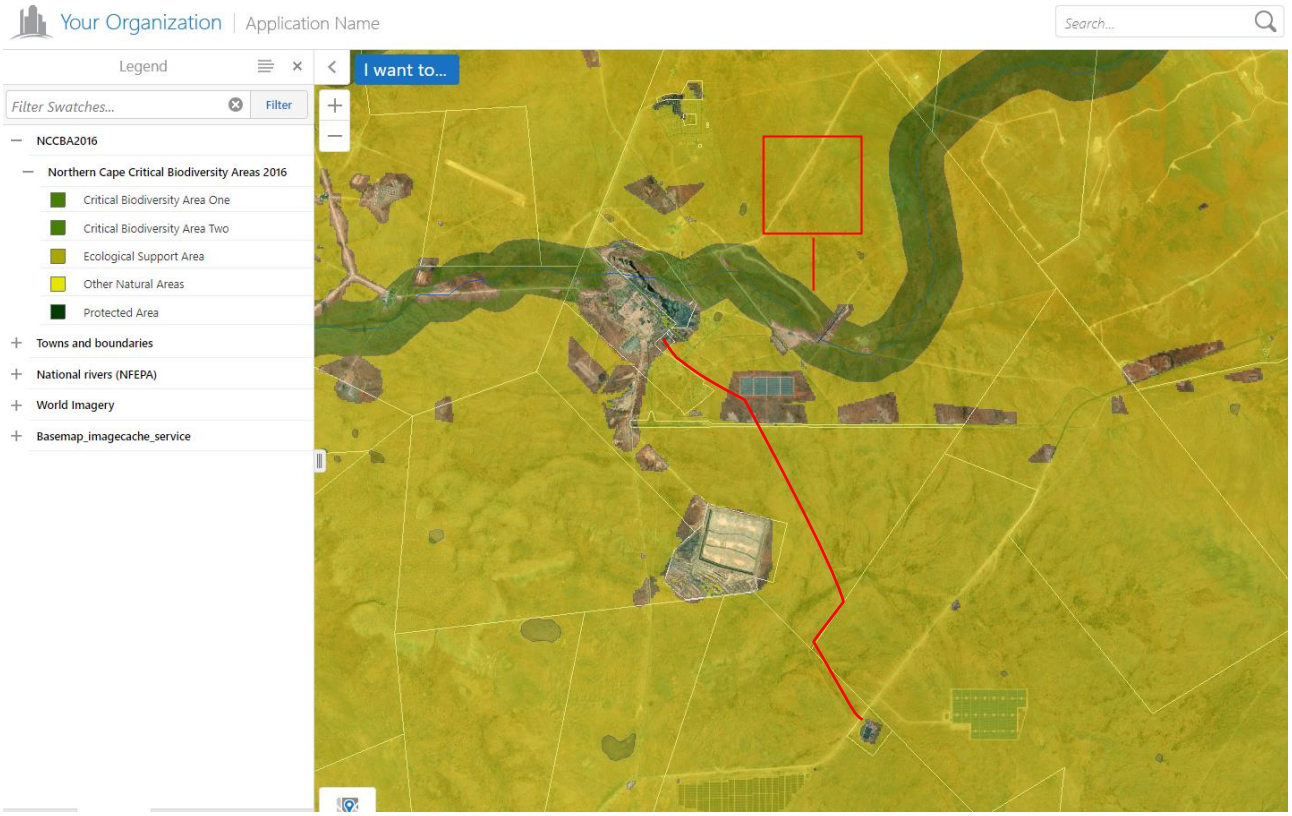


Figure 5. The Northern Cape Critical Biodiversity Areas mapping for the site and surrounding area (SANBI Biodiversity GIS, December 2021)

In terms of Freshwater Ecosystem Priority Area Wetlands and the National Wetland Map (Figure 6), there are several small depression wetlands in the surrounding area. There are also some wider river corridors mapped to the south-west of the PV facility, one of which is crossed by the proposed strengthening line between Cuprum and Kronos Substations. Given that: (1) the proposed OHPL will be constructed adjacent to an existing ESKOM servitude with no new access road required; and (2) the powerline can easily span the watercourse corridor; the likely impact of the powerline construction would be neglible. Any temporary roads through the watercourse during construction should only be used where absolutely necessary and the disturbed area rehabilitated afterwards.

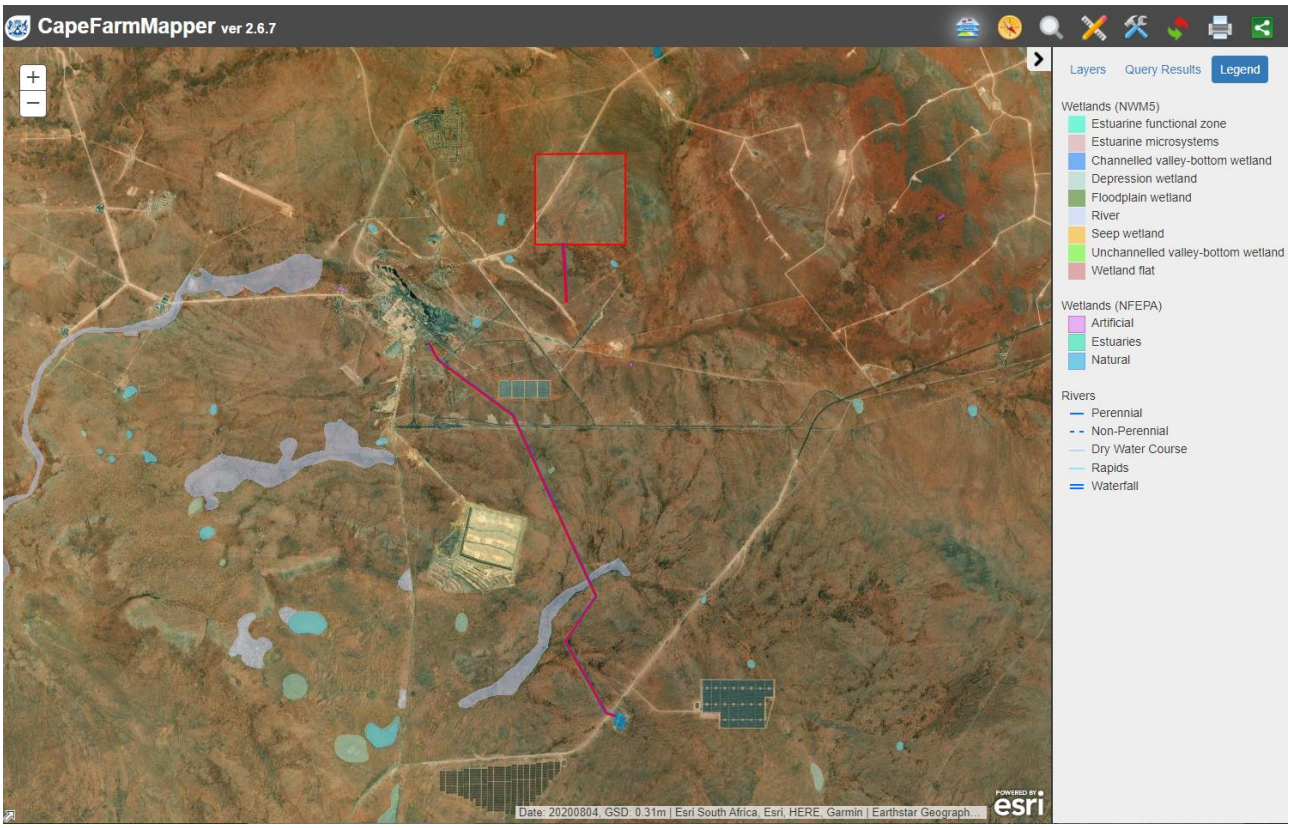


Figure 6. The Freshwater Ecosystem Priority Area Wetland and National Wetland mapping for the site and surrounding area (CapeFarmMapper, December 2021)

3. CONSIDERATION OF ANY AQUATIC CONSTRAINTS AT THE SITE

Based on the desktop assessment for the site, no aquatic features of any significance were indicated to occur at the site of the proposed PV facility. The LILO line ends at the outside edge of the watercourse corridor that is mapped as a CBA and is unlikely to impact on the associated aquatic feature. The strengthening line between Cuprum and Kronos Substations crosses a watercourse that has been included in the National Wetland Map 5 but as no new access road will be required and the powerline will span the watercourse corridor, it will also be unlikely to impact on any aquatic feature.

A site visit was conducted at the end of the rainy season on 26 and 27 July 2021 to verify the aquatic features occurring on the site. No watercourses of any significance were found to occur on the site. This assessment concurred with the findings of a previous botanical assessment of the site undertaken by Bergwind Botanical Surveys and Tours in February 2011 as well as an aquatic specialist assessment conducted by MacKenzie Ecological and Development Services in 2012. As mentioned above, the proposed powerlines associated with the project are unlikely to impact on any aquatic features in the area provided they remain outside of a 35m buffer from the watercourse. Figure 7 is a Google Earth image with the project components, mapped aquatic features and the recommended 35m buffer.

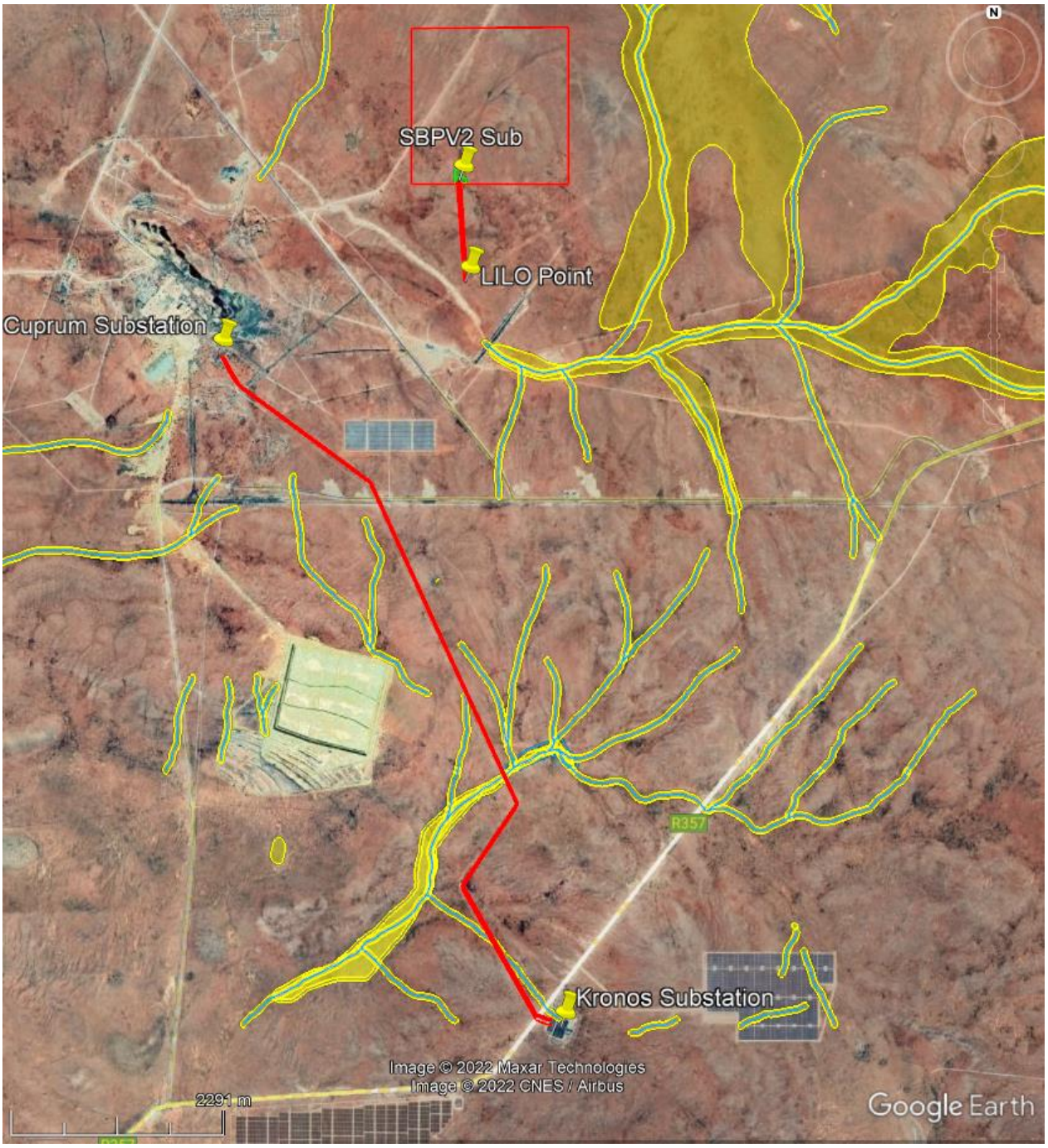


Figure 7. Google Earth image with the project components (red lines) mapped aquatic features (blue lines) and the recommended buffers (yellow lines)

4. RECOMMENDATIONS AND CONCLUSIONS

No watercourse or wetland habitats were found to occur within the proposed PV Facility site on Struisbult 104 Portion 1, near Copperton as well as the proposed LILO. While the proposed strengthening line between Cuprum and Kronos Substations crosses a watercourse, no new access road will be required and the powerline will span the watercourse corridor and the recommended 35m buffer such that it will also be unlikely to impact on any aquatic feature.

It can thus be said that the potential impact of the proposed project on any adjacent aquatic ecosystems, as well as the associated risk, for the construction and operation phases, is expected to be negligible. For this reason, no risk assessment and no water use activity in terms of Section 21 (c) and (i) water uses are considered to be applicable to the proposed activities.

5. REFERENCES

Bergwind Botanical Surveys and Tours. (2011). Botanical Assessment for a proposed solar energy plant at Struisbult 104 Portion 1 at Copperton, Northern Cape Province.

CapeFarmMapper. https://gis.elsenburg.com/apps/cfm/

Department of Water Affairs and Forestry. (2005). *River Ecoclassification: Manual for Ecostatus Determination (Version 1)*. Water Research Commission Report Number KV 168/05. Pretoria.

Department of Water and Sanitation. (2016). General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in Section 21(c) or Section 21(i). Government Gazette No 509 of 27 July 2016.

Driver, Nel, Snaddon, Murray, Roux, Hill. (2011). Implementation Manual for Freshwater Ecosystem Priority Areas. Draft Report for the Water Research Commission.

MacKenzie Ecological and Development Services. (2012). Aquatic Specialist input to the Basic Environmental Impact Assessment: Proposed Photovoltaic Energy Plant on Struisbult Farm near Copperton, Northern Cape.

SANBI Biodiversity GIS. http://bgis.sanbi.org

APPENDIX 1: SPECIALIST DETAILS, EXPERTISE AND DECLARATION

1.1. Background and Qualifications of Specialist Consultant

Contact details: 53 Dummer St, Somerset West, 7130

Names: Antonia Belcher
Profession: Aquatic Scientist (P. Sci. Nat. 400040/10)
Fields of Expertise: Specialist in freshwater assessments, monitoring and reporting
Years in Profession 30+ years

Toni Belcher worked for the Department of Water Affairs and Forestry for more than 17 years. During this period she worked for the Directorate Water Quality Management, the Institute for Water Quality Studies and the Western Cape Regional Office and has built up a wide skills base on water resource management and water resource quality for rivers, estuaries and the coastal marine environment. Since leaving the Department in 2007, she has been working in her private capacity and was co-owner of BlueScience (Pty) Ltd, working in the field of water resource management and has been involved in more than 500 aquatic ecosystem assessments for environmental impact assessment and water use authorisation purposes. In 2006 she was awarded a Woman in Water award for Environmental Education and was a runner up for the Woman in Water prize for Water Research.

Professional Qualifications:

1984 Matriculation Lawson Brown High School
1987 B.Sc. – Mathematics, Applied Mathematics University of Port Elizabeth
1989 B.Sc. (Hons) – Oceanography University of Port Elizabeth
1998 M.Sc. – Environmental Management (*cum laude*) Potchefstroom University

Key Skills:

Areas of specialisation: Aquatic ecosystem assessments, Monitoring and evaluation of water resources, Water resource legislation and authorisations, River classification and Resource Quality Objectives, River Reserve determination and implementation, Water Quality Assessments, Biomonitoring, River and Wetland Rehabilitation Plans, Catchment management, River maintenance management, Water education.

Summary of Experience:

1987 – 1988	Part-time field researcher, Department of Oceanography, University of Port Elizabeth
1989 – 1990	Mathematics tutor and administrator, Master Maths, Randburg and Braamfontein Colleges, Johannesburg
1991 – 1995	Water Pollution Control Officer, Water Quality Management, Department of Water Affairs, Pretoria
1995 – 1999	Hydrologist and Assistant Director, Institute for Water Quality Studies, Department of Water Affairs and Forestry, Pretoria
1999 – 2007	Assistant and Deputy Director, Water Resource Protection, Western Cape Regional Office, Department of Water Affairs, Cape Town
2007 – 2012	Self-employed
2013 – 2020	Senior Aquatic Specialist and part owner, BlueScience
2020 – present	Self employed

1.2. Declaration of Independence

I, Antonia Belcher, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
    - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
    - ~~am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);~~
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affectedparties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Signature of the Specialist:	
Name of Company:	-
Date:	14 December 2021