

# Scoping Archaeological Impact Assessment

**Proposed development of the Droërvier Solar Facility, on Portion 55 of Farm 168 Steenrotsfontein and a portion of Portion 10 of Farm 170 Weltevreden, Beaufort West, Western Cape Province**

prepared for

**Cape Environmental Assessment Practitioners (Cape EAPrac)**, PO Box 2070, George, 6530, Tel: 044 874 0365, Fax: 044 874 0432 and **PERCEPTION Planning**, P.O. Box 9995, George, 6530, Cell: 082 568 4719, E-mail: perceptionenvplg@gmail.com, on behalf of **The Applicant: Droërvier Solar Power Plant (Pty) Ltd.**

by



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15 September 2014

## **Name, Expertise and Declaration**

I, **Peter Nilssen** (PhD in archaeology, UCT 2000), herewith confirm that I am a Professional member - in good standing - of the Association of South African Professional Archaeologists (ASAPA), including the Cultural Resource Management section of the same association.

As the appointed independent specialist (archaeologist) for this project hereby declare that I:

- act as an independent specialist in this application;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct;
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant, EAP and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2010 (specifically in terms of regulation 17 of GN No. R. 543) and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- am aware that a false declaration is an offence in terms of regulation 71 of GN No. R. 543.



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Signature of the specialist:

Date: **15 September 2014**

## Introduction

The Applicant proposes to develop a Photovoltaic (PV) solar facility with a maximum generation capacity of 75MW (megawatts) AC (Alternating Current). The facility will consist of fixed tilt, single- or double- axis tracking PV panel arrays, covering an approximate area of 250ha, which will convert solar energy from the sun (Direct-Current DC = >90MW) into electricity (Alternating-Current AC = 75MW) to be fed into the national Eskom grid, at the nearby existing Droërvier Substation.

Associated infrastructure will include the following:

- An overhead 132kV transmission line of approx. 3km in length, which will align parallel to one of the two existing transmission lines already crossing the study site, to link the facility to the nearby Eskom Droërvier Substation north of the Gamka River;
- An on-site Switching / Sub-station;
- Auxiliary Buildings (Control Centre, Administration offices, Security etc.);
- A network of Inverters, Transformers & Underground Cabling;
- Access road off the N12 & internal road network to and around the Photovoltaic panels;
- Perimeter security fencing; and
- Rainwater tanks.

The suitability, final layout and specifications of the proposed activity and its associated infrastructure will be determined by the outcome of specialist studies and public participation to be undertaken as part of the legally required Scoping & Environmental Impact Reporting (S&EIR) process in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). The S&EIR process is being facilitated by Cape Environmental Assessment Practitioners (Cape EAPrac, see contact details on cover page of this report).

Development activities related to the proposed Droërvier Solar Facility trigger the National Heritage Resources Act (Act 25 of 1999), and therefore, this author was appointed to provide archaeological input for the broader integrated Heritage Impact Assessment that is being undertaken by Perception Planning in terms of Section 38(8) of the National Heritage Resources Act.

The current phase of the process involves a Scoping Archaeological Impact Assessment (SAIA) of the affected environment. Because the proposed development activities - construction and installation - may have a permanent negative impact on archaeological resources in the development footprint, this SAIA serves to assess the likelihood of such resources occurring on the site and provides a strategy for further assessment. To this end, this report gives a basic description of the archaeological record in the surrounding environment, and outlines the methodology to be employed during the full Archaeological Impact Assessment (AIA).

## Study Area

The proposed development site for the Droërvier Solar Facility is on Portion 55 of Farm 168 Steenrotsfontein and a portion of Portion 10 of Farm 170 Weltevreden, Beaufort West, Western Cape Province (Figures 1, 2 & 3). The proposed site for the solar panel arrays is situated some 7km south-west of Beaufort West and borders on the N12 highway while the Droërvier Substation lies approximately 3km to the north of the proposed solar

facility (Figures 2 & 3). The current land zoning is Agriculture 1 and the property is used for cattle and game grazing. The following relatively recent human-related disturbances to the property were noted. A disused borrow pit and other small-scale excavation occur near the south-eastern corner of the study area. Several single vehicle gravel tracks traverse the area and apart from boundary fences around the proposed solar facility site, no internal fences were seen. A few fence lines lie between the solar facility and the Droërvier Substation. A dam containing water tanks and a few troughs are located at the southern boundary fence, roughly in the middle of the property. Two north-south aligned overhead transmission lines run across the property. The larger of the two (with steel pylons) runs roughly through the middle of the study area while the smaller one (with wooden pylons) is close to the N12. A few small and larger mammal burrows occur, but these are not common in the study area.

While small and low ridges or koppies as well as rock outcrops occur in the study area, the overall topography is flat to gently undulating with drainage lines, and the general landscape, sloping down to the Gamka River some 300m north of the study area. Except for Acacia thickets and denser grasses in and immediately adjacent to the watercourses (Gamka River and Droërvier), the landscape is open with typically sparse, low and open Karoo vegetation. As a result, archaeological visibility is excellent. Surface sediments consisting of angular to sub-angular gravels is most common while soft surface sediments of silty sands and finer gravels are less common.

## **Brief Overview of Previous Studies**

The Karoo houses a long and rich archaeological record dating from the earliest stages of Stone Age technology that are over a million years old, to the historic period that consists of the last few hundred years of human occupation (see Nilssen 2011 and references therein). Archaeological sites include caves and rock shelters, open air artefact scatters, rock engravings and historic structures with their associated cultural materials. No previous archaeological or heritage related work has been done on the affected properties for the proposed Droërvier Solar Facility and no significant heritage sites occur in the immediate vicinity of the site.

This author conducted an archaeological study for a proposed solar facility some 15km north-east of the present study area, and results from that study is a good indicator of the type of archaeological record we can expect at the proposed site for the Droërvier Solar Facility. The main finds of the latter study include numerous isolated and very low density scatters of Stone Age implements ranging in age from the Early through Middle to the Later Stone Age (ESA, MSA and LSA). Due to their temporally mixed nature and the absence of other faunal or cultural remains, these finds were considered to be of low significance. Nevertheless, several archaeological occurrences representing isolated events of stone tool manufacture were recorded and these were considered to be of medium to high significance. Recommendations were made for their protection and conservation (Nilssen 2011).

It is probable that similar archaeological materials occur within the present study area, and therefore, it is likely that a full Archaeological Impact Assessment (AIA) will be required by Heritage Western Cape (HWC).

## **Potential Impacts on Archaeological Resources**

Because tangible heritage resources are non-renewable and each archaeological occurrence is unique, it is important that areas affected by development are assessed for the

presence and sensitivity of such resources prior to development. The Droërvier Solar Facility will involve both area and linear developments that could have a permanent negative impact on archaeological resources if they were to occur in the area. This scoping study has shown that archaeological resources do occur in the surrounding environment and are therefore likely to occur on the properties in question. The purpose of the broader EIA process is to assess the sensitivity of environmental resources in the affected area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures. The future AIA will serve the same purpose concerning archaeological resources.

Because the planning and design phase of the development will be informed by the AIA and broader EIA process, any direct negative impacts on significant archaeological and environmental resources can be avoided or minimized by altering the design and layout plans accordingly. A construction phase Environmental Management Plan (EMP) will further avoid or minimize direct negative impacts.

Potential direct negative impacts on archaeological and tangible heritage resources will occur during the construction and installation phase of the proposed development. Indirect and cumulative impacts may occur during the operational phase, but these can be avoided or minimized by means of an EMP that should be implemented during the operational phase of the development.

Based on results from previous heritage impact studies in the surrounding environment, including this author's work conducted a few kilometres to the north-east, it is possible that significant archaeological materials will be identified through the AIA, and therefore, a detailed ground truthing study is needed.

## **Proposed Methodology for the Archaeological Impact Assessment**

The purpose of an AIA is to conduct a survey of the affected area to identify, record and rate the significance of archaeological resources, to assess the impact of the proposed area and linear development on such resources and to recommend mitigation measures where necessary.

To assess the nature and significance of the archaeological record in the affected area, it is necessary to conduct a comprehensive foot survey. Initially, the latter will focus on the provisional development layout plan including the footprint area for the solar panels and corridors for the overhead power line route (Figure 3). The aim is to determine the archaeological sensitivity of these areas and their suitability for the proposed development.

Open vegetation and large expanses of exposed ground surfaces provide excellent archaeological visibility and will allow for a good understanding of the archaeological record in the area based on surface observations and those of exposed sedimentary profiles in erosion gullies and water courses. Due to good archaeological visibility, survey walk tracks will be spaced some 50 to 80m apart and will be fixed with a hand held GPS to record the search area. The position of archaeological occurrences, observations and photo localities will also be fixed by GPS. Digital audio notes of observations will be kept and a comprehensive, high quality digital photographic record will be made.

The potential for different landforms, sediments or landscape features to contain archaeological traces is assessed according to type, such as rocky surfaces, sandy surfaces, cultivated areas, previously developed or disturbed areas, rock shelters, and so on. Overall, the significance of archaeological occurrences or sites will be evaluated in terms of their

content and context. Attributes to be considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, aesthetic appeal, potential for future research, density of finds and the context in which archaeological traces occur.

Once archaeological traces have been identified, recorded and assessed in terms of their significance, the aim of the AIA is to assess the potential negative impacts of development on such resources and to make recommendations in mitigation. In the event of finding highly significant sites, it may be required to alter the development layout plans in order to avoid such sites, and so that they can be protected and conserved in perpetuity. In other cases it may be sufficient to record and/or retrieve samples from archaeological occurrences with a permit from HWC. In the event that an archaeological site, after being recorded and/or sampled, will be disturbed, damaged, or destroyed by development activities, then a destruction permit must be obtained from HWC. Having said this, it is anticipated that the archaeological record in the affected area will mostly be of low significance and that these measures will not be required. It is possible that isolated stone tool manufacture sites, such as those mentioned above, may be encountered and these can be protected and conserved through measures developed in an Archaeological Conservation Management Plan.

The end product of the AIA is a report that forms part of the Integrated Heritage Impact Assessment and that meets standards required by the HWC in terms of the National Heritage Resources Act, No. 25 of 1999. The AIA report will provide results from a detailed foot survey, and will assess potential negative impacts associated with the proposed development and make recommendations in mitigation where necessary.

## **Reference**

Nilssen, P. 2011. Archaeological Impact Assessment. Proposed Beaufort West Photovoltaic (Solar) Park: southern portion of properties; 2/158 Lemoenkloof, RE 9/161 Kuilspoort, RE 162 Suid-lemoensfontein and RE 1/163 Bulskop, Beaufort West, Western Province

**Figures** (on following pages)



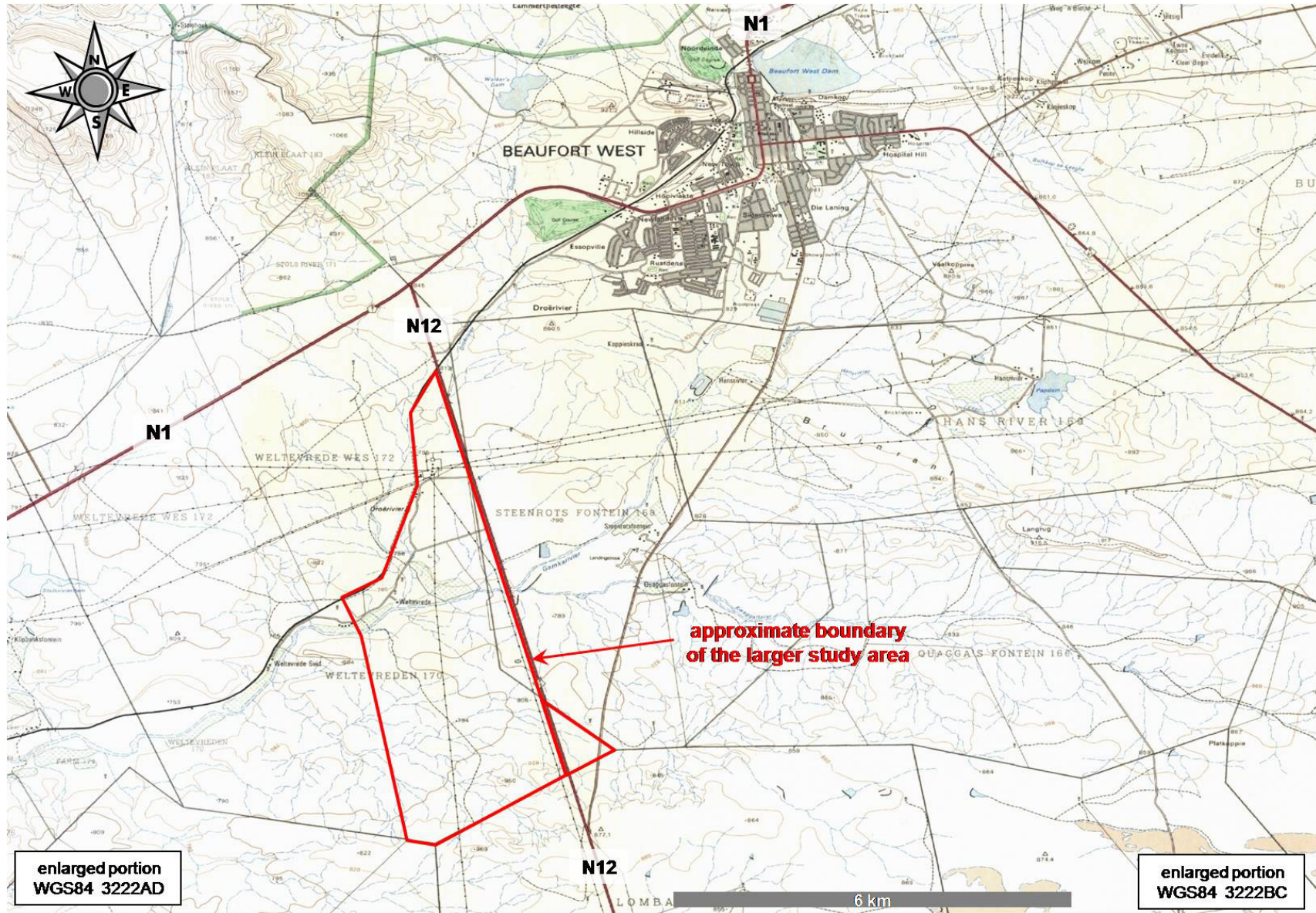


Figure 1. Location of larger study area (red polygon) relative to Beaufort West, Western Cape Province. (courtesy of The Chief Directorate, Surveys & Mapping, Mowbray).



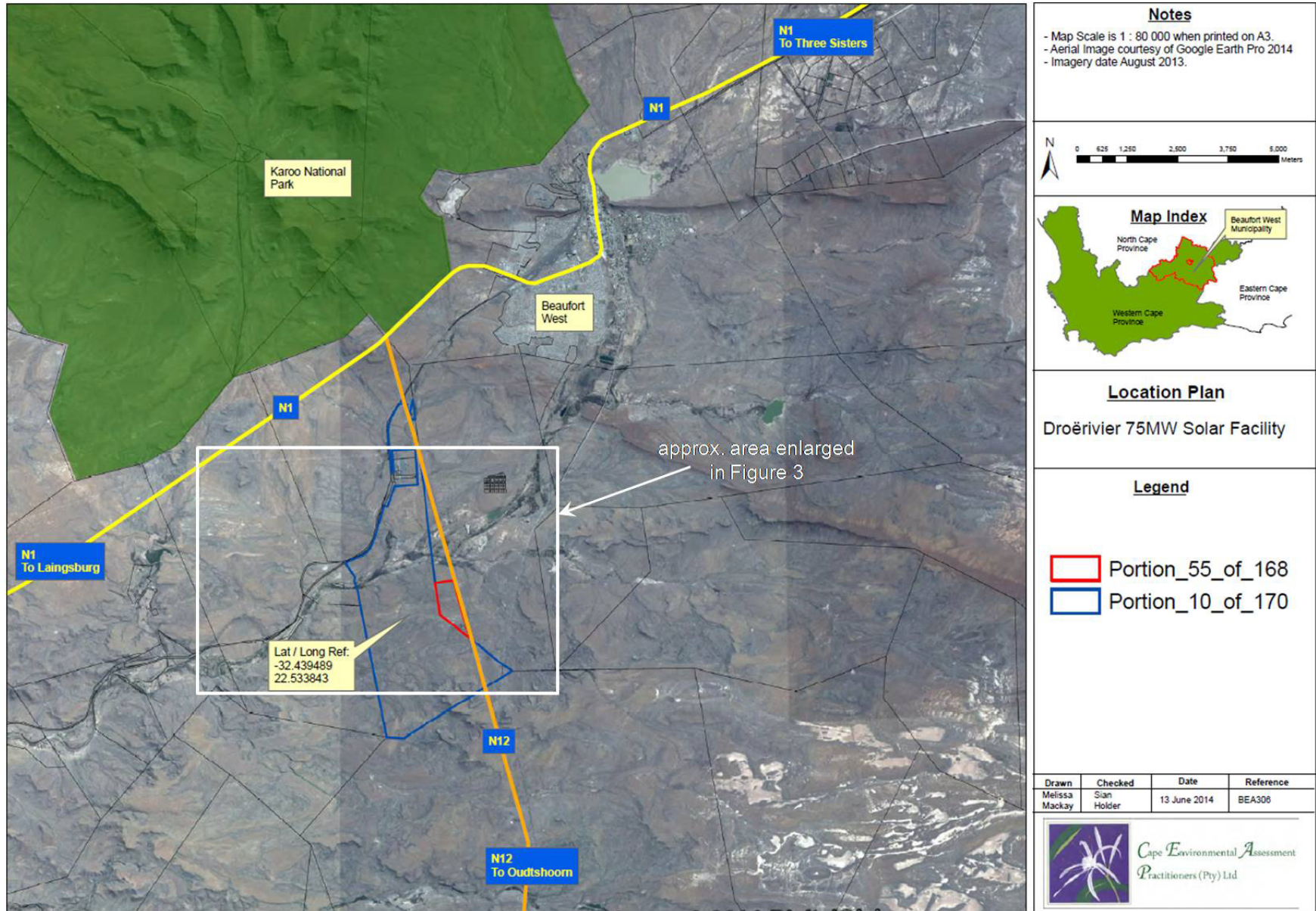


Figure 2. Location of affected properties (blue & red polygons) relative to Beaufort West, Western Cape Province (courtesy of Cape EAPrac).



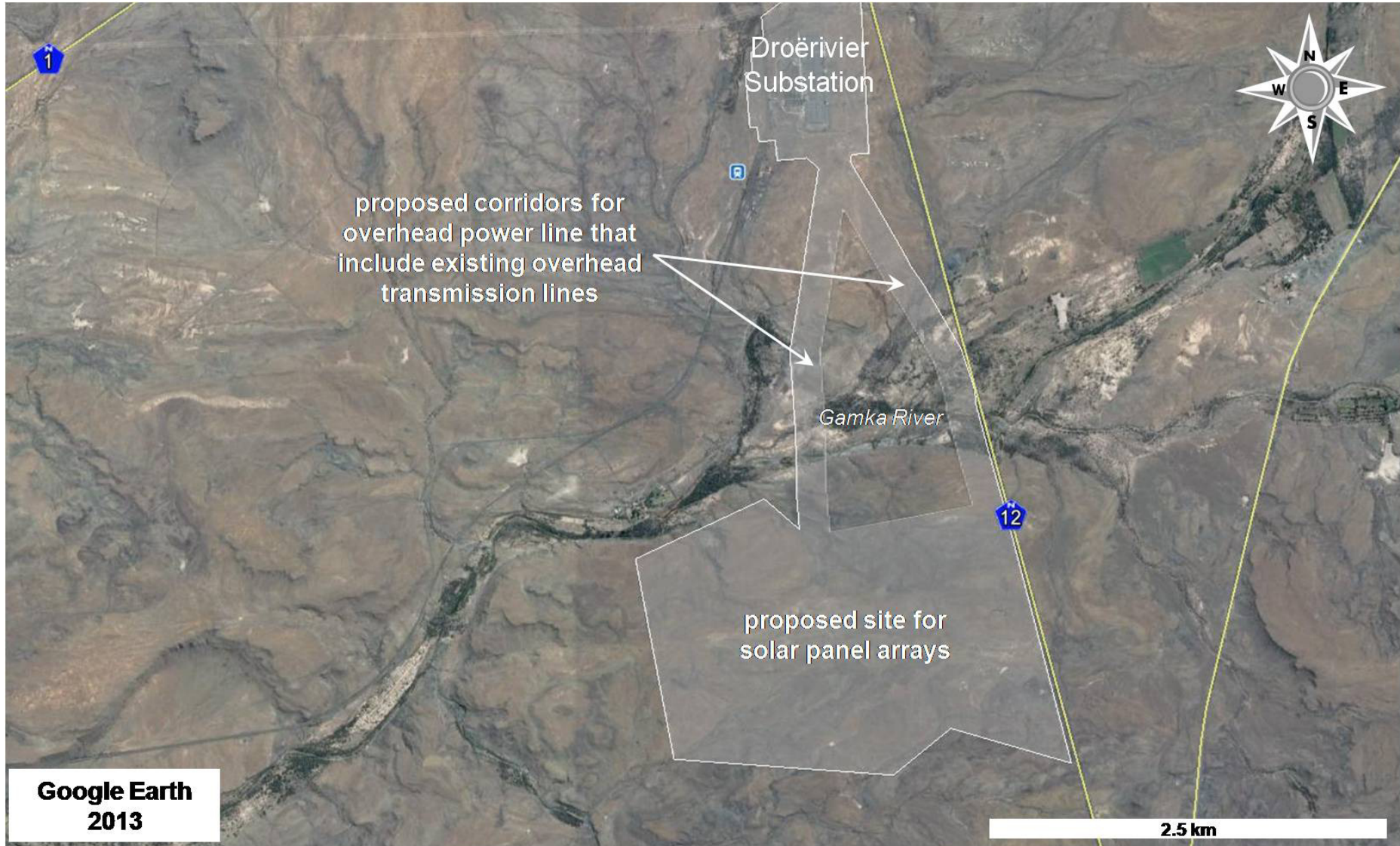


Figure 2. Provisional development layout on affected properties including the proposed area for solar panels and corridors for overhead power lines that include existing power lines (courtesy of Cape EAPrac).