DRAFT

BASIC ASSESSMENT REPORT

CES

ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

SANSA BASIC ASSESSMENT MATJIESFONTEIN

DRAFT BASIC ASSESSMENT REPORT

Prepared for:

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EXECUTIVE SUMMARY

Introduction

The South African National Space Agency (SANSA) intends to develop a space observation facility at two sites approximately 4km west of the town of Matjiesfontein in the Laingsburg Local Municipality, Central Karoo District Municipality, Western Cape. The proposed project will involve the construction and operation of radio antennae for tracking satellites in orbit. These antennas will range between 2.4m and 45m in height.

The proposed scientific instruments and antennas which are for deep space communication, will fulfil the roles of satellite navigation as they track satellites in orbit. This forms an integral part of space science and exploration as information and data will be collected to conduct in-depth research into the surrounding environment and in outer space.

The facility proposed at Matjiesfontein will provide crucial space science data to meet national and international obligations, raise the standard of South African research, and improve our understanding of the Earth's middle and upper atmosphere while also generating an income for the South African economy.

Suitability of the Matjiesfontein Site

CES has been appointed by SANSA as an independent Environmental Assessment Practitioner (EAP) to undertake a Basic Assessment (BA) and apply for the necessary Environmental Authorisation (EA). This report documents the process and findings of the Basic Assessment for the proposed SANSA Radio Antennae Project with specialist assessment information from an ecologist, heritage practitioner, archaeologist and palaeontologist. This report will be subject to a public comment period after which it will be finalised and submitted to the competent authority for review and decision-making purposes.

Site feasibility studies were undertaken by SANSA to select the most appropriate areas for the proposed development as well as the analysis of the weather conditions between 2003 to 2017.

The project site proposed for the development of the radio antennas displays characteristics which make it suitable for space exploration, including a sparse population and lack of development in the area surrounding the proposed site (200kms to the nearest city). It is also an environment with low to no interference on radio frequencies. The climate in the area is semi-arid and receives less than 100ml of rainfall in a year which eliminates the risk of rain fade which can impair signal transmission and reception and cause temporary degradation in radio frequency communications.

Location and Description

Two areas within portion 8 of Farm 148 Koenie Kraal have been selected for the development and will be referred to as Site A, alternative 2 and Site B (Figure 1 below).

An alternative site (Site A, alternative 1) was previously assessed for the proposed location of Site A, but was found to be unsuitable due to the high visual intrusion it was anticipated to

have on the Provincial Heritage Site of Matjiesfontein Village. As such, and based on the recommendations of the heritage report, SANSA found an alternative site (Site A, Alternative 2) further away from Matjiesfontein where topographical buffers such as koppies limit the impact of the development of the scenic qualities of the Matjiesfontein Valley (Figure 1 Below).

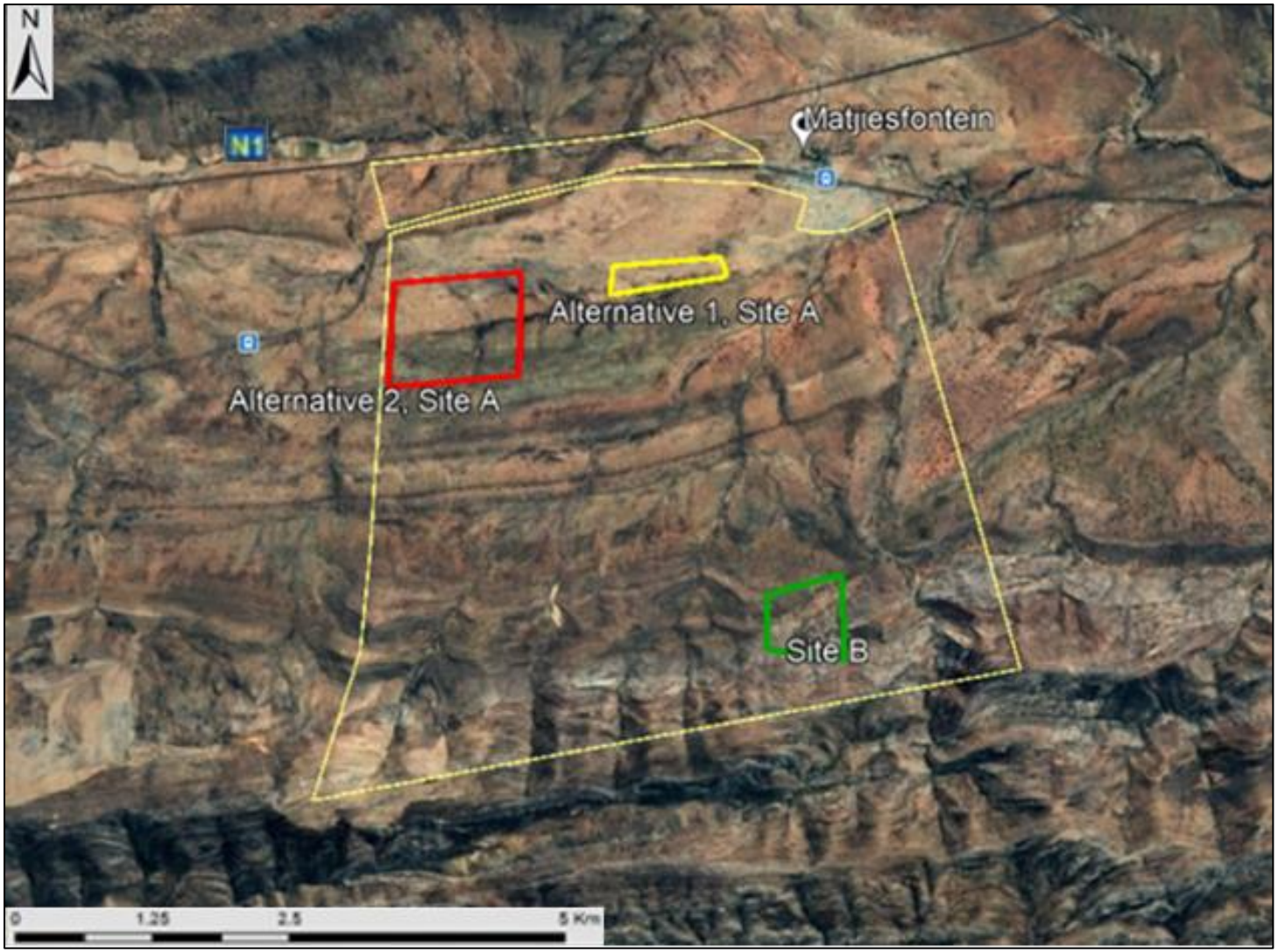


Figure 1: Alternative 1, Site A in relation to preferred Alternative 2, Site A and Site B within Portion 8 of Farm 8 (Koenie Kraal)

Site A Infrastructure

The infrastructure within Site A will consist of 4, large Deep Space Navigation **(DSN 1-4)** antennae which will not exceed 45m in height. Each of these are anticipated to have a physical footprint of 360m² as well as 3 smaller planned radio antennae up to 12m in height **(SANSA 1,2,3)** . Each of these antennae are expected to have a physical footprint of 100m². There will also be an 18 m Ka Band antenna **(LGS 18**) which will be up to 30m in height and have a footprint of 400m² (20mX20m).

Other associated infrastructure will consist of a guard house at the site entrance, signal processing building which will house the signal processor room, operations and control room, lobby, reception, kitchen and ablution facility and is anticipated to have a physical footprint of 525m², with an accompanying 900m² curbed, gravel parking area.

Alongside the main building will be a 70 000l water storage tank as part of a fire management system and a conservancy tank for temporary wastewater and sewerage storage which will be serviced regularly by a licenced waste hauling company.

On the western edge of the site, a power station is planned which will be of similar size to the main building on the eastern edge. The power station will consist of the stores, workshop, generators and fuel storage and will also have an accompanying 900m², curbed parking area. An overhead powerline (not exceeding 22kv), 750m in length is planned to connect the power station to the existing Eskom substation outside the site.

The generators will be installed in phases as the site expands. The first generator of four will be 1200 KVA and be housed in the generator room. Total capacity will eventually be 4800KVA.

Electricity will be distributed within the site through underground cables from the power station to the antennas and buildings, these will be at a depth of 1m with a 200mm covering of river sand, a layer of danger tape and backfilled with the original soil.

The diesel storage at the power station has a combined storage capacity of 280 000lt. This will be stored above ground in self-bunded, moveable systems. Each bunded tank holds 70 000lt and will be connected to one another as the site grows and the power capacity needed increases.

Water will be sourced from a municipal water point approximately 2km from the site and will need connection via a 50mm pvc underground pipe. SANSA also intends on drilling a borehole to supplement water provisions.

New access roads will need to be constructed within the site and are anticipated to be 4m wide, graded and compacted with overlain gravel.

PVC ducting will be lain to connect the fibre to the control room and to each antennae. This will be lain at 600mm below ground surface, consisting of 4x100mm PVC pipes with a PVC manhole at 50m intervals for maintenance.

The entire site will be fenced, with either diamond mesh with flatwrap on top or clearvu fencing.

All construction spoil, including excavation and clearing will be taken to the Majiesfontein solid waste disposal site.

Site B Infrastructure

Site B will house 2 scientific instruments known as short/long laser rangers (S/LLR), each with a footprint of 14.2m² (the size of a Shipping container) and an administration booth with a footprint of 9m² (3mX3m). Solar panels will form part of the roofing of the infrastructure in order to supply power to the equipment. The scientific instruments will each be individually fenced by a standard 3m high, 10m x10 diamond mesh fence with flat wrap at the top. The existing access roads to this site will remain unchanged, however new internal gravel roads, 4m wide, will be needed to access the infrastructure

Expected triggered Activities

Table1: Listed activities potentially triggered by the proposed construction of radio antennae.

Activity Number	Activity	Project component triggering activity
Listing Notice 1 (GNR 327)		
12	The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres or more; (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The combined physical footprint of the development is approximately 33 738m² and some infrastructure, such as the fencing, will be located within 32m of a watercourse.
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The proponent intends on storing 4 self-bunded containers of diesel, each with a capacity of 70 000l. Total 280 cubic metres
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation,	Including new roads 3.37 ha is anticipated for clearing
Listing Notice 3 (GNR 324)		
3	The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) Is to be placed on a site not previously used for this purpose; and (b) Will exceed 15 metres in height (i) Western Cape (i) All areas outside urban areas	The radio antenna will be up to 45m in height and located on a greenfields site.

Activity Number	Activity	Project component triggering activity
4	The development of a road wider than 4 metres with a reserve less than 13,5 meters (i) Western Cape (ii) Areas outside urban areas; (aa) Areas containing indigenous vegetation	New gravel roads are to be developed and existing roads are to be upgraded, they will be 4m in width. Compacted and covered in a layer of gravel
10	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. i. Western Cape ii. All areas outside urban areas;	The proposed development is outside the urban area
18 (i)	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. (i) All areas outside urban areas (aa) Areas containing indigenous vegetation;	Existing roads will be upgraded and lengthened by 5,548km

Description of the site

Matjiesfontein, near Laingsburg in the Klein Karoo, has a semi-arid desert climate, with approximately 185mm of annual rainfall. During the hottest months (November to March), the average temperature ranges between 15˚C and 30˚C and in the winter months (May to August) the average temperature is between 1˚C and 16˚C. The mean annual temperature in Matjiesfontein is 15.4 °C.

Approximately 3km from Matjiesfontein, behind a ridge averaging 40m in height (from ground level) and located within the margins of the Cape Fold Belt on the northern side of the Witberg Range, is Site B. The area is something of an enclosed valley and fairly level, ascending to the south.

On the northern side, closest to the N1 and approximately 3km from Matjiesfontein village, is Site A. This area is characterised by undulating hills or “koppies” and rocky outcrops. There is a slope which descends towards the river bed that transects the site. The elevation ranges from 969m down to 954m when moving from north to south towards the river and then up to 965 on the southern side of the river.

The underlying bedrock comprises of dark grey Permian glacial tillites of the Dwyka Group formation. The predominant geology of the area is characterised by dry, sandy soils and

gravelly alluvial sediments. There are several irregular quartzite bodies with associated sandstone and shale as well as Dwyka tillite outcrops.

Drainage in the area includes drainage lines with relatively gentle slopes and narrow streams at the bottom as well as gently sloping river beds where river washed gravel has accumulated. These perennial systems will only have water for a few months of the year during the wet season (May- August).

The vegetation present at Site A/Alternative 2 is characteristic of Koedoesberge-Moordenaars Karoo and is characterised by short shrubs of up to 1m interspersed with *Aristida diffusa* (grass species), herbs and succulents.

The site located further up the slope (site B) was characteristic of Matjiesfontein Shale Renosterveld as it was dominated by *Elytropappus rhinocerotis* (Renosterbos) and *Aristida diffusa* and not by fynbos species typical of Matjiesfontein Quartzite Fynbos, which was the vegetation type expected to be on site based on the National Vegetation map. Although there was overlap with species at site A/Alternative 2, this site had fewer succulent species.

Both vegetation types were typically intact and in good condition with little evidence of disturbance or invasion by alien species. Eight species of conservation concern were recorded within the study area and no alien invasive plant species were recorded at either of the sites.

Both sites fall within an *Ecological Support Area 1* (drainage lines) and *Other Natural Area* (the rest of the site). Based on the specialist report, the drainage lines are classified as areas of high sensitivity due to the ecological processes these systems provide while the remaining vegetation (Koedoesberge-Moordenaars Karoo and Matjiesfontein Shale Renosterveld) is classified as an area of moderate sensitivity due to it being intact, but widely distributed with a conservation status of Least Threatened.

In terms of archaeology, low densities of artefacts graded as having low, local significance were found at Site A/alternative 2 while no archaeological finds were made at Site B.

The unconsolidated gravelly to sandy superficial deposits overlying the Palaeozoic bedrocks at Site A/alternative 2 are, at most, very sparsely fossiliferous and no fossils were recorded from these younger sediments during the field survey.

No fossils were recorded at Site B, most of which is covered by a thick (1 m or more) blanket of coarse, rubbly and partially-ferruginised quartzitic gravels and sands of both colluvial and alluvial origin which are generally of low palaeontological sensitivity.

Socio-Economic Profile of the Site

The village of Matjiesfontein is located approximately 240 km from Cape Town, in the Klein Karoo and covers an area of only 1.22km². The main economic sectors in Matjiesfontein include agriculture and tourism/retail, however the town has been described as economically static.

According to the census data (2011) the total population of Matjiesfontein is approximately 422 people who live in informal and formal settlement areas in 95 households. Of the 422

people in Matjiesfontein, 199 are under poverty, meaning that their annual income is less than R38 200. This equates to 55 of the 95 households and is 57,90% of the population (RDP, 2015)The Gender profile of Matjiesfonein shows an almost equal percentage of both genders with males being 46.45% and females being 53.55%.Learner enrolment in the Laingsburg Municipality increased slightly by 2.2 per cent between 2014 and 2016, from 1 220 to 1 247 learners. In 2016 the matric pass rate increased significantly to 90.3 per cent in Laingsburg, though there was a Gr 12 Drop-out Rate of 72.3% (Laingsburg Sep, 2017).

Site sensitivities

Areas of high sensitivity include all drainage lines and ecological support areas, both of which overlap with each other. Other than fences and some road crossings, SANSA have purposefully located the infrastructure outside of these sensitive areas to minimise their impact.

The remaining areas are of moderate sensitivity from an ecological perspective. Although they are intact and there are some SCC present, the vegetation types are listed as Least Threatened and are widespread.

In order to mitigate the impacts to the heritage resource which is the PHS of Matjiesfontein, an alternative for Site A was identified and located between 3km and 5km away from the historic core of Matjiesfontein Provincial Heritage Site and is placed sensitively behind topographical buffers such as koppies to limit negative impact to the scenic qualities of the Matjiesfontein Valley. Site A, Alternative 2, is further west on the same farm as the Alternative 1 (site previously assessed) which, according to the cultural landscape assessment conducted for this project, the proposed development was anticipated to have a high impact on the landscape causing noticeable change to the visual environment. The development had high visual exposure; low visual absorption capacity and low compatibility For these reasons, Site A, Alternative 2 was chosen as the preferred alternative with regards to heritage resources as its proposed location was chosen taking local landform into consideration, is less visible from the N1 and other significant cultural sites and is screened from these by local landforms. Site B has marginal visibility and is almost entirely screened by the natural enclosed valley which is the site. Although the Zone of Visual Influence has not been determined for Site A, Alternative 2. As such, this alternative complies with the recommendations of the Visual and Cultural Landscape Assessment (Eitzen, 2020). And the overall visual impact of the proposed development at Site A, Alternative 2 is therefore considered to be moderate.

From an archaeological and palaeontological perspective, the sites are considered to be of low sensitivity.

Impacts

It is anticipated that there will be seven high, seventeen moderate and five low impacts associated with the construction and operation of satellite antennae at the two proposed sites (Site A, alternative 1 and Site B) (Table 2). However, with mitigation measures and if the preferred alternative is selected (Site A, alternative 2) these can be reduced to seven moderate and nineteen low impacts. Three of the high impacts seen in the table below relate to Site A, alternative 1 which is not the preferred alternative.

Table 21: Summary of Impacts pre and post mitigation

Impacts	Without mitigation	With mitigation	No-Go Alternative
CONSTRUCTION PHASE			
LOSS OF NATURAL VEGETATION	MODERATE-	MODERATE-	N/A
LOSS OF SPECIES OF CONSERVATION CONCERN (FLORA)	MODERATE-	LOW-	N/A
LOSS OF EXTENT OF FAUNAL HABITAT FOR SPECIES OF CONSERVATION CONCERN (FAUNA)	MODERATE-	LOW-	N/A
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS/HABITAT FRAGMENTATION	MODERATE-	MODERATE-	N/A
EFFECTS OF DRAINAGE LINES AND RIPARIAN HABITAT DUE TO ROAD CROSSINGS	MODERATE-	LOW-	N/A
DISTURBANCE OF AQUATIC VEGETATION AND HABITAT	MODERATE-	LOW-	N/A
SOIL COMPACTION AND EROSION	MODERATE-	LOW-	LOW-
SOLID WASTE GENERATION	MODERATE-	LOW-	LOW-
CONTAMINATION OF WATER FROM CONSTRUCTION ACTIVITIES	HIGH-	LOW-	N/A
SITE CONTAMINATION DUE TO HAZARDOUS SUBSTANCES	MODERATE-	LOW-	N/A
ON SITE FIRE RISKS	MODERATE-	MODERATE-	
AIR POLLUTION	MODERATE-	LOW-	N/A
INCREASE IN NOISE LEVELS			
Alternative 1	HIGH-	MODERATE-	N/A
Alternative 2 and Site B	MODERATE-	LOW-	N/A
VISUAL IMPACTS			
Alternative 1	HIGH-	HIGH-	N/A
Alternative 2	MODERATE-	MODERATE--	N/A
Site B	LOW-	LOW	
TRAFFIC IMPACTS	HIGH-	MODERATE-	N/A
PALAEONTOLOGICAL, ARCHAEOLOGICAL AND HERITAGE RESOURCES	LOW-	LOW-	N/A
HEALTH AND SAFETY RISKS	MODERATE	LOW-	N/A
EMPLOYMENT CREATION	LOW+	MODERATE+	MODERATE -
PURCHASING OF MATERIALS FROM LOCAL BUSINESSES	LOW+	MODERATE+	N/A
OPERATIONAL PHASE			
VISUAL IMPACTS			
Alternative 1	HIGH-	HIGH-	N/A
Alternative 2	MODERATE-	MODERATE-	N/A
Site B	LOW-	LOW-	N/A
INVASION OF ALIEN SPECIES	HIGH-	LOW-	N/A
INCREASED STORMWATER RUNOFF AND EROSION POTENTIAL	MODERATE-	LOW-	N/A
CONTAMINATION OF WATER FROM OPERATION ACTIVITIES	HIGH-	LOW-	N/A
SOLID WASTE GENERATION	LOW-	LOW-	N/A

SEWERAGE AND WASTEWATER GENERATION	**MODERATE-**	**LOW-**	**N/A**
NOISE	**LOW-**	**NEGLIGIBLE**	**N/A**
EMPLOYMENT CREATION	**LOW+**	**MODERATE+**	**MODERATE-**

Conclusions and Recommendations

The proposed project has the ability to increase the economic growth within South Africa through foreign investment and funding from international partners. The presence of the Space Observation Station will employ scientific professionals and up and coming scholars. It will also hold exclusive selling power of imagery and other information and will be in high demand as a partner for international space operations as it already has caught the interest of NASA.

Another expected outcome of the project is to provide educational opportunities for universities and their students, especially for those interested in space communications and navigation. Depending on the outcomes of the project, SANSA will be a key role player in long term projects implemented between SANSA and NASA, including assisting with and participating in developing the capabilities needed to send humans to an asteroid by 2025 and Mars in the 2030s.

The proposed project is therefore an important contributor to enhancing South Africa's presence in the growing global space economy and the emerging capabilities.

From a biophysical and heritage perspective, if not properly managed, the project could negatively impact the fauna and flora within the area as well as the cultural landscape of the area, particularly the Matjiesfontein PHS. However, with the implementation of the suggested mitigation measures and continued monitoring, these impacts can be reduced to acceptable levels.

1 INTRODUCTION

1.1 BACKGROUND

The South African National Space Agency (SANSA) intends to develop a space observation facility approximately 4km west of the town of Matjiesfontein in the Laingsburg Local Municipality, Central Karoo District Municipality, Western Cape. The proposed project will involve the construction and operation of radio antennae for tracking satellites in orbit. These antennas will range between 2.4m and 45m in height.

CES has been appointed by SANSA as an independent Environmental Assessment Practitioner (EAP) to undertake a Basic Assessment (BA) and apply for the necessary Environmental Authorisation (EA).

1.2 PURPOSE OF THIS REPORT

In accordance with the National Environmental Management Act (Act 107 0f 1998) (NEMA) and the NEMA EIA Regulations (2014 and subsequent 2017 amendments), the issuing of an Environmental Authorisation (EA) requires the undertaking of a BA process, with associated Public Participation Process (PPP) and specialist studies. This will enable the competent authority to decide whether to issue an EA for the proposed development, and if so, on what conditions.

The EIA Regulations (2014 and subsequent 2017 amendments) allow for a Basic Assessment (BA) process for activities with limited environmental impact (listed in GN R 983 & 985) and a more rigorous two-tiered approach, known as a full Scoping and EIA process, for activities with potentially greater environmental impact (listed in GN R 984).

In terms of the EIA regulations of 2014 (and subsequent 2017 amendments), the triggered activities for this project are listed under Listing Notices 1 and 3 only (published in Government Notices No. R 983 and R 985 respectively), and as such, the Basic Assessment (BA) Process will be followed. Refer to section 4 for a list of the triggered activities.

This report documents the process and findings of the Basic Assessment for the proposed SANSA Radio Antennae Project. This report will be subject to a public comment period after which it will be finalised and submitted to the competent authority for review and decision-making purposes.

1.3 DETAILS AND EXPERIENCE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

1.3.1 Company Profile

CES was established in 1990 as a specialist environmental consulting company based in Grahamstown, with branches in East London, Cape Town, Port Elizabeth and Johannesburg. CES has considerable experience in terrestrial, marine and freshwater ecology, the Social Impact Assessment (SIA) process, and state of environment reporting (SOER), Integrated Waste Management Plans (IWMP), Spatial Development Frameworks (SDF), public participation, as well as the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes. CES has been active in all of the above fields, and in so doing have made a positive contribution towards environmental management and sustainable development in South Africa and many other African countries.

We adopt a scientific approach to our studies, underpinned by an informed and holistic view of the environment and a pragmatic approach to sustainable development. This results in deliverables that are robust, defensible and credible. This is important for both the development and EIA processes, and as a result, the outputs of our studies demonstrate objectivity, sincerity and professionalism. We believe that a balance between development and environmental protection can be achieved by skilful and careful planning and that our outputs reflect this. Our track record across twenty (20) African countries as well as in the Middle East and Asia is evidence of the value add we bring to the environmental and social advisory services we provide and has contributed to our deep understanding of the environmental and social challenges associated with establishing and operating facilities and infrastructure in emerging markets.

1.3.2 CES Project Team

The process where the environmental impacts associated with a project are assessed is a collective effort from a team of appropriate and independent specialists, as well as an independent Environmental Assessment Practitioner (EAP). The BA is required to assess the planned development from a holistic perspective, considering all aspects and characteristics within the affected natural and social environment.

The following consultants have provided expert input and a detailed assessment of the project in order to assess the environmental and social impacts within the affected environment as well as the acceptability of the application.

CES team and responsibilities

CES TEAM MEMBER	PROJECT RESPONSIBILITIES
Ms Skye Clarke-Mcleod	Report Author
Ms Tarryn Martin	Ecological Specialist
Ms Amber Jackson	Faunal Specialist
Dr Ted Avis	Quality Control and EAP

Sub-consultant team members and areas of expertise

TEAM MEMBER	COMPANY	AREA OF EXPERTISE
Nicholas Wiltshire	CTS Heritage	Archaeological Specialist
Jenna Lavin	CTS Heritage	Cultural Heritage Specialist
John Almond	Natura Viva cc	Palaeontological Specialist
Bruce Eitzen	New World Associates	Visual Impact Assessment

Please refer to Appendix G2 for full Curriculum Vitae of the project team

Dr Anthony (Ted) Avis (EAP)

Dr Ted Avis is a leading expert in the field of Environmental Impact Assessments, having project-managed numerous large-scale ESIAs to international standards (e.g. International Finance Corporation). Ted was principle consultant to Corridor Sands Limitada for the development of all environmental aspects for the US$1billion Corridor Sands Project. He has managed ESIA studies and related environmental assessments of similar scope in Kenya, Madagascar, Egypt, Malawi, Zambia and South Africa. Ted has worked across Africa, and also has experience in large scale Strategic Environmental Assessments in southern Africa and has been engaged by the International Finance Corporation (IFC) on a number of projects.

Ted was instrumental in establishing the Environmental Science Department at Rhodes University whilst a Senior lecturer in Botany, based on his experience running honours modules in EIA practice and the environmental field. He is an Honorary Visiting Fellow in the Department of Environmental Sciences at Rhodes. He was one of the first certified Environmental Assessment Practitioners in South Africa, gaining certification in April 2004. He has delivered papers and published in the field of EIA, Strategic Environmental Assessment and Integrated Coastal Zone Management and has been a principal of CES since its inception in 1990 and Managing Director since 1998.

Ted holds a PhD in Botany and was awarded a bronze medal by the South African Association of Botanists for the best PhD adjudicated in that year, entitled “Coastal Dune Ecology and Management in the Eastern Cape”. Ted is a Certified Environmental Assessment Practitioner (since 2002) and a professional member of the South African Council for Natural Scientific Professionals (since 1993).

Ms Tarryn Martin (Project Lead and Quality Control).
Tarryn holds a BSc (Botany and Zoology), a BSc (Hons) in African Vertebrate Biodiversity and an MSc with distinction in Botany from Rhodes University. Tarryn's Master's thesis examined the impact of fire on the recovery of C_3 and C_4 Panicoid and non-Panicoid grasses within the context of climate change for which she won the Junior Captain Scott-Medal (Plant Science) for producing the top MSc of 2010 from the South African Academy of Science and Art as well as an Award for Outstanding Academic Achievement in Range and Forage Science from the Grassland Society of Southern Africa. Tarryn specialises in conducting vegetation assessments in South Africa, Mozambique and other African countries. These assessments are often to IFC standards, specifically Performance Standard 6. Tarryn has also undertaken critical habitat assessments for areas requiring biodiversity offsets. Other botanical related work includes, developing alien management plans as well as implementing a terrestrial monitoring plan, which includes monitoring forest health, at Kenmare Moma Heavy Minerals Mine.

Ms Amber Jackson (Faunal Specialist)
Amber holds a Masters in Environmental Management from the University of Cape Town and has a background in both Social and Ecological work. Her undergraduate degrees focused on Ecology, Conservation and Environment with particular reference to landscape effects on Herpetofauna, while her masters focused on the environmental management of social and ecological systems. With a dissertation in food security that investigated the complex food system of informal and formal distribution markets. At CES, Amber has been responsible for the management of projects and specialist teams, the preparation and monitoring of project budgets in excess of $500 000. She has managed Environmental, Social and Health Impact Assessments for projects in the renewable, housing, agri-forestry and mining sectors in Mozambique and South Africa to national and international lenders standards including the AfDB, EIB, FSC and IFC. Amber specializes in faunal assessments and has conducted a number of these in the both South Africa and Mozambique to international standards, the majority were assisted by and to Prof Bill Branch. She has recently concluded an Environmental and Social Rik management course with the IFC held in Johannesburg over 2018.

Ms Skye Clarke-Mcleod (Project Manager and Report Author)
Skye is beginning her journey as an environmental consultant at CES, she holds a BA degree in Environmental Management from the University of South Africa (2018), majoring in Geography and Social Sciences. With a background in hospitality management and administration, she is also filling the role of office assistant. Her areas of interest include Biodiversity Management, GIS and the EIA process. She has recently submitted her application to complete her honours degree in Environmental Management through the University of South Africa

Ms Jenna Lavin – Subconsultant Heritage Specialist (CTS Heritage)
Jenna holds an MSc in Archaeology from UCT and has eight years' experience in heritage management. Jenna's previous position as the Assistant Director for Policy, Research and Planning at Heritage Western Cape, the state organisation managing heritage for the Western

Cape Province, has provided her with an in-depth understanding of national and international heritage legislation. Her experience at various heritage authorities in South Africa, including the national heritage authority, means that she has dealt extensively with permitting, policy formulation, compliance and heritage management at national and provincial level and has also been heavily involved in rolling out heritage management training to provincial and local authorities. She has worked within the UNESCO WHS frameworks for the nomination and ongoing management of tentative and existing World Heritage Sites including the Cradle of Mankind and the Modern Human Origins Serial Nomination. While at CTS Heritage, Jenna has successfully project-managed a number of large scale heritage related projects with a variety of budget constraints. Jenna is current Chair of the Association of Professional Heritage Practitioners (APHP), and is also an active member of the International Committee on Monuments and Sites (ICOMOS) as well as the International Committee on Archaeological Heritage Management (ICAHM). Jenna has lectured as part of the University of Cape Town's Archaeology Honours Program on Heritage Management, and has recently contributed to the development of the George Washington University Field School focussing on Heritage Management and Cultural Tourism.

Mr Nicholas Wiltshire – Subconsultant Heritage Specialist (CTS Heritage)

CTS Heritage director, Nicholas Wiltshire , has more than 20 years' experience working in software solutions, Geographical Information Systems (GIS) and over 10 years of experience in the heritage sector, as well as an MSc in Archaeology from UCT. Nicholas was responsible for the development of South Africa's national heritage management system, the South African Heritage Resources Information System (SAHRIS). SAHRIS was developed using Drupal and Geoserver, both Free Open Source Software (FOSS) systems, between 2011 and 2013

Dr John Almond- Subconsultant Palaeontological Soecialist

Dr Almond is one of the leading experts in the field of Palaeontology in South Africa. Her has over 35 years of experience and research to his name, the past 17 years of which he has held the title of managing member of Natura Viva cc. John holds a PhD in Palaeontology from the University of Cambridge and is a member of the Palaeontological Society of South Africa, Geological Society of South Africa as well as the Association of Heritage Assessment Practitioners (AHPA). He has published numerous articles and reports over the years and organised the 15th biennial conference of Palaeontological Society in Matjiesfontein in 2008.

Bruce Eitzen- New World Associates

Bruce is a registered Landscape Architect and Environmental Planner with the South African Council of Landscape Architecture Professionals (SACLAP) and Specialist Practitioner in Visual and Landscape Heritage with thirty years of experience across the board of landscape architecture and environmental planning. And has practised in South Africa, Central Africa and East Africa. He holds a BSc (Botany) from the University of Cape Town and a Masters in Landscape Architecture from the University of Pretoria. He served for three years three years on the Association of Professional Heritage Practitioners (APHP) Executive Committee chairing Professional Practice. He also served on the National Executive Committee of the Institute for Landscape Architects in South Africa (ILASA) and was the Chair of ILASA Cape for four years. He also chaired the Local Organising Committee for the International Federation of Landscape Architect's 2012 World Congress (IFLA 2012) held in Cape Town.

1.4 Nature and Structure of the Report

The structure of this report is based on Appendix 1 of GN R 982, of the EIA Regulations (2014 and subsequent 2017 amendments), which specifies the required content of a Basic Assessment Report.

Chapter 1 introduces the proposed project and describes the purpose of this report and its structure.

Chapter 2 details the project location and describes the proposed project in detail, including primary infrastructure such as the antennae types and infrastructural requirements.

Chapter 3 describes the need and desirability of the project.

Chapter 4 describes the legislation that is applicable to the project.

Chapter 5 describes the Public Participation Process (PPP) undertaken.

Chapter 6 describes the biophysical and social environment of the proposed project site.

Chapter 7 provides a sensitivity analysis.

Chapter 8 provides a description of the alternatives to the proposed development, or components of the proposed development.

Chapter 9 describes the impact assessment methodology used to assess impacts.

Chapter 10 assesses the impacts of the project on the social and biophysical environment.

Chapter 11 provides recommendations and concludes this report.

1.5 Limitations and Assumptions

It is assumed that should any changes be made to the proposed layout as defined in this report, that revised specialist impact assessments may need to be undertaken, the same being true of changes to the proposed location or infrastructure proposed.

The ecological impact assessment report is based on current available information and, as a result, a detailed faunal survey was not conducted. The faunal survey was mainly a desktop study, using information from previous ecological surveys conducted in the area, supplemented by recording animal species that were observed during the site survey.

The desktop analysis of hydrological features was based largely on the data from the National Biodiversity Assessment (NBA) (2018) as it incorporates the data of the NFEPA project and the SAIIAE.

Species of Conservation Concern (SCC) are difficult to find and difficult to identify, thus species described in the ecological impact assessment report do not comprise an exhaustive list. It is almost certain that additional SCCs will be found during construction and operation of the development.

Site sampling could only be carried out at one stage in the annual or seasonal cycle. The botanical field survey was conducted in late winter/early spring when most plants were flowering. However, late flowering species could not be identified and Consequently, some plant species may have gone undetected. However, the time available in the field, and information gathered during the survey was sufficient to provide enough information to determine the status of the affected area.

1.6 SCOPE OF ASSESSMENT AND CONTENT OF THE BASIC ASSESSMENT REPORT

Section 3 of Appendix 1 of GN R982, as amended, specifies the content requirements for a Basic Assessment Report. The table below indicates how this document complies with these requirements.

Section 3	*NEMA EIA Regs – Appendix 1 Requirement*	*Section in Report*
(a)	Details of- (i) The EAP who prepared the report; and (ii) The expertise of the EAP, including a curriculum vitae;	 Section 1.3 Appendix G2
(b)	The location of the activity, including- (i) The 21-digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 2.1
(c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is- (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 2.1 and Section 2.2
(d)	A description of the scope of the proposed activity, including- (i) All listed and specified activities triggered; (ii) A description of the activities to be undertaken, including associated structures and infrastructure;	Section 4.1 Section 2.2
(e)	A description of the policy and legislative context within which the development is proposed including: (i) An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Section 4.2
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 3
(g)	A motivation for the preferred site, activity and technology alternative;	Chapter 8
(h)	A full description of the process followed to reach the proposed preferred alternative within the site, including - (i) Details of all the alternatives considered; (ii) Details of the PPP undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) A summary of the issues raised by I&APs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	 Chapter 8 Chapter 5 and Appendix F N/A

	(iv) The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) The impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- (aa) Can be reversed; (bb) May cause irreplaceable loss of resources; and (cc) Can be avoided, managed or mitigated; (vi) The methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives; (vii) Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) The possible mitigation measures that could be applied and level of residual risk; (ix) The outcome of the site selection matrix; (x) If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and (xi) A concluding statement indicating the preferred alternatives, including preferred location of the activity;	Chapter 6 Chapter 8, Chapter 10 and Annexure 1 Chapter 9 Chapter 10 Chapter 8 Section 11.5
(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including - (i) A description of all environmental issues and risks that were identified during the EIA process; and (ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 11 and Appendix B
(j)	An assessment of each identified potentially significant impact and risk, including— (i) Cumulative impacts; (ii) The nature, significance and consequences of the impact and risk; (iii) The extent and duration of the impact and risk; (iv) The probability of the impact and risk occurring; (v) The degree to which the impact and risk can be reversed; (vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) The degree to which the impact and risk can be avoided, managed or mitigated;	Chapter 9
(k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapter 10

(l)	An environmental impact statement which contains— (i) A summary of the key findings of the EIA; (ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 7 Chapter 10
(m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	Section 11.3 and 11.4
(n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Chapter 11.5
(o)	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Section 1.5
(p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 11.5
(q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
(r)	An undertaking under oath or affirmation by the EAP in relation to— (i) The correctness of the information provided in the reports; (ii) The inclusion of comments and inputs from stakeholders and I&APs; (iii) The inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) Any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs;	Appendix G3
(s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
(t)	Any specific information that may be required by the competent authority; and	N/A
(u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

SANSA proposes to construct new radio antennae and associated infrastructure on Portion 8 of Farm 148 (Koenie Kraal), near Matjiesfontein in the Western Cape in fulfilment of their vision to coordinate and integrate national space science and technology programmes and conduct long-term planning and implementation of space-related activities in South Africa.

SANSA have identified two sites wherein they intend to construct new radio antennae and associated infrastructure (Figure 2-1).

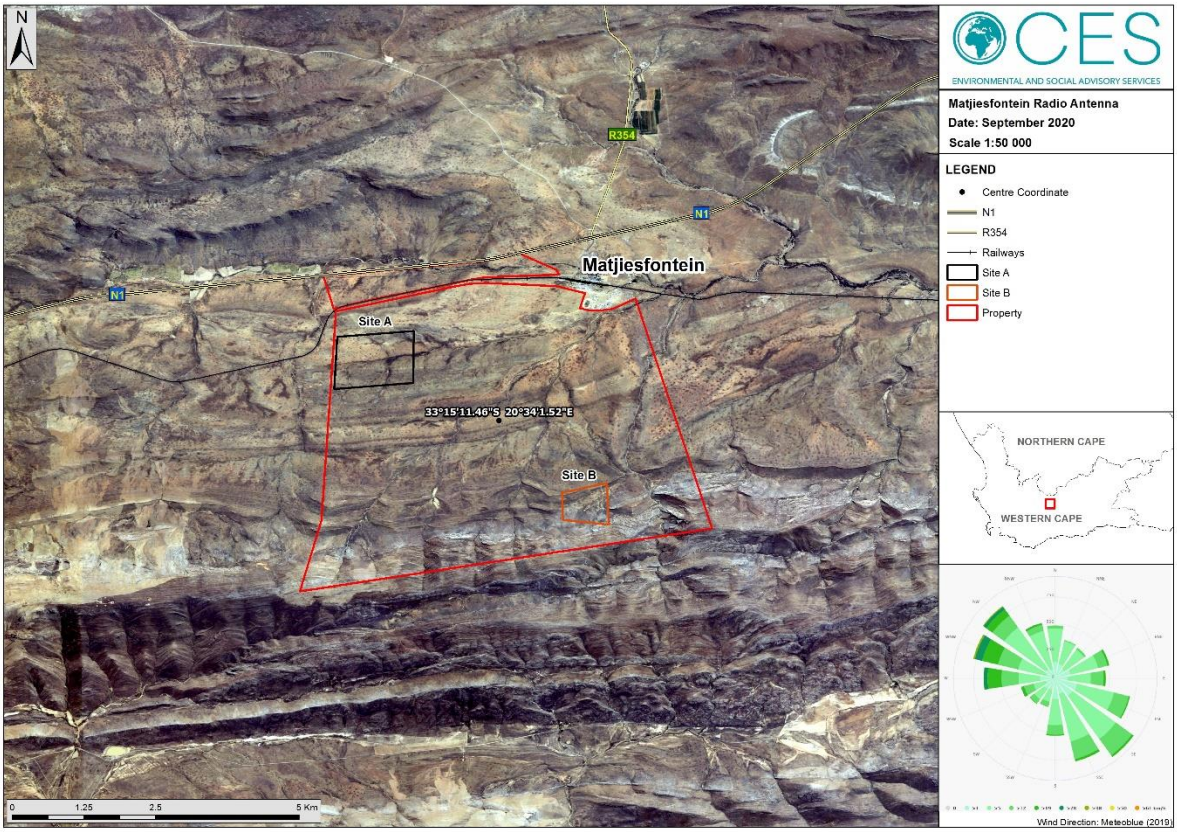


Figure 2-1. Two proposed sites (A&B) for construction on Portion 8 of 148 (Koenie Kraal) near Matjiesfontein.

An alternative site was previously assessed for the proposed location of Site A, but was found to be unsuitable due to the high visual intrusion it was anticipated to have on the Provincial Heritage Site of Matjiesfontein Village. This site will be discussed in more detail in the alternatives chapter (Chapter 8)

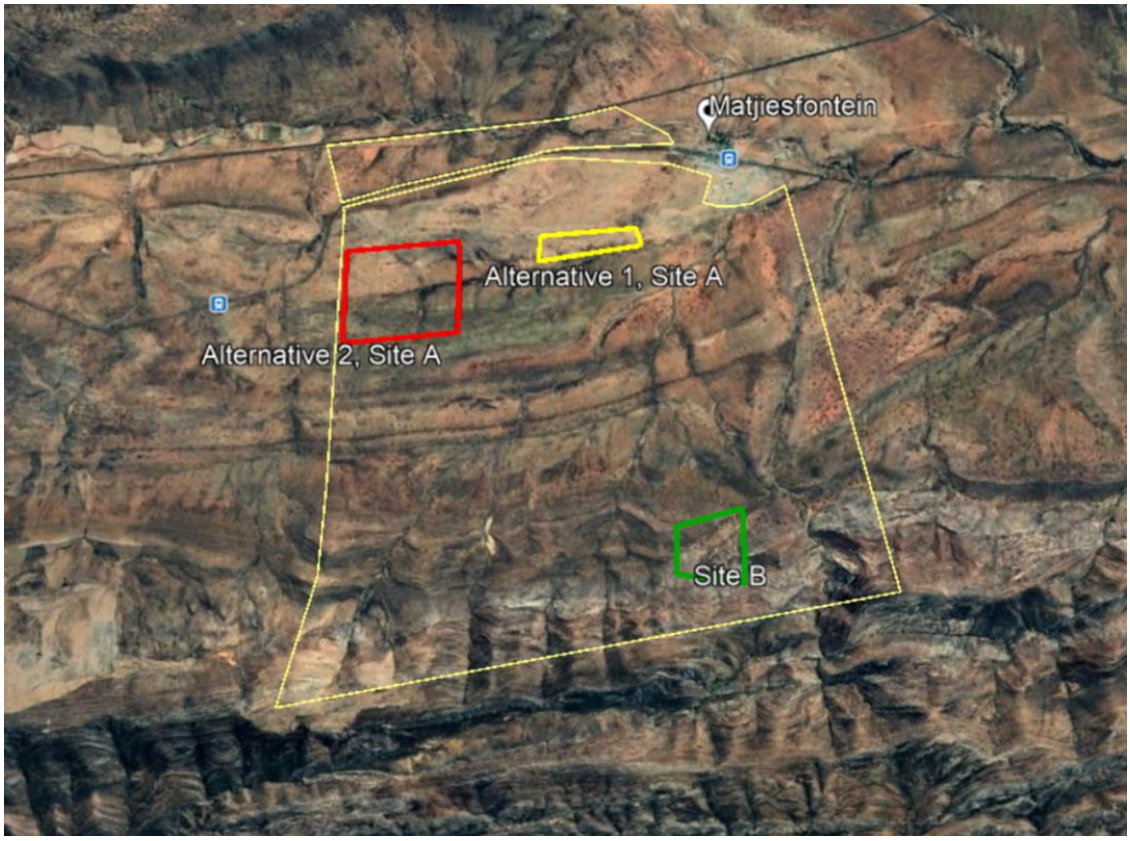


Figure 2-2: Map showing Alternative 1, Site A in relation to preferred Alternative 2, Site A

Table 2-1 indicates the property portion and farm name associated with the proposed development. Although the total area of the potentially affected property is 140.86 ha, the infrastructure associated with the construction of radio antennae will have a development footprint of only 3.37ha (2.39% of the farm portion) and will fall within two smaller parcels of the farm portion as indicated in Figure 2.1 above. These parcels are referred to as Site A and Site B, their corresponding sizes are displayed in table 2-2 below and their location illustrated in Figure 2-2. An A3 locality map is also attached in Appendix A.

Table 2-1 Property portion and farm name associated with the project area.

DESCRIPTION OF AFFECTED FARM PORTION			
Farm Name	**Farm number**	**21 digit SG Code**	**Size (ha)**
Matjiesfontein (Koenie Kraal)	148/8	C04300000000014800008	2367.87

Table 2-2-: Proposed development parcels within the property portion

Site Parcel Number	Size (m^2)	Size (Ha)	Area impacted by the project infrastructure
Site A	1 013 388m^2	101.34Ha	<4ha
Site B	395.281.335m	39.52Ha	

2.2 PROJECT DESCRIPTION

Two areas within portion 8 of Farm 148 Koenie Kraal have been selected for the development and will be referred to as Site A and Site B.

The infrastructure within Site A will consist of 4, large Deep Space Navigation **(DSN 1-4)** antennae which will not exceed 45m in height. Each of these are anticipated to have a physical footprint of 360m² (Figure 2-1) as well as 3 smaller planned radio antennae up to 12m in height **(SANSA 1,2,3)** (Figures 2-3 and 2-4). Each of these antennae are expected to have a physical footprint of 100m². There will also be an 18 m Ka Band antenna **(LGS 18**) which will be up to 30m in height and have a footprint of 400m² (20mX20m) seen in Figure 2-2 below.

Other associated infrastructure will consist of a guard house at the site entrance, signal processing building which will house the signal processor room, operations and control room, lobby, reception, kitchen and ablution facility and is anticipated to have a physical footprint of 525m², with an accompanying 900m² curbed, gravel parking area.

Alongside the main building will be a 70 000l water storage tank as part of a fire management system and a conservancy tank for temporary wastewater and sewerage storage which will be serviced regularly by a licenced waste hauling company.

On the western edge of the site, a power station is planned which will be of similar size to the main building on the eastern edge. The power station will consist of the stores, workshop, generators and fuel storage and will also have an accompanying 900m², curbed parking area. An overhead powerline (not exceeding 22kv), 750m in length is planned to connect the power station to the existing Eskom substation outside the site. The generators will be installed in phases as the site expands. The first generator of four will be 1200 KVA and be housed in the generator room(Total capacity 4800KVA)

Electricity will be distributed within the site through underground cables from the power station to the antennas and buildings, these will be at a depth of 1m with a 200mm covering of river sand, a layer of danger tape and backfilled with the original soil.

The diesel storage at the power station has a combined storage capacity of 280 000lt. This will be stored above ground in self-bunded, moveable systems. Each bunded tank holds 70 000lt and will be connected to one another as the site grows and the power capacity needed increases.

Water will be sourced from a municipal water point approximately 2km from the site and will need connection via underground pvc piping 50mm in diameter. It is expected that between 50 and 100 kilo litres of water will be needed daily during the civil work phase of construction and for dust suppression and 3000 litres will be needed for the general operations. SANSA also intends on drilling a borehole to supplement water provisions.

New access roads will need to be constructed within the site and are anticipated to be 4m wide, graded and compacted with overlain gravel.

PVC ducting will be lain to connect the fibre to the control room and to each antennae. This will be lain at 600mm below ground surface, consisting of 4x100mm PVC pipes with a PVC manhole at 50m intervals for maintenance.

The entire site will be fenced, with either diamond mesh with flatwrap on top or clearvu fencing. All construction spoil, including excavation and clearing will be taken to the Majiesfontein solid waste disposal site

Site B will house 2 scientific instruments known as short/long laser rangers (S/LLR), each with a footprint of 14.2m² (the size of a Shipping container) and an administration booth with a footprint of 9m² (3mX3m). Solar panels will form part of the roofing of the infrastructure in order to supply power to the equipment. The scientific instruments will each be individually fenced by a standard 3m high, 10m x10 diamond mesh fence with flat rap at the top. The existing access roads to this site will remain unchanged, however new internal gravel roads, 4m wide, will be needed to access the infrastructure

The two 900m² parking areas will be used as the laydown areas for the construction period of the project. It is expected that the project infrastructure will be constructed in a phased manner. Within the first 3 years, the buildings, S/LLR's, utilities, roads and the LGS18 antenna will be constructed. For every two years which proceed, one additional antenna will be constructed. The maximum time expected for the completion of the project is estimated at 17 years.

Project infrastructure maps and images of proposed infrastructure are presented in Figure 2-3 through Figure 2-10 below.

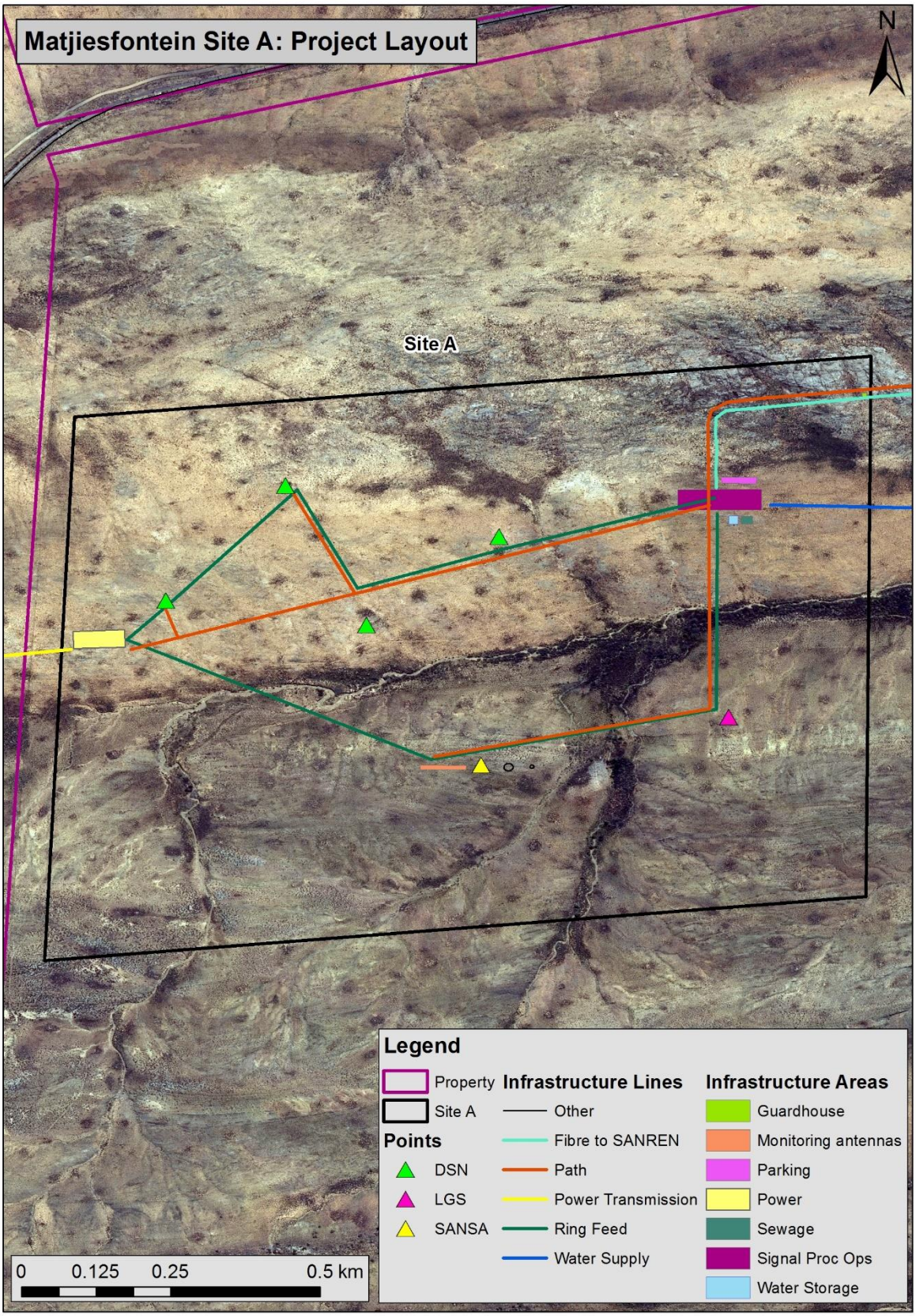


Figure 2-3: Proposed infrastructure on Site A

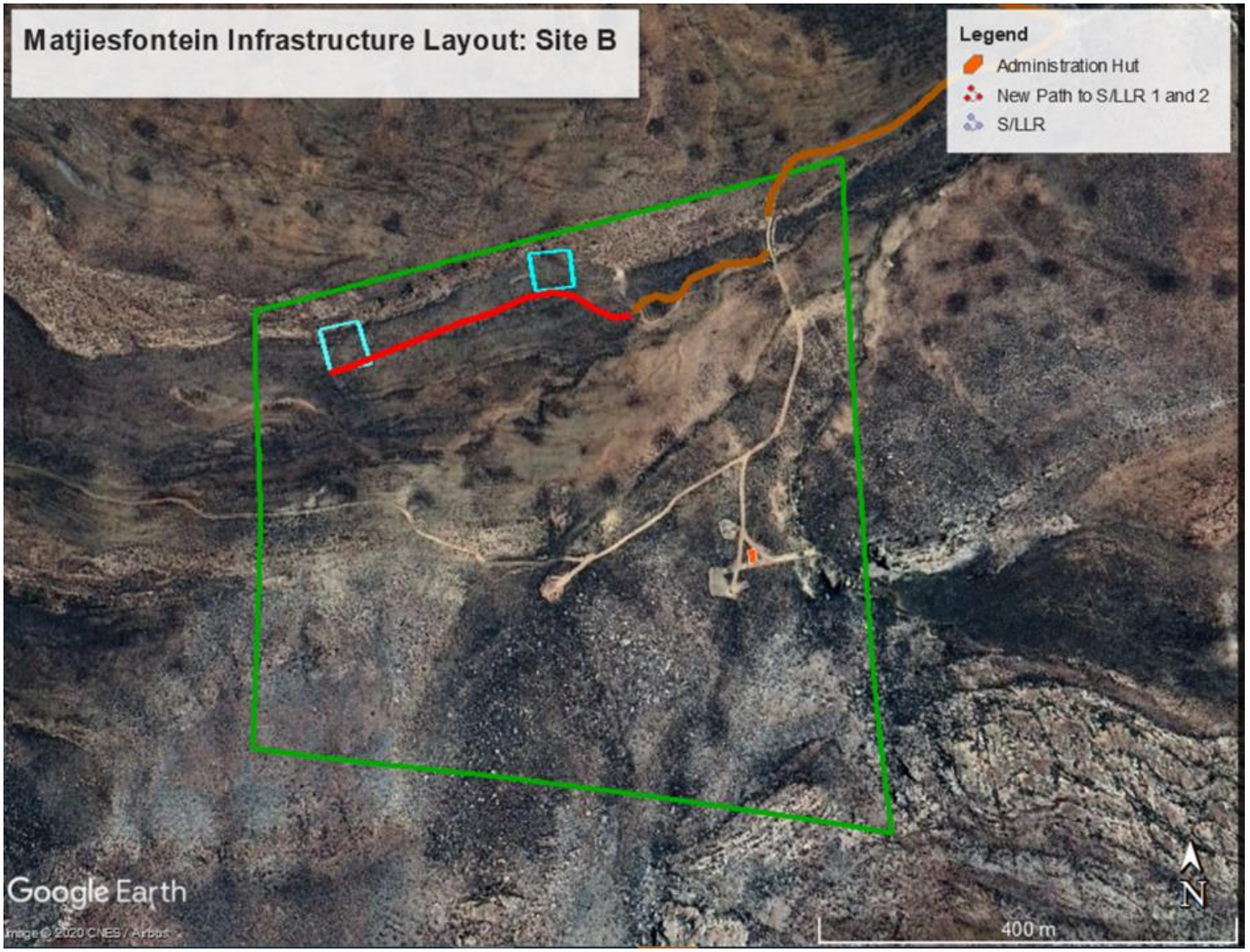


Figure 2-4:Proposed infrastructure on Site B

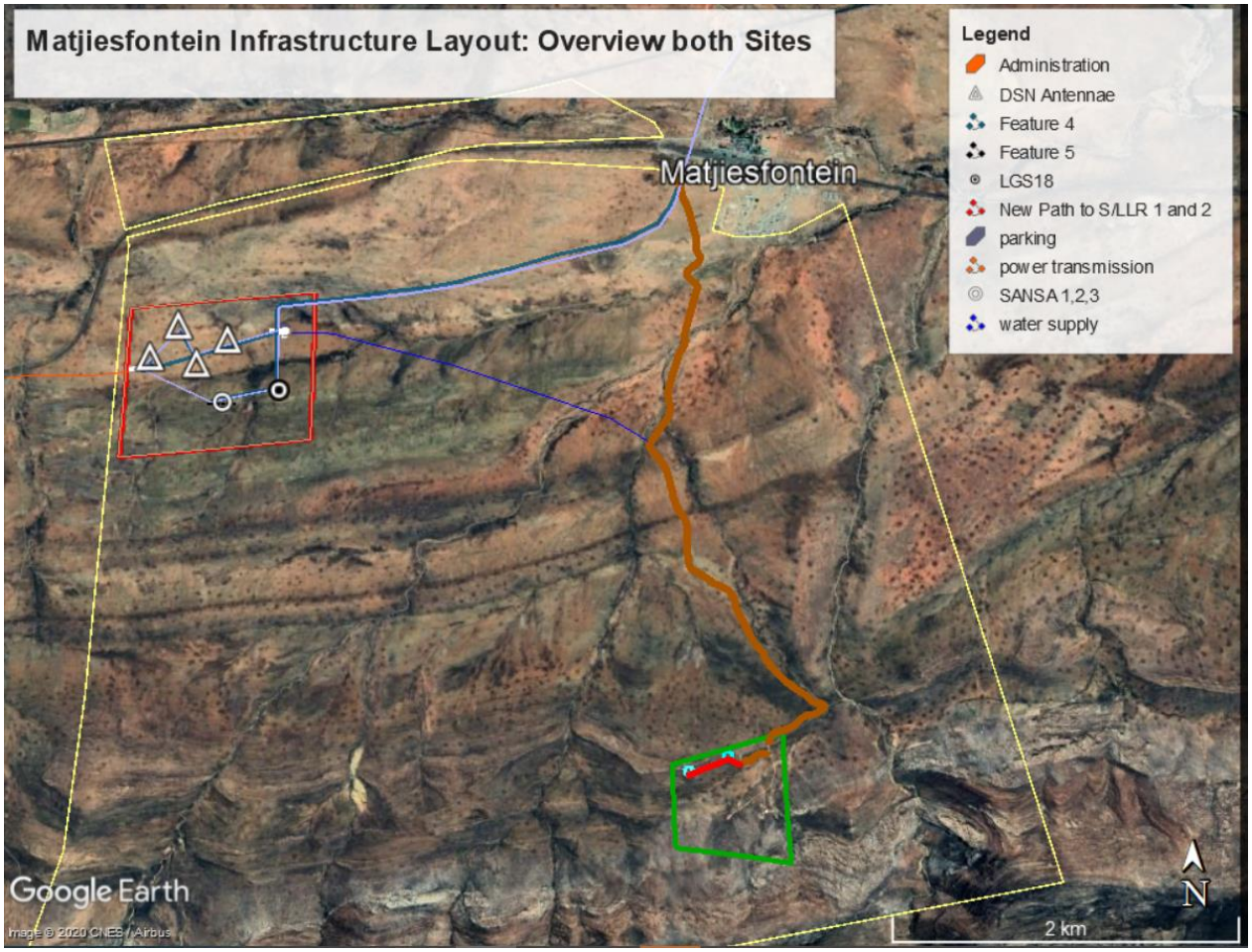


Figure 2-5:Overview of Infrastructure on both Sites

Figure 2-6: Deep Space Navigation (DSN) Antenna, up to 45m.

Figure 2-7: LGS18, Ka Antenna, 18m wide dish, 30m height.

Figure 2-8: SANSA (1,2,3) This is a typical 6m antenna with a height of up to 12m.

Figure 2-9: SANSA(1,2,3)Typical 2,4m to 3,3 m antenna with a concrete base

Figure 2-10: Short/Long Laser Ranger (S/LLR).

2.3 SUITABILITY OF THE MATJIESFONTEIN SITE

Site feasibility studies were undertaken to select the most appropriate areas, according to the below criteria. Analysis of the weather conditions between 2003 to 2017 were taken into consideration and a geotechnical survey was undertaken at Site B.

The project site proposed for the development of the radio antennas displays characteristics which make it suitable for space exploration. These include:

- **Frequency stability**
  The sparse population and lack of development in the area surrounding the proposed site (200kms to the nearest city) is an environment with low to no interference on radio frequencies. The climate in the area is semi-arid and receives less than 100ml of rainfall in a year which eliminates the risk of rain fade which can impair signal transmission and reception and cause temporary degradation in radio frequency communications.
- **Topography**
  The natural undulating landscape makes the site ideal in that the antennas can be positioned in such a way as to minimise their visual impacts.
- **Current Land Use**
  The current land use of the project site is vacant, apart from a mountain bike track which runs through the farm and is used recreationally by the guests of The Lord Milner Hotel (which is also the landowner). The surrounding areas are dominated by agriculture in the way of small grazing livestock such as sheep or game and where irrigation is possible, the production of citrus.
- **Proximity to towns with need for Socio-Economic Upliftment**

See Section 6.5 below There is a need for employment opportunities within the area, as well as the socio-economic benefits which will be associated with the development of the radio antennae, predominantly during the construction phase. Though it's contribution to the global space economy would be the most notable.

2.4 USE OF SERVICES AND RESOURCES

Water

Water will be required for potable use and in the construction of the foundations for the masts and associated infrastructure. It is expected that between 50 and 100 kilo litres will be needed on a daily basis during the civil works phase of construction and approximately 3000 litres will be needed during the operations phase. The water will be sourced from the municipal reservoir in Matjiesfontein Town, which will be piped into the site via an underground pipe. SANSA also proposes the drilling of a borehole on site to supplement the water supply.

Sewerage

Chemical toilets will be made available for use by project staff during the construction phase, which will be serviced regularly by the supplier. Ablution facilities will form part of the main building and control room at Site A. The ablution facilities will feed into an underground conservation tank which will temporarily store black and grey water. The conservation tank will need to be drained by an approved waste transportation carrier (sucking susan) and transported to the Matjiesfontein package plant for treatment.

Storm Water

The construction of infrastructure will require the clearing of vegetation which will result in exposed soil surfaces. These exposed surfaces may potentially increase stormwater runoff. Stormwater will therefore be managed in line with the EMPr, which will be compiled for the proposed works.

Solid Waste Disposal

All solid waste will be collected and stored temporarily in scavenger and weatherproof containers until removed to an appropriately registered landfill site in close proximity to the construction site. This is inclusive of all construction spoils, excavated sand and cleared vegetation.

Electricity

Diesel generators will be utilized for the provision of electricity during the construction phase on both sites. Site A will be connected to the Eskom power supply by a 22kV, overhead transmission line, 750m in length for the operational phase of the project, whilst at Site B, solar panels will form part of the roofing of infrastructure in order to power the equipment.

3 PROJECT NEED AND DESIRABILITY

3.1 ADVANCES IN SCIENCE, TECHNOLOGY AND INNOVATION IN A LOCAL AND INTERNATIONAL CONTEXT

SANSA was created to promote the use of space and strengthen cooperation in space-related activities while fostering research in space science, advancing scientific engineering through developing human capital, and supporting industrial development in space technologies. Their vision is for South Africa to be an international hub for space solutions for the world of the future. Their intention is to lead and inspire the South African space community to create a better future.

The research and work carried out at SANSA focuses on space science, engineering and technology that can promote development, build human capital and provide important national services. Much of this work involves monitoring the Earth and our surrounding environment, and using the collected data to ensure that navigation, communication technology and weather forecasting services function as intended.

SANSA has produced a number of Earth observation and other data products for public use or for specific stakeholders. These include an Informal Settlement Atlas, an annual country mosaic based on satellite images, a flood risk map that supports an early warning system, and a human settlements map layer that supports spatial planning and service delivery projects. The Earth Observation programme has also maintained the Online Catalogue for data discovery and dissemination.

SANSA's Head Office in Pretoria oversees SANSA operations and management of the Earth Observation programme, the Space Operations programme (both in Hartebeesthoek); and the Space Science programme (Hermanus); as well as a newly established Space Engineering programme situated alongside the Head Office in Pretoria.

SANSA has built strong international relationships through launch support for NASA, CNES and the Indian Space Research Organisation (ISRO), among others, as well as through partnerships with organisations like Airbus Defence and Space (ADS) and Avanti Communications. There is appetite within this community for the construction of radio antennae at Matjiesfontein for tracking satellites in orbit for advancement in science, technology and space exploration.

Since its inception, SANSA has built partnerships with international organisations, grown capacity and infrastructure to do world-class space science research, and started work on South Africa's third satellite and recently completed the state-of-the-art Optical Space Research Laboratory (OSR) at the South African Astronomical Observatory (SAAO) in Sutherland.

The facility proposed at Matjiesfontein will provide crucial space science data to meet national and international obligations, raise the standard of South African research, and improve our understanding of the Earth's middle and upper atmosphere while also generating an income for the South African economy.

3.2 SOCIAL AND ECONOMIC DEVELOPMENT

SANSA's Space Operations is the most advanced ground station in Africa, with the ability to track all telemetry, tracking and control frequencies presently used in the global space industry. South Africa's location is unique in that it acts as the last downlink for satellites before they go over the South Pole. Their ability to track any Earth Observation satellite, whether for South African or international use, makes them highly sought after.

SANSA Space Operations has the vantage point, due to South Africa's location, of providing visuals of the second stage of launches, particularly American launches and is able to capture the separation of spacecraft from the second stage of the launch, which means that their collaboration on these launches is very important to the agency or company responsible for the launch, making SANSA's Space Operations a very important local element in the global space economy. SANSA currently has 11 international partners and many of its services are provided on a commercial basis, paid for in hard currency. Their current strategic focus is to increase the portfolio with the proposed project to meet the international demand for greatly increased data reception and transmission and global navigation satellite systems.

SANSA and NASA have entered into a study agreement to collaborate in conducting technical and environmental research on the potential to establish a ground station in South Africa that will support future near-Earth and deep space exploration, including NASA's planned Artemis mission to send the first woman and the next man to the surface of the Moon, as directed by the President of the United States.

The proposed project is therefore an important contributor to these goals as well as enhancing South Africa's presence in the growing global space economy and the emerging capabilities. The expected outcome of the project is to provide educational opportunities for universities and their students, especially for those interested in space communications and navigation. Depending on the outcomes of the project go ahead, SANSA will be a key role player in long term projects implemented between SANSA and NASA, including assisting with and participating in developing the capabilities needed to send humans to an asteroid by 2025 and Mars in the 2030s.

According to South Africa's National Space Strategy, which has the objective of leveraging the benefits of space science and technology for socio-economic growth and sustainable development, there are areas outlined therein which consistently demonstrate benefits to society and economic growth and are core areas of focus in order to meet targets in years to come.

SANSA space operations already play an important role in supporting space exploration. It is considering an approach from international partners to establish ground segment infrastructure for a deep space tracking facility which would be able to support unmanned and future manned missions to Mars and unmanned missions beyond Mars.

In a more broad-based context, the project at Matjiesfontein, as an addition to SANSAs existing stations in South Africa, will be a contributor to innovation, culture and inspiration as well as a new means to address global challenges.

This project will also open another platform for the provision of bursaries to the South African community, (which SANSA is already providing), based on their acknowledgement that South Africa needs an increase in science and engineering graduates to effectively resource the country with necessary and scarce skills in order to achieve the goals of the National Development Plan and ensure a successful and sustainable future for our citizens. The bursaries which they provide are a contribution towards the national target for qualified postgraduates in science and engineering.

As is within the context of South Africa's National Research and Development Strategy (2002) it has been put forward that the creation of wealth in the global economy relies on developing human resources which requires exerting a maximum effort to train the necessary number of people in all the fields required for the development, running and management of modern economies. This effort is required on a national scale and should be considered as an investment in the country's future and not as a cost.

The proposed scientific instruments and antennas which are for deep space communication, will fulfil the roles of satellite navigation as they track satellites in orbit, satellite communication as information is transferred from satellites to the ground station. This forms an integral part of space science and exploration as information and data need to be collected in order to conduct in-depth research into the surrounding environment and in outer space.

3.3 SUPPORTING POLICY DOCUMENTS

The need and desirability of the proposed SANSA antenna construction can be demonstrated in the following main areas:

- Advance research in science, technology, innovation and space operations;
- Create and grow South Africa's presence within international space science and exploration
- Increase job creation within the scientific sector

The above main drivers for developments in advancing science, technology and innovation are supported by International, National and Provincial (Western Cape) policy and planning documents

3.3.1 District and Provincial Level

The proposed development of space antennae, aims to promote local economic growth and development through the creation of direct and indirect employment opportunities.
The proposed development is in line with the Karoo District Municipality Integrated Development Plan (IDP) as it will contribute to the creation of a few employment opportunities which is a goal of the Municipality's IDP:

"Promote regional, economic development, tourism and growth opportunities"

Laingsburg Local Municipality IDP and Laingsburg District Municipality IDP and SDF

These Municipal Integrated Development Plans (IDP's) provide a strategic direction to align the efforts of all governments' spheres with the aim of improving the quality of life for all the people living within the municipality.

The Spatial Development Framework (SDF) is the legislated component of the municipality's IDP and is the municipality's long-term vision for spatial development. However, the SDF should not be interpreted as a blueprint aimed at managing physical development, but rather as a framework giving strategic guidance to development in the municipality while allowing it to grow and adapt to changing circumstances.

The proposed project will:

- *Create temporary job opportunities for people in surrounding communities.*
- *Aid in the alleviation of poverty and provide upliftment to the surrounding communities.*
- *Ensure efficient growth as the development will not increase the burden on Municipal services.*

The proposed projects aligns with the PSDF by way of its investment in social and economic infrastructure, which will have a long-term benefit provided from a relatively small development which is expected to have minor impacts on the surrounding environment, especially when compared with the manifold and multi-sectoral benefits which are expected to ensue and this will be on a local, regional, national and global scale.

Western Cape Provincial Spatial Development Framework

3.3.2 National Level

The proposed development is in line with the South African National Space Agency's Act which is to "*foster research in space science, advance scientific engineering through human capital, support the creation of an environment conducive to industrial development in space technologies within the framework of national government policy*"

The National Development Plan (NDP) aims to promote sustainable and inclusive development in South Africa to reduce and ultimately eliminate poverty. Of the twelve (12) key focus areas of the NDP, the proposed project will contribute to (1) an economy which will create more jobs, (2) positioning South Africa in the world by offering space exploration services to international companies and thereby generating an income for the country.

On the 24th of July 2020, a Government Gazette (No. 43547) was issued that designated several infrastructure projects as Strategic Infrastructure Projects, forming part of the Presidential Infrastructure Coordination Committee. The Space Infrastructure Hub proposal which was submitted by SANSA has been declared as 'Strategic Infrastructure Project 22".

The Space Infrastructure Hub is based on the space value chain. This includes a number of satellite builds, a new ground segment, an expanded data segment and a new data visualisation centre, the activation of the satellite based augmentation system over Southern Africa that was piloted a few years ago, the development of products and services for use across all spheres of government, as well as human capital development and training.

The new ground segment mentioned above will be housed at the proposed Matjiesfontein site and the establishment of basic infrastructure at the site is therefore regarded as a priority, with the possible expansion to a NASA Deep Space Tracking site.

Domestic access to this type of infrastructure will reduce South Africa's reliance on other countries for the type of information that these satellites can make available and is expected to reduce the timeframes for collecting necessary data.

When considering the overall need for the development, it forms part of a long-term investment in a developing industry which can contribute to the enhancement of many other sectors with the research it is able to provide

Therefore, considering the above need for the project from a national, provincial and local level, it can be concluded that the SANSA antenna construction will contribute to the enhancement and development of an important sector, while also assisting with the alleviation of poverty through improving economic and social structures.

4 LEGISLATED BA PROCESS

4.1 ENVIRONMENTAL AUTHORISATION IN SOUTH AFRICA

The regulation and protection of the environment within South Africa, occurs mainly through the application of various items of legislation, within the regulatory framework of the Constitution (Act 108 of 1996).

The primary legislation regulating Environmental Impact Assessment (EIA) within South Africa is the National Environmental Management Act ("NEMA" Act 107 of 1998). NEMA makes provision for the Minister of Environmental Affairs to identify activities which may not commence prior to authorisation from either the Minister or the provincial Member of the Executive Council ("the MEC"). In addition, NEMA also provides for the formulation of regulations in respect of such authorisations.

The EIA Regulations (2014 and subsequent 2017 amendments) allow for a basic assessment process for activities with limited environmental impact (listed in GN R No. R327 & No. 324, 2014, as amended) and a more rigorous two tiered approach to activities with potentially greater environmental impact (listed in GN R No. 325, 2014, as amended). This two-tiered approach includes both a Scoping and EIA process.

In terms of the EIA regulations of 2014 (and subsequent 2017 amendments), The South African National Space Agency requires Environmental Authorisation, from the Department of Environment, Forestry and Fisheries (DEFF), for the proposed construction of radio antennae. The triggered activities are listed under Listing Notice 1&3 (published in Government Notice No. R 327 & No. R 324) and as such, the Basic Assessment (BA) Process needs to be followed.

The listed activities that have been applied for are provided in Table 4.1 below.

Table 4-1: Listed activities potentially triggered by the proposed construction of radio antennae.

Activity Number	Activity	Project component triggering activity
Listing Notice 1 (GNR 327)		
12	The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres or more; (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The combined physical footprint of the development is approximately 33 738m² and some infrastructure, such as the fencing, will be located within 32m of a watercourse.
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The proponent intends on storing 4 self-bunded containers of diesel, each with a capacity of 70 000l. Total 280 cubic metres
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation,	Including new roads 3.37 ha is anticipated for clearing
Listing Notice 3 (GNR 324)		
3	The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (c) Is to be placed on a site not previously used for this purpose; and (d) Will exceed 15 metres in height (ii) Western Cape (i) All areas outside urban areas	The radio antenna will be up to 45m in height and located on a greenfields site.

4	The development of a road wider than 4 metres with a reserve less than 13,5 meters (iii) Western Cape (iv) Areas outside urban areas; (aa) Areas containing indigenous vegetation	New gravel roads are to be developed and existing roads are to be upgraded, they will be 4m in width. Compacted and covered in a layer of gravel
10	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. iii. Western Cape iv. All areas outside urban areas;	The proposed development is outside the urban area
18 (i)	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. (ii) All areas outside urban areas (aa) Areas containing indigenous vegetation;	Existing roads will be upgraded and lengthened by 5,548km

The competent authority that must consider and decide on the application for authorisation in respect of the activities listed in Table 4-1 is the Department of Environment, Forestry and Fishery(DEFF) as the proposed project is to be undertaken by an organ of state.

It is important to note that in addition to the requirements for an authorisation in terms of the NEMA, there may be additional legislative requirements which need to be considered prior to commencing with the activity. A list of applicable legislation is included in the sections below.

4.2 APPLICABLE LEGISLATION

This section describes the South African (national), provincial and municipal legislation considered during the Basic Assessment process undertaken for the proposed development.

NATIONAL

The Constitution (Act No. 108 of 1996)

This is the supreme law of the land. As a result, all laws, including those pertaining to the proposed development, must conform to the Constitution. The Bill of Rights - Chapter 2 of the

Constitution, includes an environmental right (Section 24) according to which, "*everyone has the right –*

(a) To an environment that is not harmful to their health or well-being; and

(b) To have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that–

(i) Prevent pollution and ecological degradation.

(ii) Promote conservation; and

(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.".

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *The developer has an obligation to ensure that the proposed activity will not result in pollution and ecological degradation.*
- *The developer has an obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social development.*

National Environmental Management Act (No. 107 of 1998)

The National Environmental Management Act (No.107 of 1998) (NEMA) provides for the basis for environmental governance in South Africa by establishing principles and institutions for decision-making on matters affecting the environment.

A key aspect of NEMA is that it provides a set of environmental management principles that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. Section 2 of NEMA contains principles (see Table 4-2) relevant to the proposed project, and likely to be utilised in the process of decision making by DEFF.

Table 4-2: NEMA Environmental Management Principles

(2)	Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
(3)	Development must be socially, environmentally and economically sustainable.
(4)(a)	Sustainable development requires the consideration of all relevant factors including the following: i. That the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied; ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied; iii. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
(4)(e)	Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
(4)(i)	The social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
(4)(j)	The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
(4)(p)	The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

(4)(r)	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

As these principles are utilised as a guideline by the competent authority in ensuring the protection of the environment, the proposed development should, where possible, be in accordance with these principles. Where this is not possible, deviation from these principles would have to be very strongly motivated.

NEMA introduces the duty of care concept, which is based on the policy of strict liability. This duty of care extends to the prevention, control and rehabilitation of significant pollution and environmental degradation. It also dictates a duty of care to address emergency incidents of pollution. A failure to perform this duty of care may lead to criminal prosecution and may lead to the prosecution of managers or directors of companies for the conduct of the legal persons. Employees who refuse to perform environmentally hazardous work, or whistle blowers, are protected in terms of NEMA.

In addition, NEMA introduces a new framework for environmental impact assessments, the EIA Regulations (2014 and subsequent 2017 amendments), which aims to avoid detrimental environmental impacts through the regulation of specific activities that cannot commence without prior environmental authorisation (discussed in Section 4.3).

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *An application for Environmental Authorisation (as triggered by the EIA Regulations 2014 (and subsequent 2017 amendments) will be required. In terms of Section 28, every person who causes, has caused, or may cause significant pollution or degradation of the environment, must take reasonable measures to prevent pollution or rectify the damage caused. The undertaking of various specialist studies, in order to identify potential impacts on the environment and to recommend mitigation measures to minimise these impacts, complies with Section 28 of NEMA. The developer must apply the NEMA principles, the fair decision-making and conflict management procedures that are provided for in NEMA. The developer must apply the principles of Integrated Environmental Management and consider, investigate and assess the potential impact of existing and planned activities on the environment, socio-economic conditions and the cultural heritage.*
- *In terms of the EIA regulations, the construction of the proposed radio antennae and associated infrastructure will trigger the need for a Basic Assessment process under the NEMA EIA Regulations of 2014 (and subsequent 2017 amendments) in Listing Notice 1 and Listing Notice 3 respectively (refer to Section 4.3 for a detailed description of the listed activities applied for).*
- *An application for environmental authorisations was submitted to the competent authority, in this case the Department of Environment, Forestry and Fisheries.*

National Environment Management: Biodiversity Act (No. 10 of 2004)

The National Environment Management: Biodiversity Act (No. 10 of 2004) (NEM:BA) provides for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems that warrant national protection.

The objectives of NEM:BA are:

(a) Within the framework of the National Environmental Management Act, to provide for—

(i) The management and conservation of biological diversity within the Republic and of the components of such biological diversity;
(ii) The use of indigenous biological resources in a sustainable manner; and
(iii) The fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;

(b) To give effect to ratified international agreements relating to biodiversity which are binding on the Republic;
(c) To provide for co-operative governance in biodiversity management and conservation; and
(d) To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

The Act provides for the management and conservation of South Africa's biodiversity within the framework of the NEM:BA. In terms of the Biodiversity Act, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (including The Endangered and Threatened Ecosystem Regulations, Government Notice R. 1002 dated 9th December 2011).
- Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

Table 4-3: Management and conservation of biodiversity within the framework of NEMA.

Chapter 4	• Provides for the protection of species that are threatened or in need of national protection to ensure their survival in the wild; • To give effect to the Republic's obligations under international agreements regulating international trade in specimens of endangered species; and • Ensure that the commercial utilization of biodiversity is managed in an ecologically sustainable way.
Chapter 5 (Part 2) Section 73	A person who is the owner of land on which a listed invasive species occurs must: a) Notify any relevant competent authority, in writing, of the listed invasive species occurring on that land; b) Take steps to control and eradicate the listed invasive species and to prevent it from spreading; and c) Take all required steps to prevent or minimise harm to biodiversity.
Chapter 5 (Part 2) Section 75	• Control and eradication of a listed invasive species must be carried out by means or methods that are appropriate for the species concerned and the environment in which it occurs. • Any action taken to control and eradicate a listed invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment. • The methods employed to control and eradicate a listed invasive species must also be directed at the offspring, propagating material and re-growth of such invasive species in order to prevent such species from producing offspring, forming seed, regenerating or re-establishing itself in any manner.

NEMBA's permit system is further regulated in the NEMBA Threatened or Protected Species Regulations Government Notice R. 152 of 2007. The NEMBA Alien and Invasive Species List

(Government Notice R 599 of 2014) defines Alien and Invasive species that are regulated by the NEMBA Alien and Invasive Species Regulations (Government Notice 98 of 2014).

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *There are listed species which are threatened and protected which may occur in the area, however, they are not limited to the project site, but are likely to move through the site.*
- *The construction of the proposed radio antenna may have an impact on species of conservation concern (Fauna) as there are drainage lines which occur at both sites.. These act as corridors for animals to move along and must be avoided.*
- *Loss of habitat is associated with the clearing of vegetation and must be kept to a minimum.*
- *There were 8 plant species which were listed as species of conservation concern (Schedule 4) found within the study area, but the proposed development is unlikely to have a significant impact on the surrounding vegetation.*

National Environmental Management: Waste Management Act (No. 59 of 2008)

The National Environmental Management: Waste Management Act (No. 59 of 2008) (NEM:WMA) gives legal effect to the Government's policies and principles relating to waste management in South Africa, as reflected in the National Waste Management Strategy (NWMS).

The objects of the Act are "*to protect health, well-being and the environment by providing reasonable measures for—*

- *Minimising the consumption of natural resources;*
- *Avoiding and minimising the generation of waste;*
- *Reducing, re-using, recycling and recovering waste;*
- *Treating and safely disposing of waste as a last resort;*
- *Preventing pollution and ecological degradation;*
- *Securing ecologically sustainable development while promoting justifiable economic and social development;*
- *Promoting and ensuring the effective delivery of waste services;*
- *Remediating land where contamination presents, or may present, a significant risk of harm to health or the environment; and*
- *Achieving integrated waste management reporting and planning.*"

Chapter 4 of this Act deals with the general duty in respect to waste management and emphasises that, "*a holder of waste must, within the holder's power, take all reasonable measures to:- avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated; reduce, re-use, recycle and recover waste; where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner; manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts; prevent any employee or any person under his or her supervision from contravening this Act; and prevent the waste from being used for an unauthorised purpose*".

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

The proposed project will not require a waste management license. However, the developer must ensure that:

- *All activities associated with the project address waste related matters in compliance with the requirements of the Act.*
- *The developer must ensure that waste is disposed of at a registered landfill site.*

National Environmental Management: Protected Areas Act (Act No. 57 of 2003)

The purpose of the National Environmental Management: Protected Areas Amendment Act (NEMPAA) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.

The objectives of NEMPAA are:

(a) To provide, within the framework of national legislation, including the National Environmental Management Act, for the declaration and management of protected areas;
(b) To provide for co-operative governance in the declaration and management of protected areas;
(c) To effect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity;
(d) To provide for a representative network of protected areas on state land, private land and communal land;
(e) To promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;
(f) To promote participation of local communities in the management of protected areas, where appropriate; and
(g) To provide for the continued existence of South African National Parks.

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *None of the proposed sites fall within a protected area.*
- *In addition, the proposed project does not fall within any National Protected Expansion Areas as per NPAES (2008).*

National Heritage Resources Act (No. 25 of 1999)

The National Heritage Resources Act protects archaeological and palaeontological sites and materials, as well as graves/cemeteries, battlefield sites and buildings, structures and features over 60 years old. The South African Heritage Resources Agency (SAHRA) administers this legislation nationally, with Heritage Resources Agencies acting at provincial level.

According to the Act (Section 35), it is an offence to destroy, damage, excavate, alter or remove from its original place, or collect, any archaeological, palaeontological and historical material or object, without a permit issued by the South African Heritage Resources Agency (SAHRA) or applicable Provincial Heritage Resources Agency, viz. Heritage Western Cape (HWC). Notification of SAHRA or the applicable Provincial Heritage Resources Agency is required for proposed developments exceeding certain dimensions (Section 38(1)).

- **RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE***The South African Heritage Resources Agency (SAHRA) and applicable Heritage Western Cape (HWC) have been informed of the project.*
- *No material or object of Palaeontological or Archaeological significance has been discovered on either site*

- *The site is in close proximity to a National Heritage site and a scenic route, the proposed development therefore has bearing on the sense of place.*

Occupational Health and Safety Act (No. 85 of 1993)

The objective of this Act is to provide for the health and safety of persons at work. In addition, the Act requires that, "*as far as reasonably practicable, employers must ensure that their activities do not expose non-employees to health hazards*". The importance of the Act lies in its numerous regulations, many of which will be relevant to the proposed project. These cover, among other issues, noise and lighting.

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *The developer must be mindful of the principles and broad liability and implications contained in the OHSA and mitigate any potential impacts.*

Aviation Act (No. 74 of 1962): 13th Amendment of the Civil Aviation Regulations 1997

Any communications structure, building or other structure, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace, or has the potential to interfere with the operation of navigation or surveillance systems or Instrument Landing Systems, including meteorological systems for aeronautical purposes, is considered an OBSTACLE and shall be submitted to the Commissioner for Civil Aviation for evaluation (refer SA-CAR Part 139.01.33)

Also applicable is Part 91.01.10 of the CAR of 1997 - endangering safety:

"*No person shall, through any act or omission endanger the safety of an aircraft or person therein, or cause or permit an aircraft to endanger the safety of any person or property*".

Masts, Towers and Radio Antennae are considered as obstacles and the detail shall be communicated to the Commissioner at an early planning stage. There is also the risk of interference with communications and instruments of air crafts.

The Commissioner may require that supporting towers be marked and lighted.

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

Due to requirements of the Act to ensure the safety of aircrafts, the developer must engage directly with the Civil Aviation Authority regarding the structural details of the facility.

- *The CAA has been notified of the project.*
- *Where necessary the above-mentioned design specifications will be in the design by the developer.*

National Water Act (No. 36 of 1998)

The National Water Act (NWA) provides for fundamental reform of the law relating to water resources in South Africa.

The purpose of the Act is "*to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors–*

(a) Facilitating social and economic development;
(b) Protecting aquatic and associated ecosystems and their biological diversity;
(c) Reducing and preventing pollution and degradation of water resources;
(d) Managing floods and droughts."

Section 21 of the NWA describes activities defined as a water use under the Act. These activities may only be undertaken subject to the application for, and issue of, a Water Use License (WUL) or General Authorisation (GA). Water use activities include—

(a) Taking water from a water resource;
(b) Storing water;
(c) Impeding or diverting the flow of water in a watercourse;
(d) Engaging in a stream flow reduction activity contemplated in section 36;
(e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
(f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
(g) Disposing of waste in a manner which may detrimentally impact on a water resource;
(h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
(i) Altering the bed, banks, course or characteristics of a watercourse;

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *There may be certain instances where the developer will be required to construct access roads and fences over watercourses and drainage channels. In this case, the developer will need to obtain approval in terms of Section 21 (c) and (i) of the National Water Act.*

Subdivision of Agricultural Land Act (No. 70 of 1970)

The Subdivision of Agricultural Land Act (No. 70 of 1970) controls the subdivision of all agricultural land in South Africa and prohibits certain actions relating to agricultural land. In terms of the Act, the owner of agricultural land is required to obtain consent from the Minister of Agriculture, Forestry and Fisheries in order to subdivide agricultural land.

The purpose of the Act is to prevent uneconomic farming units from being created and degradation of prime agricultural land. The Act also regulates leasing and selling of agricultural land as well as registration of servitudes.

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *Approval may be required from the Department of Environment, Forestry and Fisheries (DFF) for any activities on the land zoned for agriculture and any proposed rezoning or sub-divisions of agricultural land.*
- *DEFF has been notified of the proposed application.*

National Road Traffic Act (No. 93 of 1996)

The National Road Traffic Act (No. 93 of 1996) (NRTA) provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNAE

- *All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed sub-transmission line.*

Other Relevant National Legislation

Other legislation that may be relevant to the proposed sub-transmission line includes:

- The Environment Conservation Act No 73 of 1989 (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters;
- The Telecommunication Act (1966) which has certain requirements with regard to potential impacts on signal reception;
- Provincial Nature and Environmental Conservation Ordinance (No. 19 of 1974), which lists species of special concern which require permits for removal. Schedules 1 to 4 list protected and endangered plant and animal species.
- Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013 – came into force on 1 July 2015) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act.

PROVINCIAL

The Nature and Environmental Ordinance 19 of 1974, (as amended by the Western Cape Nature Conservation Laws Amendment Act, Act 2 of 2000)

The Nature and Environmental Ordinance 19 of 1974, (as amended by the Western Cape Nature Conservation Laws Amendment Act, Act 2 of 2000) defines the protection status of plants as follows:

- ‘‘*Endangered Flora*’’ means flora of any species which is in danger of extinction and is specified in Schedule 3 or Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973; provided that it shall not include flora of any species specified in such Appendix and Schedule 4; (therefore all Schedule 3 species)
- ‘‘*Protected Flora*’’ means any species of flora specified in Schedule 4 or Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, Washington, 1973; provided that it shall not include any species of flora specified in such Appendix and Schedule 3
- ‘‘*Indigenous Unprotected Flora”* means any species of indigenous flora not specified in Schedule 3 or 4.

RELEVANCE TO THE PROPOSED CONSTRUCTION OF RADIO ANTENNEA

- *The developer must not cause damage to any endangered ecosystems and must protect and promote biodiversity;*
- *The developer must assess the impacts of the proposed development on endangered ecosystems;*
- *The developer may not remove or damage any protected species without a permit; and*
- *The developer must ensure that the site is cleared of alien vegetation using appropriate means.*

OTHER

In addition to the above, aside from the environmental authorisation, there are other permits, contracts and licenses that will need to be obtained by the project proponent for the proposed project some of which fall outside the scope of the BA. However, for the purposes of completeness, these include:

- Western Cape Land Use Planning Act (No. 3 of 2014)
- Laingsburg Local Municipality Land Use Planning Act
- District and Local municipality Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs).

In addition to the above, the following spatial planning tools need to be taken into consideration:

- The South African Vegetation Map (Mucina and Rutherford);
- Western Cape Biodiversity Spatial Plan

5 PUBLIC PARTICIPATION

Public consultation is a legal requirement throughout the EIA process. Developers are required to conduct public consultation throughout the Basic Assessment process. Formal BA documents are required to be made available for public review, which include the project brief, Draft and Final BARs, and the decision of the Competent Authority.

5.1 PUBLIC PARTICIPATION PROCESS

According to Regulation 41(2) of the NEMA EIA Regulations 2014 (and subsequent 2017 amendments) "*The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by*:

SITE NOTICE

(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of—
(i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
(ii) Any alternative site.

During the initial site visit, two site notices (one English and one Afrikaans) were placed on site at the only entry point of the property (see Appendix F1 for proof of placement). The English and Afrikaans site notice were placed alongside one another at the following location.

Sign Number	Coordinates
Sign 1 & 2	32˚ 13’ 41.5 ‘’ S, 20˚ 34’39.98’’ E

I&AP AND STAKEHOLDER NOTIFICATIONS

(b) Giving written notice, in any of the manners provided for in section 47 D of the Act, to—
- *(i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, and to any alternative site where the activity is to be undertaken;*
- *(ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- *(iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
- *(iv) The municipality which has jurisdiction in the area;*
- *(v) Any organ of state having jurisdiction in respect of any aspect of the activity; and*
- *(vi) Any other party as required by the competent authority;*

Formal I&AP notifications were sent out via email, registered mail and telephonically (all notification proofs are provided in Appendix F6 and F7.

Contact details of all stakeholders identified (I&AP list) are available in Appendix F3. All I&APs will be notified of the availability of this Draft BAR for public review by means of email, registered mail and telephonically (all notification proofs will be attached to the final BAR.

NEWSPAPER ADVERTISEMENT

(c) Placing an advertisement in—
- *(i) One local newspaper; or*
- *(ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;*

(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii);

Newspaper advertisements will be placed in the Die Burger to reach the areas beyond Matjiesfontein, such as Laingsburg in order to notify the general public of the proposed development and availability of the Draft BAR for public review. Proof of placement will be provided in the Final BAR.

STAKEHOLDER IDENTIFICATION AND REGISTERED I&APS

A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of—

> *(a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;*
> *(b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and*
> *(c) All organs of state which have jurisdiction in respect of the activity to which the application relates.*

A comprehensive I&AP register has been included in Appendix F3 of this report.

ISSUES RAISED BY I&APS

> *The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and recordings of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these regulations.*

To date, no formal comments or issues have been raised by I&APs regarding the proposed construction of Radio Antennae. A full Issues and Response Trail (IRT) will be attached to the final BAR should any comments be provided during the 30-day mandatory PPP period upon circulation of the Draft BAR.

6 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This chapter provides a description of the affected environment within the vicinity of the proposed development. This information is provided to assist the reader in understanding the possible impacts of the project on the environment within which it is proposed to be developed. This information has been sourced from both existing information available for the area as well as the specialist consultants who have undertaken studies for the proposed construction of the radio antennae. This chapter aims to provide the context within which this BA is being conducted.

6.1 BIOPHYSICAL ENVIRONMENT

6.1.1 Climate

Matjiesfontein, near Laingsburg in the Klein Karoo, has a semi-arid desert climate. This is characterised by areas receiving approximately 185mm of annual rainfall concentrated in the winter months. The chart below shows the average rainfall values for Matjiesfontein per month (Figure 6-1).

During the hottest months, which span from November to March, the average temperature is between 15˚C and 30˚C and in the winter months, extending from May through August, the average temperature ranges between 1˚C and 16˚C. The mean annual temperature in Matjiesfontein is 15.4 °C.

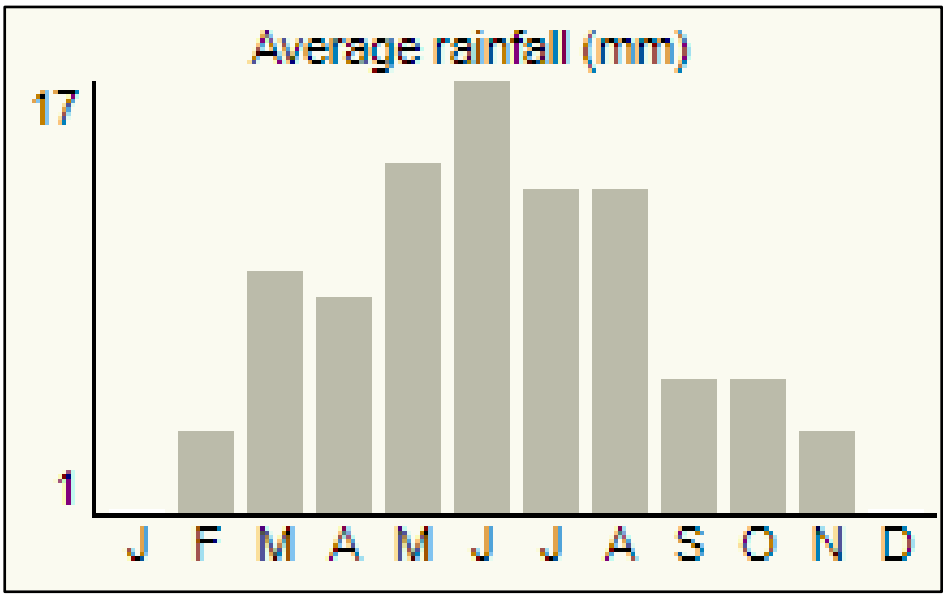


Figure 6-1 Matjiesfontein monthly average rainfall

6.1.2 Topography

On the northern side, closest to the N1 and approximately 3.3km from Matjiesfontein village, is Site A (Figure 6-2). This area slopes gradually upward to the west from 946m to 971m over 1,1km's, with a few undulating hills or "koppies" and the presence of rocky outcrops. There is a slope which descends slightly to the south, from 970m on the northern boundary of the site, to 955m in the centre of the site (non-perennial river) rising up again to 965m toward the southern edge.

Approximately 3km from Matjiesfontein, behind a ridge averaging 40m in height (from ground level) and located within the margins of the Cape Fold Belt on the northern side of the Witberg Range, is Site 1 (Figure 6-2). The area is something of an enclosed valley and fairly level, ascending to the south.

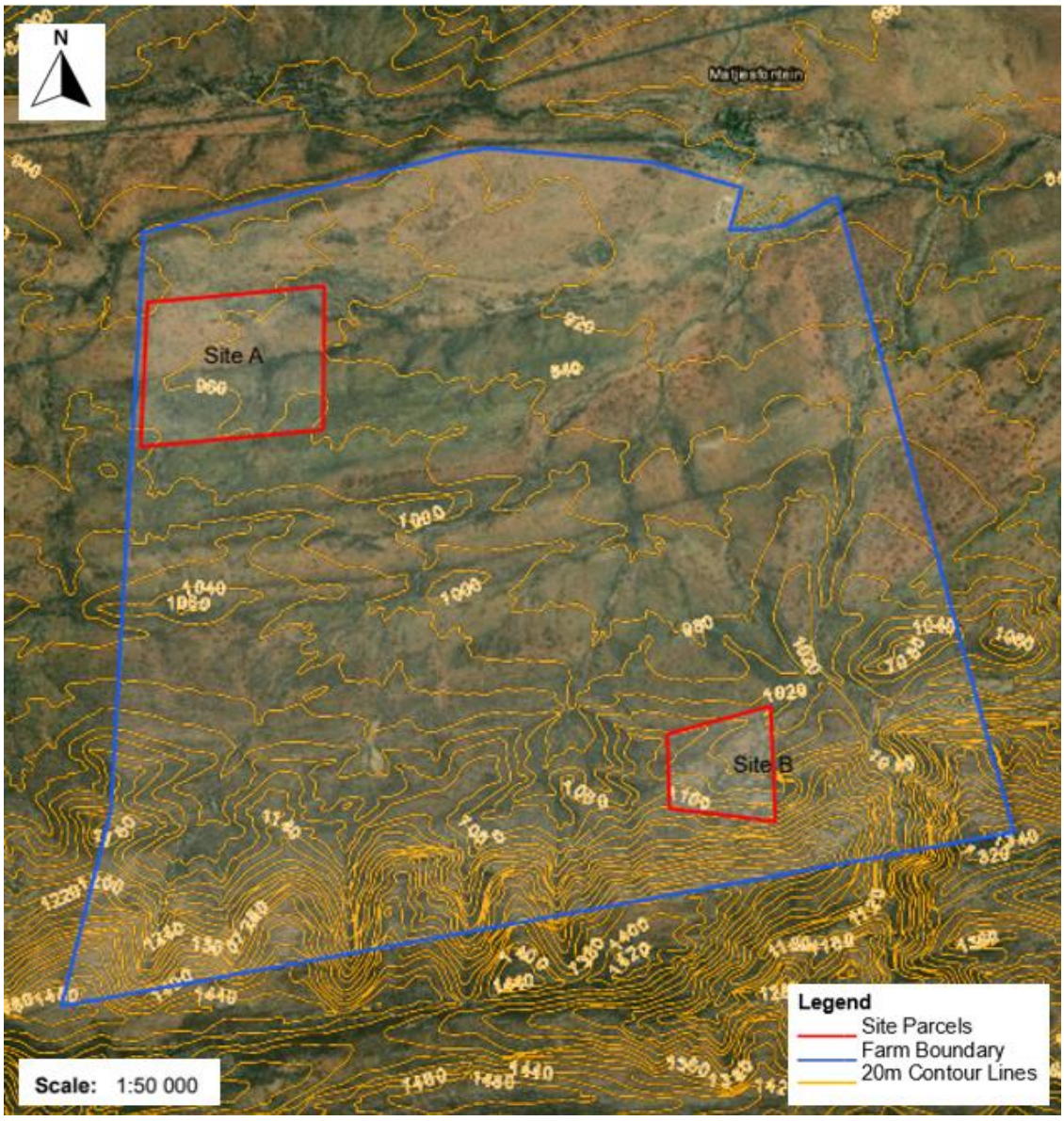


Figure 6-2 Site topography

6.1.3 Geology

The two small proposed project areas are underlain by potentially-fossiliferous Palaeozoic sediments of the Witteberg and Dwyka Groups (Cape and Karoo Supergroups, respectively) and are located within the margins of the Cape Fold Belt on the northern side of the Witberg Range (Almond, 2020).

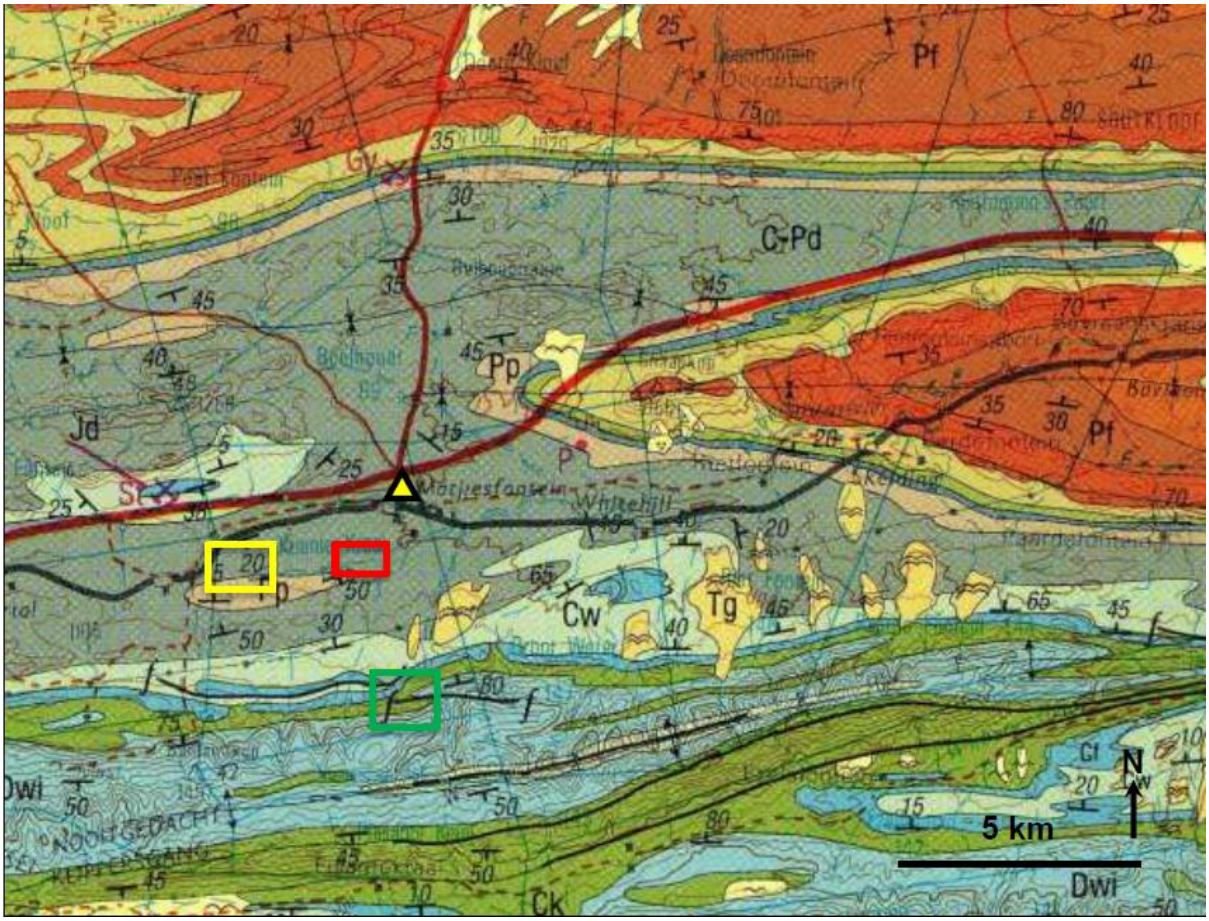


Figure 6-3: Site A (yellow rectangle) and Site B (Green rectangle) and alternative site assessed (Red rectangle) overlaid on extract from 1: 250 000 geological map sheet 3320 Ladismith (Council for Geoscience, Pretoria)

6.1.3.1 Geology of Site A (Alternative 2/ Preferred Alternative)

The yellow, parallelogram-shaped polygon, referred to as Site A (Alternative 2) is approximately one square kilometer in area and situated less than a kilometer west of Alternative Site 1(red rectangle) on the western boundary of Farm 148 (Koenie Kraal) (Figure 6-3 above) It shares several topographical and geological features with the latter area. It comprises gently sloping to low hilly terrain rising up to 952 m amsl in the northeast . The area is dissected by a dendritic network of shallow incised streams with vegetated margins, tributaries of the Baviaansrivier system, the largest of which runs west to east across the area's midline. Several low, rocky outcrops occur in both northern and southern sectors while in the intervening areas bedrock exposure is for the most part limited to stream beds and erosion gullies; the majority of the area is mantled by gravelly soils, sandy to gravelly alluvium and colluvial debris as well as typical karroid dwarf *bossieveld* vegetation.

The preferred Site**, Site A/Alternative 2**, situated in gentle hilly terrain some 3.3 km SW of Matjiesfontein Village, is underlain in the north by poorly-exposed Dwyka Group tillites with occasional esker sandstone outcrops and exposures of thin-bedded dropstone laminates along the axial stream bed. The southern half of the site overlies weathered, tabular-bedded basinal marine and possible lower shoreface sediments of the Prince Albert Formation (Ecca Group) that include a zone of large, lenticular to tabular phosphatic concretions.
During the field survey no trace or body fossils were recorded either within the Dwyka or Ecca Group bedrocks or the overlying unconsolidate

Figure 6-4: Lichen-patinated low exposures of cleaved, clast-poor Dwyka tillite building E-W ridges in the NE corner of Area A.

6.1.3.2 Geology of Site B

The more southerly site, referred to as Site B, comprises a topographically varied area of rocky to rubbly terrain between 1040 to 1160 metres above sea level on the northern flank of the Witberge Range. The deeply-incised Perdekloof gorge is situated less than one kilometre to the east. The site is underlain by coastal to shelf sediments of the Witpoort Formation and Lake Mentz Subgroup of the Witteberg Group (Cape Supergroup) that are Late Devonian to Early Carboniferous in age.

Site B lies within a tectonically-complex, intensely-folded and probably faulted zone embedded in the rugged foothills of the Witberg Range. Bedrocks of the Late Devonian to Early Carboniferous Witteberg Group (Cape Supergroup) represented here include highlyresistant, clean-washed quartzites of the Witpoort Formation, the recessive-weathering, mudrockdominated Kweekvlei Formation and overlying prominent-weathering, cross-bedded, pebbly sands of the Floriskraal Formation (The presence of younger Waaipoort Formation mudrocks and wackes here is equivocal). The Witpoort and Floriskraal arenites are of low palaeosensitivity, having only yielded sparse reworked vascular plant debris, low-diversity

trace fossil assemblages and rare fish remains in the Matjiesfontein region and elsewhere. The Kweekvlei mudrocks in the study area are poorly-exposed, highly-weathered as well as fractured near-surface and show zones of intense soft-sediment and / or tectonic deformation. Good Witteberg Group bedding plane exposures are not seen and no fossils were recorded at this site. Most of Site B is covered by a thick (1 m or more) blanket of coarse, rubbly and partially-ferruginised quartzitic gravels and sands of both colluvial and alluvial origin which are generally of low palaeontological sensitivity. It is noted, however, that well-preserved Holocene elephant remains are known from comparable deposits near Laingsburg.

6.1.4 Watercourses and Wetlands

The desktop analysis of hydrological features was based largely on the data from the National Biodiversity Assessment (NBA) (2018) as it incorporates the data of the NFEPA project and the SAIIAE. According to the NBA (2018) (and NFEPA, 2014), there are a number of non-perennial streams surrounding the study site, although there are no identified streams within the boundary of Site A or Site B.

The study area falls within quaternary catchment J11E within Water Management Area 16 (Gouritz). It does not fall within a Strategic Water Source Area. The mean annual run-off for this region is 3.99 mm per annum.

South Africa is a geologically, geomorphologically, climatically and ecologically complex country, and this has resulted in a diverse range of ecosystems, including rivers. River ecoregional classification or typing allows the grouping of rivers according to similarities based on a top-down nested hierarchy. The principle of river typing is that rivers grouped together at a particular level of the typing hierarchy will be more similar to one another than rivers in other groups. Ecological regions are regions within which there is relative similarity in the mosaic of ecosystems and ecosystem components (biotic and abiotic, aquatic and terrestrial).

According to Department of Water Affairs and Forestry (2005) Level 2 River Ecoregional Classification System, the project site falls within Level 2 Ecoregion Great Karoo. This ecoregion is characterised by plains with low to moderate relief although significant closed hills and mountains with moderate to high relief are present (Kleynhans *et. al.*, 2007). Vegetation types typically include Nama Karoo, Succulent Karoo, Renosterveld and Thicket.

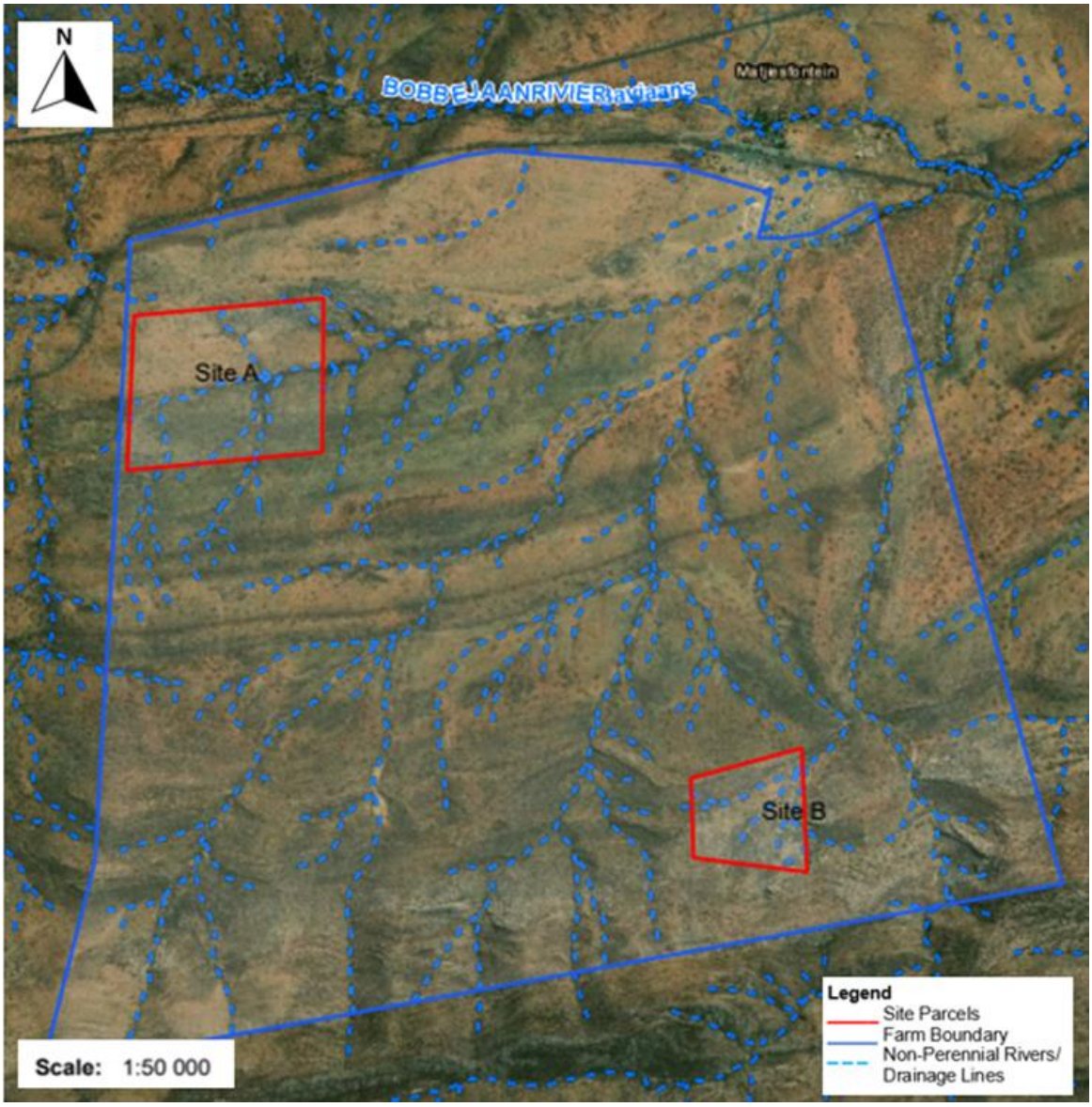


Figure 6-5:Watercourses, tributaries and drainage lines within the project site indicated by the Blue dotted lines(Source, Cape Farm Mapper)

Site A has a non-perennial tributary of the Bobbejaanrivier that dissects the site from west to east. This stream flows from an elevation of 968m to 945m and feeds into the Bobbejaanrivier approximately 4km away (Figure 6-5). There are four drainage lines that feed into the tributary. These non-perennial systems will only have water for a few months of the year during high rainfall events.

There were four shallow drainage lines perpendicular to the tributary. These drain from the higher slopes, down towards the tributary. The species associated with these drainage lines were typical of species found throughout the site, though the plants themselves were generally taller suggesting they benefit from slightly more water(Plate 6-1)

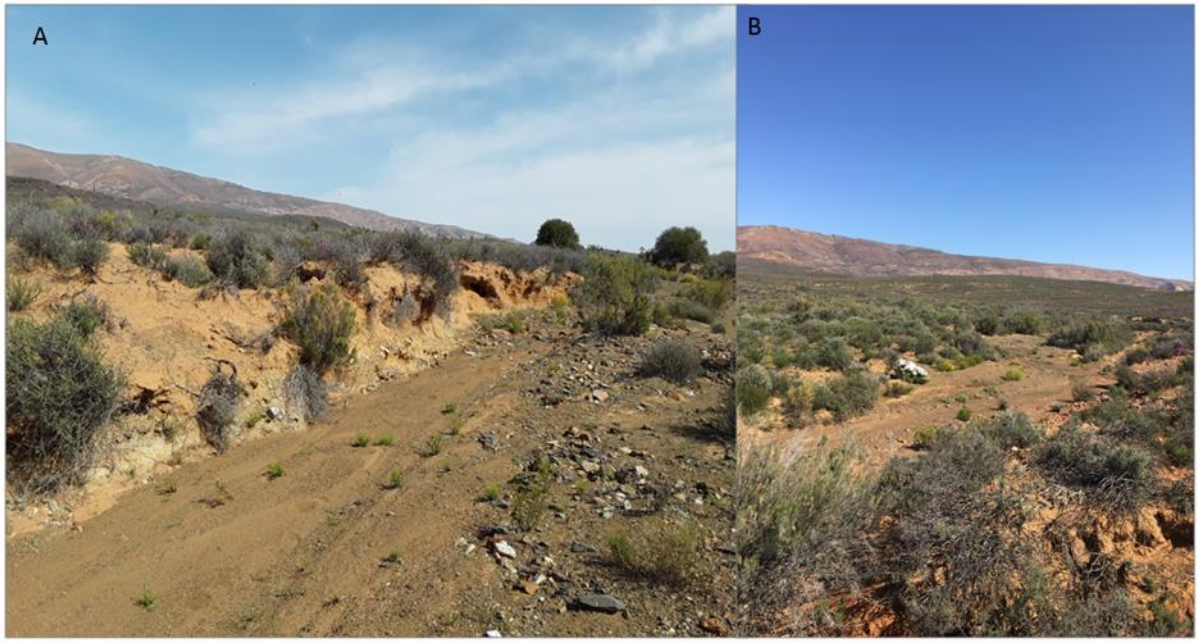


Plate 6-1: Tributary that dissects Sita A

Site B is characterised by the presence of 3 drainage lines flowing from the slopes on the outer boundaries of the site at elevations of between 1160 to 1060 from the western, northern and north easterly, converging towards the north east boundary and continuing their confluence in a northerly journey to eventually drain into the Bobbejaanrivier Like the Bobbejaanrivier, these drainage lines also only have water during the wet season (Figure 6-7)

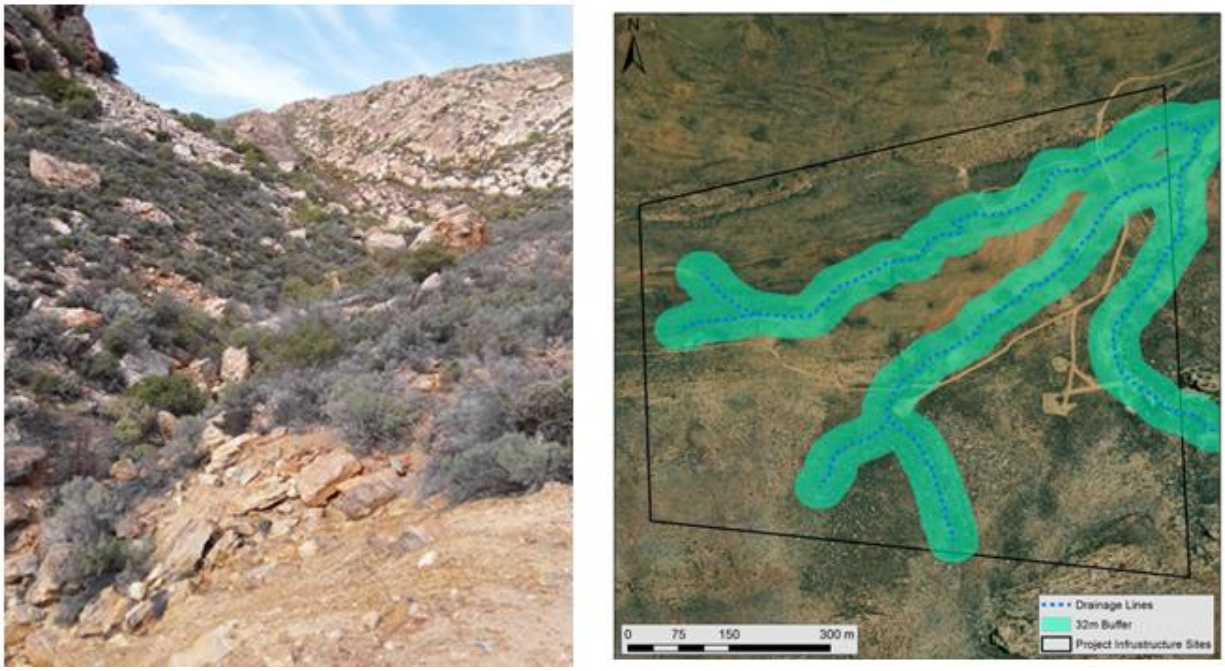


Figure 6-6: Photograph taken of a drainage line at Site B (left) and mapped with a 32m development restriction buffer(right)

The only direct impacts expected to occur to the non-perennial tributary at site A is the where the fence will cross the stream. There may also be some minor drainage lines that are crossed by the fence and road. Additionally, an increase in impervious surface area will result in increased surface runoff during rainfall events, which, together with uncontrolled stormwater runoff into nearby streams could lead to erosion, sedimentation and deterioration of instream water quality/habitat should the runoff be contaminated.

The Present Ecological State (PES 1999) of Bobbejaanrivier is classified as Class C: Moderately Modified with an Environmental Threat Status (ETS) of Least Threatened (NBA, 2018).

All the drainage lines within Site A and Site B have been designated as Ecological Support Areas (ESA) (WCBSP, 2017).

According to the NBA (2018) (and NFEPA, 2014), no natural wetlands occur within site A or site B.

6.2 CRITICAL BIODIVERSITY AREAS

The Western Cape Biodiversity Spatial Plan is a tool that identifies priority areas of biodiversity and provides land use guidelines for developers. Based on the available spatial tool, Site A and B both fall within an Ecological Support Area 1 (ESA1) and Other Natural Area (Figure 6-1).

ESA1's are functional areas that are considered to be in a natural, near-natural or moderately degraded condition and are defined as "areas that are not essential for meeting biodiversity targets, but that play an important role in supporting the functioning of PAs or CBAs, and are often vital for delivering ecosystem services." (WCBSP, 2017). The land use guidelines associated with these areas are to "maintain in a functional, near natural state. Some habitat loss is acceptable, provided the underlying biodiversity objectives and ecological functioning are not compromised". The ESA1 areas at both sites are associated with drainage lines. Other than fences and road crossings, these areas will be avoided.

Other Natural Areas are areas that have "been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructure functions. Although they have not been prioritised for biodiversity, they are still an important part of the natural ecosystem." The land use guidelines associated with these areas are to "Minimise habitat and species loss and ensure ecosystem functionality through strategic landscape planning. Offers flexibility in permissible land uses, but some authorisation may still be required for high-impact land uses". The majority of each site is considered as "Other Natural Areas" (Figure 6-1).

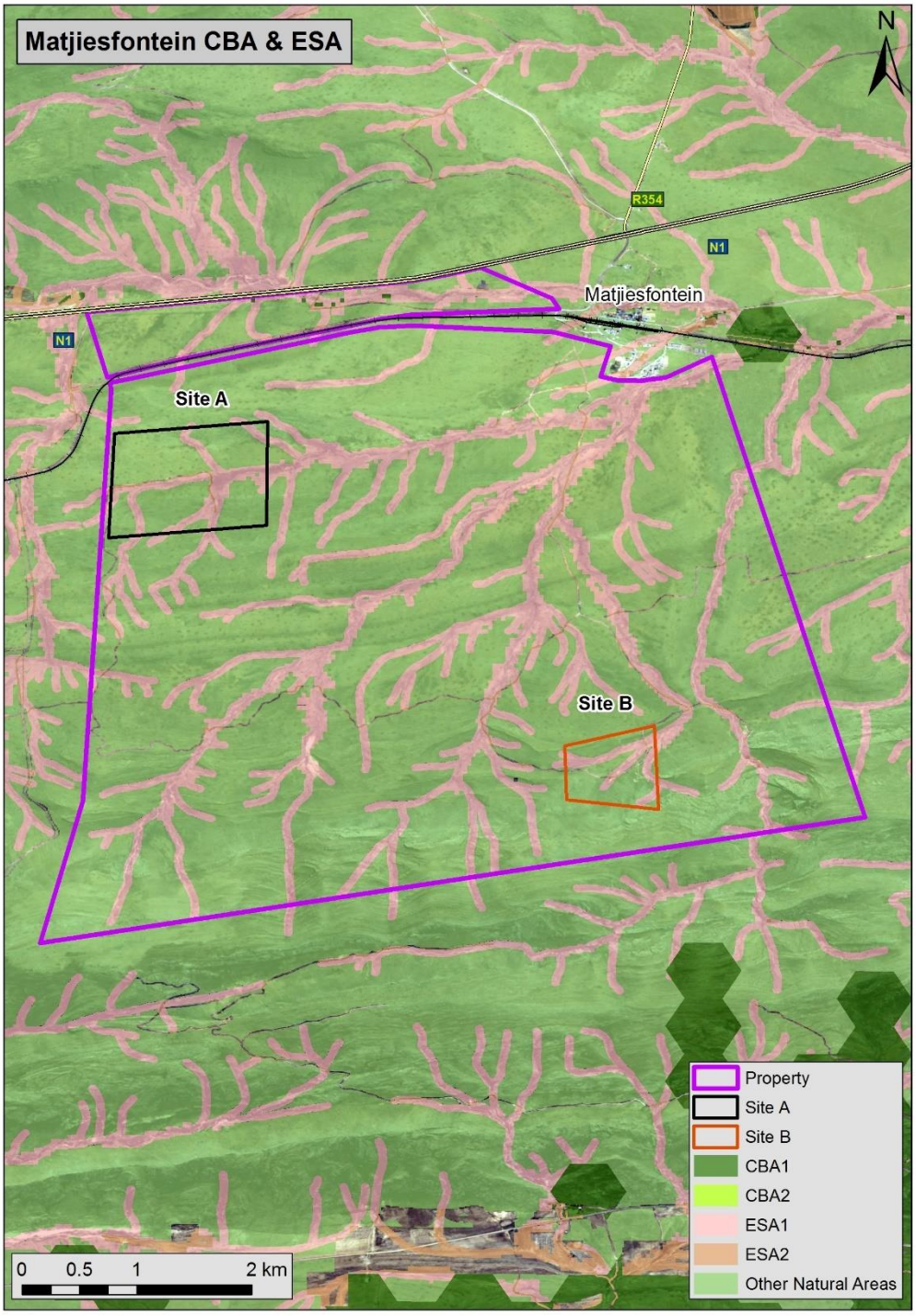


Figure 6-6-7: Critical Biodiversity Map for the study area

6.3 VEGETATION AND FLORISTICS

The study area is part of the Succulent Karoo Biome, which is located in the more arid areas of the country, and is characterised by the presence of succulent species primarily from the Aizoaceae, Crassulaceae and Euphorbiaceae families. The vegetation on the site is classified as Renosterveld, which is generally found on nutrient-rich soils. The dominant

characteristic shrubs belong to the Genera *Eriocephalus* and *Elytropappus*, but grass and bulbous geophytes species are also abundant (WCBSP, 2017).

6.3.1 National Vegetation Map: Expected Vegetation Types

Mucina and Rutherford (2006) developed the National Vegetation map as part of a South African National Biodiversity Institute (SANBI) funded project: "It was compiled to provide floristically based vegetation units of South Africa, Lesotho and Swaziland at a greater level of detail than had been available before." The map was developed using a wealth of data from several contributors and has allowed for the best national vegetation map to date, the last being that of Acocks developed over 50 years ago. This project had two main aims:

- to determine the variation in and units of southern African vegetation based on the analysis and synthesis of data from vegetation studies throughout the region, and
- to compile a vegetation map. The aim of the map was to accurately reflect the distribution and variation on the vegetation and indicate the relationship of the vegetation with the environment. For this reason the collective expertise of vegetation scientists from universities and state departments were harnessed to make this project as comprehensive as possible.

The map and accompanying book describes each vegetation type in detail, along with the most important species including endemic species and those that are biogeographically important. This is the most comprehensive data for vegetation types in South Africa. According to the map, three vegetation types are expected to occur here (Figure 6-8), namely:

- Matjiesfontein Shale Renosterveld
- Matjiesfonein Quartzite Fynbos
- Koedoesberge-Moordenaars Karoo

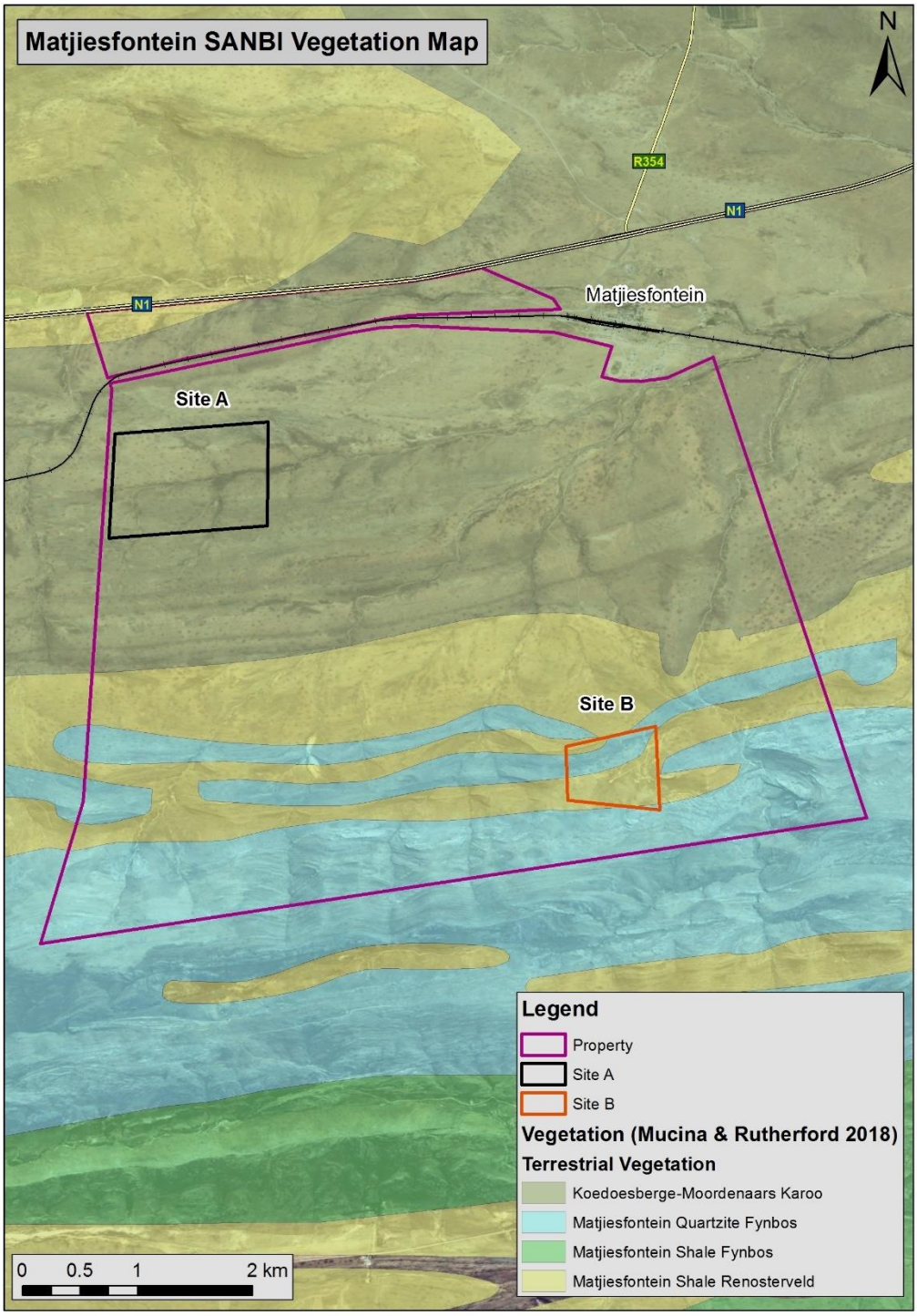


Figure 6-8:National Vegetation Map (Mucina and Rutherford 2017)

Although three vegetation types were expected to occur within the project site, only two vegetation types were recorded on site during the field survey. These are Matjiesfontein Shale Renosterveld (Site B) and Koedoesberge-Moordenaars Karoo (Site A).

6.3.2 Koedoesberge-Moordenaars Karoo

This vegetation type can be found in both the Western Cape and in smaller portions of the Northern Cape, specifically koedoesberge and Pienaar se Berg low mountain ranges bordering on the southern Tanqua Karoo, and separated by the Klein Roggeveld Mountains from the Moordenaars Karoo in the broad area of Laingsburg and Merweville (Mucina and Rutherford, 2006).

This vegetation type is associated with a slightly undulating to hilly landscape covered by low succulent scrub and dotted by scattered tall shrubs, with patches of 'white' grass visible on plains. The most conspicuous dominant species are the dwarf shrubs of the genera*Pteronia*, *Drosanthemum* and *Galenia*

Koedoesberge-Moodenaars Karoo is listed as Least Threatened with a conservation target of 19%. Only a small portion has been statutorily conserved in the Gamkapoort Nature Reserve. Little transformation has taken place and no serious alien plants are recorded within this vegetation type (Mucina and Rutherford, 2006)

6.3.3 Matjiesfontein Shale Renosterveld

The site located further up the slope (Site B) was characteristic of Matjiesfontein Shale Renosterveld as it was dominated by *Elytropappus rhinocerotis* (Renosterbos) and *Aristida diffusa* and not by fynbos species typical of Matjiesfontein Quartzite Fynbos, which was the vegetation type expected to be on site based on the National Vegetation map. Although there was overlap with species at Site A, this site had fewer succulent species. *Rhus crenata* and *Restio* species were also present within the drainage line that runs through the proposed site

This vegetation type occurs in the Western Cape Province from De Doorns and the top of the Theronsberg Pass in the west to Gamka Poort in the east. It remains north of the Waboomberg and Warmwaterberg in the Little Karoo, and north of the Anyberg and Groot Swartberg and south of Tanqua karoo, the Grootrivier near Matjiesfontein and Floriskraal Dam south east of Laingsburg. This vegetation type is associated with higher elevation ridges of Matjiesfontein Quartzite Fynbos and Matjiesfontein Shale Fynbos, which occur at altitudes between 750-1300m (Mucina and Rutherford, 2006).

This vegetation type is characterised by low mountains, parallel hills and mid-altitude plateaus supporting low, open to medium dense shrubland dominated (Mucina and Rutherford, 2006).

Matjiesfontein Shale Renosterveld is listed as least threatened with a conservation target of 27%. Approximately 7% has been conserved in the Anysberg Nature Reserve (CapeNature) and private conservation areas such as Rooikraans. An estimated 9% of this vegetation type has been completely transformed due to cultivation (Mucina and Rutherford, 2006).
Both vegetation types were typically intact and in good condition with little evidence of disturbance or invasion by alien species.

6.3.4 Plant Species of Conservation Concern

The indigenous plant species recorded at the site were compared to the South African Red Data List, the Threatened and Protected Species list and the Provincial Nature Conservation Ordinance Act (PNCO) (No. 19 of 1974). Eight Schedule 4 specie were recorded within the study area. These are listed in Table 6-1.

Table 6-1: Species of Conservation Concern recorded on site

Species	SA Red Data List	TOPS	PNCO (1974)
Babiana cf sambucina subsp.sambucina	Least Concern	-	Schedule 4
Diascia hexensis	Least Concern	-	Schedule 4
Geissorhiza heterostyla	Least Concern	-	Schedule 4
Gladiolus venustus	Least Concern	-	Schedule 4
Haworthia mucronata	DDT	-	Schedule 4
Holothrix aspera	Least Concern	-	Schedule 4
Ixia sobolifera	Least Concern	-	Schedule 4
Ixia sp.	Least Concern	-	Schedule 4

Babiana cf sambucina subsp. sambucina
Babiana sambucina subsp. sambucia occurs in the Western and Eastern Cape from Ceres through to Port Elizabeth and is associated with the Klein Karoo. This species is endemic to South Africa and although listed as a Schedule 4 species on the PNCO as a consequence of it belonging to the Iris family, it is listed as Least Concern on the South African Red Data List due to its population being stable.

Diascia hexensis
This species is endemic to South Africa and occurs in the Klein Karoo in the Western and Northern Cape. It has been assigned an automatic status of Least Concern until the Threatened Species Programme has completed a full assessment of the taxon's status. This species was listed as a Schedule 4 species on the PNCO list.

Geissorhiza heterostyla
Geissorhiza heterostyla is a South African endemic occurring from south-eastern-namaqualand to the southern Cape and eastwards to Port Elizabeth. This species is listed on the PNCO list as a consequence of it falling in the Iridaceae family. It is listed as Least Concern on the South African Red data List.

Gladiolus venustus
This species is endemic to South Africa and occurs in the Klein Karoo in the Western and Northern Cape. It has been assigned an automatic status of Least Concern until the Threatened Species Programme has completed a full assessment of the taxon's status. This species was listed as a Schedule 4 species on the PNCO list.

Haworthia mucronata
This species has not yet been evaluated by the Threatened Species Programme however it is listed as a Schedule 4 species on the PNCO list.

Holothrix aspera
This species is endemic to South Africa and occurs in the Northern and Western Cape(Kurzwell and Victor, 2005). It is described as having a stable population and although it

is listed as Schedule 4 on the PNCO list as a consequence of it falling within the Orchidaceaefamily, it is listed as Least Concern on the South African Red Data List.

Ixia sobolifera cf. subsp. sobolifera
This species is a South African endemic occurring in the Northern and Western Cape. This species is listed as Least Concern on the South African Red Data List as there are no significant threats to this taxon. This species is listed as a Schedule 4 species on the PNCO as it falls within the Iridaceae family.

A full species list is available in Appendix A of the ecological report.

6.3.5 Alien Plant Species

No alien plant species were recorded within either Site A or site B. However, disturbance to the environment associated with construction activities may result in the infestation of alien or weedy species which could be detrimental to the vegetation types present. As such, the site will need to be monitored for alien species and corrective action taken if alien species are found.

6.4 FAUNA

6.4.1 Regional Context of the Fauna

South Africa is a diverse country, with approximately 1,663 terrestrial vertebrate faunal species of which 850 species are birds, 343 species are mammals, 350 species are reptiles and 120 species are amphibians spread across seven biomes and 122 million km². The Western Cape Province is home to approximately 153 reptile species, 55 amphibian species, 172 mammal species and 674 bird species (Turner, 2017).

6.4.2 Reptiles

Of the 153 reptile species that occur in the WC, 62 species have a distribution which coincides with the project area (Appendix 1D of the ecological report) (Turner & de Villers, 2017). Approximately 44 of these species have been recorded in QDS 3320BA and 3320BC within which the site is located, including 26 lizard species, 15 snake species, two tortoise and one terrapin species (FitzPatrick, 2019). Species presence confirmed on site include the Parrot-beaked Tortoise and the Southern Tent Tortoise and neighbouring the site includes the Puff adder, Cape cobra, Southern rock agama, Bibrons thick-toed gecko, Spotted sand lizard, Buchell's sand lizard and Cape Crag lizard (iNaturalist, 2019). At a site 20-40km north of Matjiesfontein Todd (2016) recorded Karoo Tent Tortoise, Angulate Tortoise, Marsh Terrapin, Puff Adder, Karoo Girdled Lizard, Southern Rock Agama, Cape Skink and Cape Cobra on-site or in the immediate area.

The WC supports 21 threatened or near-threatened reptile species and 22 endemic reptile species (Bates *et al*., 2014; Turner & Villiers, 2017). The project area intersects the distribution of one Near-threated species the Karoo Dwarf Tortoise (*Homopus boulengeri*) and four

endemic species namely the Little Karoo Dwarf Chameleon (*Bradypodion gutturale*), Dwarf Girdled Lizard (*Cordylus minor*), Graceful Crag Lizard (*Hemicordylus capensis*) and the Red Adder (*Bitis rubida*).

Karoo Dwarf Tortoise usually take shelter under rocks in vegetated areas or in rock crevices in dwarf shrubland that often contains succulent and grassy elements. The Little Karoo Dwarf Chameleon inhabits Fynbos, Renosterveld and Fynbos–Succulent Karoo transition zone (Tolley, 2018), there is Matjiesfontein Shale Renosterveld occurs on site thus this species could occur on site since habitat is available and 6 individuals have been found within 30km^2 radius of the site (FitzPatrick, 2018). The Graceful Crag Lizard shelters in small, vertical cracks in rock outcrops in lowland areas as well as on mountain slopes (Branch 1998). Red Adder shelters under rock slabs on the slopes or tops of mountains on rocky mountain slopes in Renosterveld (Maritz & Turner, 2018). Habitat is available for both *H. capensis* and *B. rubica* at Site A and Site B. The Dwarf Girdled Lizard is found in small, diffuse colonies on high mountain tops and slopes where wary individuals run about on smooth, often vertical slopes, sheltering in rock cracks and crevices (Bates et al. 2014). Habitat is available at Site B.

Table 6-2: Species of Conservation Concern likely to occur on site

Common name	Scientific name	Status	Endemic
Karoo Dwarf Tortoise	*Homopus boulengeri*	Near Threatened	
Little Karoo Dwarf Chameleon	*Bradypodion gutturale*	Least Concern	Endemic
Dwarf Girdled Lizard	*Cordylus minor*	Least Concern	Endemic
Graceful Crag Lizard	*Hemicordylus capensis*	Least Concern	Endemic
Red Adder	*Bitis rubida*	Least Concern	Endemic

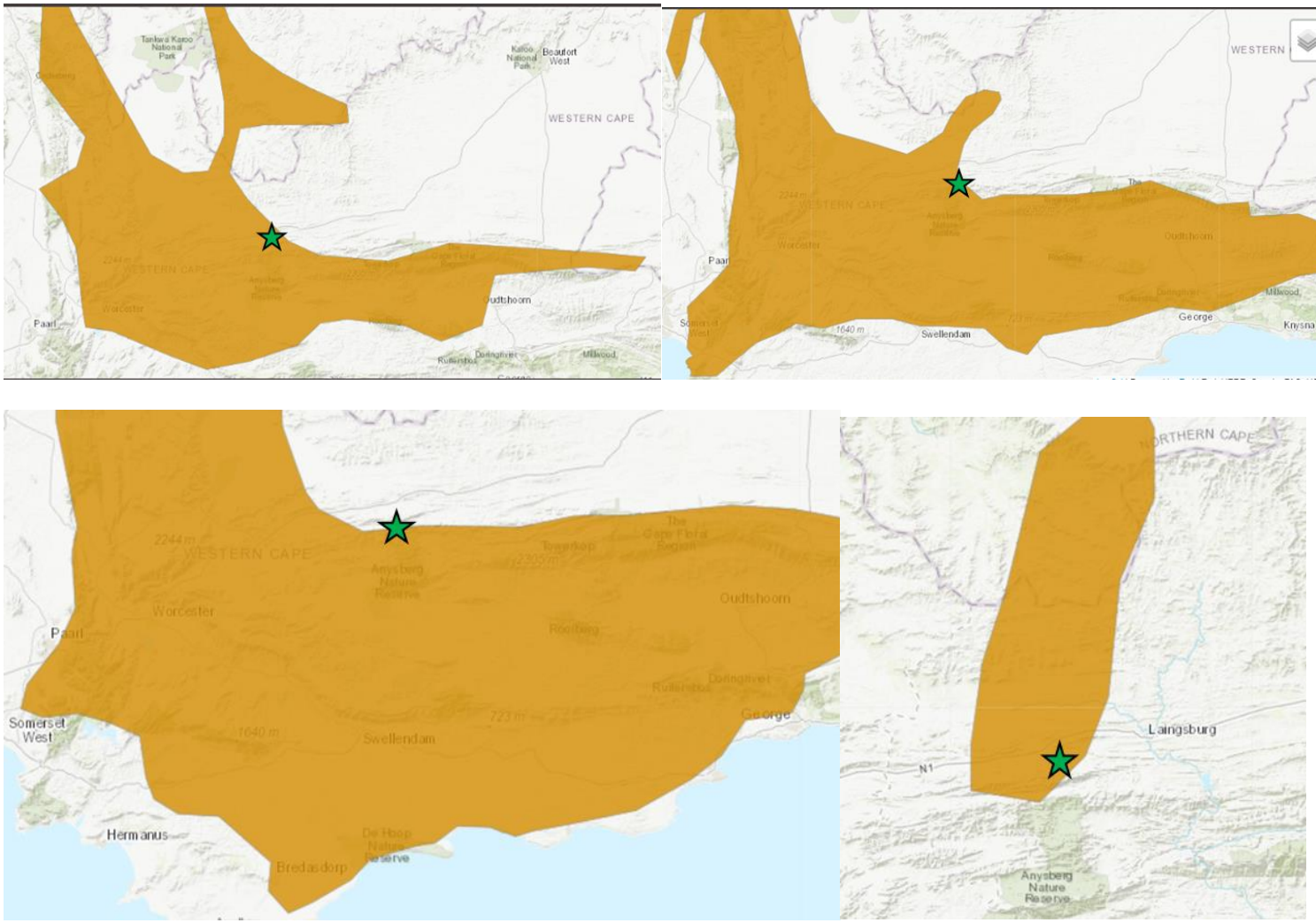


Figure 6-9: Little Karoo Dwarf Chameleon (Tolley, 2018), Graceful Crag Lizard (Bates, 2018), Red Adder (Maritz, & Turner, 2018) and Dwarf Girdled Lizard (Bates *et al*. 2018).

6.4.3 Amphibians

Of the 60 species of amphibians known to occur in the Western Cape 10 of these species have a distribution which coincides with the project area (Appendix 1C of the ecological report) (Turner & de Villiers, 2017; Du Preez & Carruthers, 2017). Approximately six of these 10 species have been recorded within a 30km^2 area (QDS 3320BA and/or 3320BC) within which the project area is located, namely the Cape River Frog (*Amietia fuscigula*), Sand Rain Frog (*Breviceps rosei*), Clicking Stream Frog (*Strongylopus grayii*), Common Caco (*Cacosternum boettgeri*), Cape Sand Frog (*Tomopterna delalandii*), Cape Sand Toad (*Vandijkophrynus angusticeps*) and Common Platanna (*Xenopus laevis*) (FitzPatrick, 2019).

The WC supports 15 known threatened and near-threatened species, none of which have a distribution which includes the project area (Minter *et al*., 2004). In total, 36 amphibian species are endemic to the Western Cape Province (Turner & de Villiers, 2017), and two (2) of these have a distribution which includes the project area, namely the Karoo Dainty Frog (*Cacosternum karooicum*) and Cape Sand Toad *(Vandijkophrynus angusticeps)* (Figure 4.3*).*

The Cape Sand Toad and Karoo Dainty Frog are likely to be found on site. Cape Sand Toad is recorded as inhabiting fynbos heathland and agricultural areas and breeds in temporary depressions in sandy/clay areas/soils (IUCN SSC ASG, 2013). Although the site is outside of its distribution range the FitzPatrick Institute of African Ornithology (2019) have confirmed the occurrence of nine individual Sand Rain Frog species within within a 30 square km area around the site (QDS 3320BA and/or 3320BC). Karoo Dainty Frog *lives in dry shrubland, semi-deserts, and rocky areas and is probably associated with stony substrates, aestivating in rock cracks and crevices during harsher conditions* (IUCN SSC ASG, 2013) and is considered likely to be found on site.

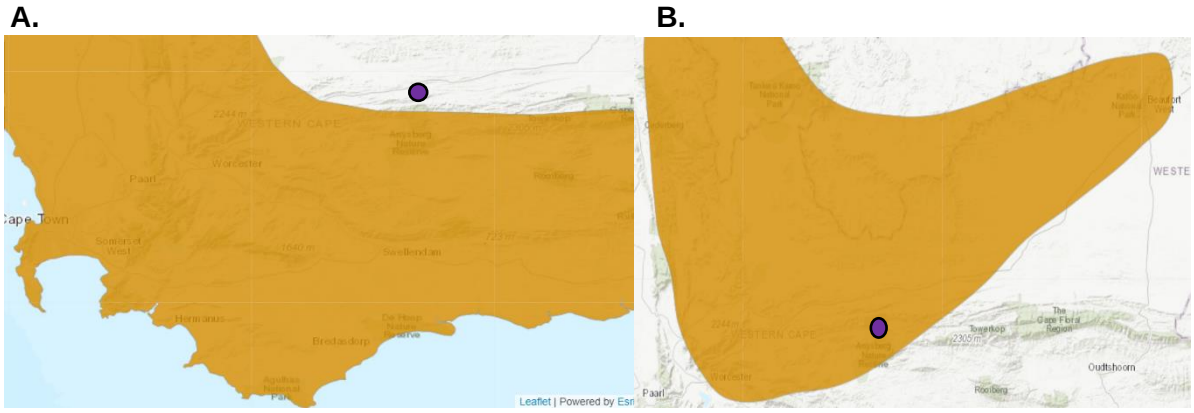


Figure 3-8: Amphibians Endemic to the Western Cape Province in relation to the project area (purple circle) A - Cape Sand Toad and B - Karoo Dainty Frog (IUCN SSC ASG, 2013).

6.4.4 Mammals

The WC is home to 172 mammal species, 90 of which have a distribution which includes the Project Area (Appendix 1E) (Birss, 2017). Approximately 55 mammal species have been recorded in QDS 3320BA and/or 3320BC within which the project area is located (FitzPatrick, 2018). No mammal species were recorded during the site visit.

At a site 20-40km north of Matjiesfontein Williams (2016) reported sightings of Chacma Baboon (*Papio ursinus*), Black-backed Jackal (*Canis mesomelas*) and Cape Grey Mongoose

(*Herpestes pulverulenta*). Todd (2016) reported the presence of Klipspringer and Grey Rhebok along the ridges. Animalia (2016) identified the potential for the following bats to occur in the area: Geoffroy's horseshoe bat, Egyptian slit-faced bat, Egyptian free-tailed bat, Robert's flat-headed bat, Natal long-fingered bat (NT), Long-tailed serotine Temmink'smyotis and Cape serotine.

The Western Cape has 24 threatened mammal species and 13 near threatened species (Birss, 2017). One (1) critically endangered, one (1) vulnerable species and four (4) Near-Threatened species have a distribution which includes the project area (Table 4.1). Five (5) of these species have been recorded within a 30km radius of the project site, including 27 Leopard, 26 Grey Rhebok, three (3) Cape Clawless Otter, two (2) Brown Hyena and 21 Striped Weasel sightings (FitzPatrick, 2018). The Anysberg Nature Reserve is approximately 23 km south of the project site and supports support Aardwolf, Aardvark and Cape Clawless Otter (Birdlife, 2015). The site is within their natural range, and hence these species can be expected to occur. The reserve hosts a small subpopulation of Brown Hyena and vagrants have been recorded on neighbouring farmland (Yarnell *et al.,* 2016).

Although not recorded within a 30 square km area around the site on the Animal Demography Unit's data record, the Riverine Rabbit has a limited southern population (Figure 3.9.) The Riverine Rabbit is both a flagship species for the Karoo and its presence in the Succulent Karoo is associated with ecosystem integrity. There are two distinct populations, one to the north and one to the south. The southern population of the Riverine Rabbit are not restricted to the alluvial floodplains in the southern Cape (C. Bragg pers. obs. 2014) and can also occur in old lands not associated with riverine vegetation. This species is known to browse *Pteronia erythrochaetha, Kochia pubescens, Salsola glabrescens* and species of *Aizoacae*. This species may occur on site given that the Koedoesberge-Moordenaars Karoo encompasses *Pteronia* dwarf shrubs.

Table 6-3: Threatened Mammal Species with a distribution that includes the site

Common name	Scientific name	Red list category	QDS # Recordings (ADU, 2019)
			3320BA, 3320BC
Riverine Rabbit	*Bunolagus monticularis*	Critically Endangered	
Leopard	*Panthera pardus*	Vulnerable	27
Grey Rhebok	*Pelea capreolus*	Near Threatened	26
Cape Clawless Otter	*Aonyx capensis*	Near Threatened	3
Brown Hyena	*Hyaena brunnea*	Near Threatened	2
African Striped Weasel	*Poecilogale albinucha*	Near Threatened	21
Fynbos Golden Mole (west)	*Amblysomus corriae devilliersi*	Near Threatened	

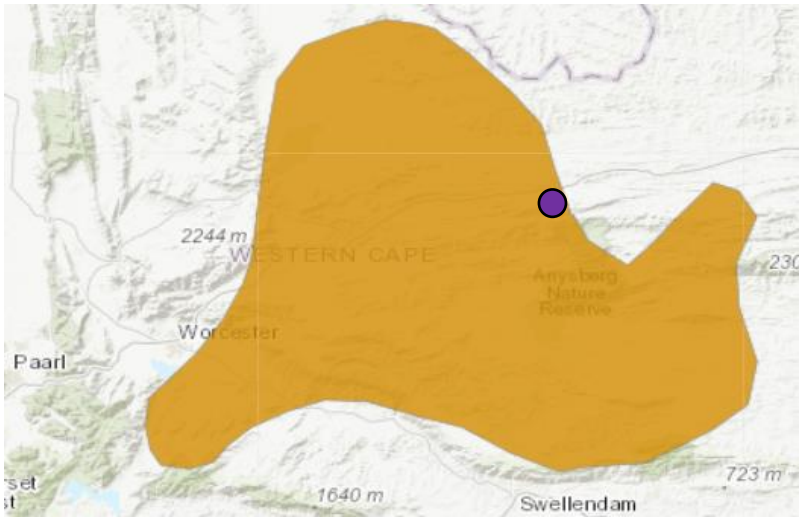


Figure 6-10: Project site (purple dot) in relation to Riverine Rabbit southern distribution range

Eight (8) mammal species are endemic to the Western Cape and ten (10) are near endemic. Three (3) endemic and three (3) near endemic mammal species have distribution ranges that extend through the project site (Table 6-4).

The Cape Spiny Mouse and Cape Molerat have been recorded within a 30 square km area around the site (Table 6-4) which is surprising given that the Cape Spiny Mouse inhabits rocky areas and is highly dependent on fynbos (Palmer, *et al*., 2017) and although Matjies Shale Fynbos occurs in the area it does not occur on the site (Figure 6-9), only Matjiesfontein Shale Renosterveld and Koedoesberge-Moordenaars Karoo vegetation. Cape Molerat most commonly prefer soil types derived from sandstone, limestone, shale and quartzite which comprise the sandy loam, clay and alluvium soils that are inhabited (Bennett *et al*. 2016). The Fynbos Golden Mole, Cape Gerbil, Cape Grysbok and Riverine Rabbit may occur on site. Fynbos Golden Mole inhabits renosterveld habitats of the south-west Cape (Bronner & Mynhardt, 2015). The Cape Gerbil inhabits sandy soil on the fringes of shrubland (Palmer & Cassola, 2016). Cape Grysbok natural (historical) distribution is primarily associated with the Fynbos Biome and extends into the Succulent Karoo Biome and is locally common in thickets, shrublands and fynbos habitats provided there is dense cover (Palmer *et al*., 2017).

Table 6-4: Endemic and Near-endemics WC Mammals with a distribution that includes the site

Scientific name	Common name	Red list category	QDS # Recordings (ADU, 2019)
			3320BA, 3320BC
ENDEMIC TO WESTERN CAPE			
Amblysomus corriae devilliersi	Fynbos Golden Mole (west)	Near Threatened	
Acomys subspinosus	Cape Spiny Mouse	Least Concern	40
Gerbilliscus afra	Cape Gerbil	Least concern	
NEAR ENDEMIC TO WESTERN CAPE			
Bunolagus monticularis	Riverine Rabbit	Critically Endangered	
Raphicerus melanotis	Cape Grysbok	Least Concern	
Georychus capensis	Cape Molerat	Least Concern	9

6.4.5 Avifauna

According to Avibase (Lepage, 2019) approximately 258 bird species occur within the Laingsburg region (Appendix 1B), Western Cape Province (Lepage, 2019). The project area falls within the distribution ranges of 11 threatened and 11 near-threatened species. Of the threatened species 5 are considered endangered and 6 vulnerable (Table 6-5).

Birds identified at a site 20-40km north of Matjiesfontein by Williams (2016) include sightings of Ludwig's Bustard (EN), Namaqua Sandgrouse and 14 species of birds of prey including Verreaux's Eagle (VU), Rock Kestrel, Pale Chanting Goshawk, Jackal Buzzards, Martial Eagle (EN) Booted Eagle, Black Harrier (EN), Rock Kestrels and Pale Chanting Goshawk. Commonly recorded species include the Cape Bunting, Sickle-winged Chat, Grey-backed Cisticola, Mountain Wheatear, Rock Martin and, in summer, Common Swift. Occasional sightings included the Karoo Prinia, Southern Double-banded Sunbirds, Fiscal Flycatcher, Cape Penduline Tit and two pairs of Ground Woodpeckers (Williams, 2016)

Table 6-5: Bird SCC with a distribution range that includes the site

Common name	Scientific name	Status	Endemic
Black Harrier	*Circus maurus*	Endangered	
Cape Griffon	*Gyps coprotheres*	Endangered	
Egyptian Vulture	*Neophron percnopterus*	Endangered	
Ludwig's Bustard	*Neotis ludwigii*	Endangered	
Lappet-faced Vulture	*Torgos tracheliotos*	Endangered	
Blue Crane	*Anthropoides paradiseus*	Vulnerable	
Knysna Warbler	*Bradypterus sylvaticus*	Vulnerable	
Black Bustard	*Eupodotis afra*	Vulnerable	Endemic
Maccoa Duck	*Oxyura maccoa*	Vulnerable	
Martial Eagle	*Polemaetus bellicosus*	Vulnerable	
Secretarybird	*Sagittarius serpentarius*	Vulnerable	
Yellow-tufted Pipit	*Anthus crenatus*	Near-threatened	
Kori Bustard	*Ardeotis kori*	Near-threatened	
Forest Buzzard	*Buteo trizonatus*	Near-threatened	
Curlew Sandpiper	*Calidris ferruginea*	Near-threatened	
Cape Rockjumper	*Chaetops frenatus*	Near-threatened	Endemic
Chestnut-banded Plover	*Charadrius pallidus*	Near-threatened	
Protea Canary	*Crithagra leucoptera*	Near-threatened	Endemic
Ground Woodpecker	*Geocolaptes olivaceus*	Near-threatened	
Sentinel Rock-Thrush	*Monticola explorator*	Near-threatened	
Eurasian Curlew	*Numenius arquata*	Near-threatened	
Lesser Flamingo	*Phoeniconaias minor*	Near-threatened	
Orange-breasted Sunbird	*Anthobaphes violacea*		Endemic
Victorin's Warbler	*Cryptillas victorini*		Endemic
African Pied Starling	*Lamprotornis bicolor*		Endemic
Cape Rock-Thrush	*Monticola rupestris*		Endemic
Cape Francolin	*Pternistis capensis*		Endemic
Gray-winged Francolin	*Scleroptila afra*		Endemic

Important Bird Area (IBA) are sites critical for the long-term survival of bird species that are globally threatened, have a restricted range, are restricted to specific biomes/vegetation types and/or have significant populations (BirdLife SA, 2019). South Africa has 101 Global IBAs and an additional 21 Regional IBAs. The nearest IBA's is the Anysberg Nature Reserve approximately 20 km south of the project area.

A total of 212 bird species have been recorded in Anysberg (BirdLife SA, 2019). The IBA was designated as such due to the presence of both globally and regionally threatened species, range-restricted and biome-restricted species including:

- *Globally threatened species are Blue Crane, Ludwig's Bustard, Southern Black Korhaan , Martial Eagle and Black Harrier.*
- *Regionally threatened species are Karoo Korhaan, Verreauxs' Eagle, Black Stork, Lanner Falcon and Cape Rockjumper.*
- *Range-restricted and biome-restricted species that are common in the IBA are Cape Spurfowl, Cape Bulbul and Karoo Chat."*

Please refer to the appended Ecological Assessment Report for detailed descriptions of the vegetation, faunal habitats and species of conservation concern which were identified within the proposed site and surrounding areas, the potential impacts and the recommended mitigation measures.

6.5 SOCIO-ECONOMIC PROFILE

The sites are located south of Matjiesfontein, in the Laingsburg Local Municipality within the Central Karoo District Municipality in the Western Cape Province. The nearest towns from the site include Laingsburg to the east (30km) and Touwsrivier to the west (55km).

The village of Matjiesfontein is located approximately 240 km from Cape Town, in the Klein Karoo and covers an area of only 1.22km². The main economic sectors in Matjiesfontein include agriculture and tourism/retail, however the town has been described as economically static, whilst in Laingsburg the three largest sectors are agriculture, retail and general government.

Population Distribution

According to the census data (2011) the total population of Matjiesfontein is approximately 422 people who live in informal and formal settlement areas in 95 households.

Of the 422 people in Matjiesfontein, 199 are under poverty, meaning that their annual income is less than R38 200. This equates to 55 of the 95 households and is 57,90% of the population (RDP, 2015)

Within the area of the Laingsburg local municipality within which Matiesfontein falls, there is a contrast in population with 8 430 people in 2 862 households that are under poverty. The expected growth rate for Laingsburg Local Municipality is 0.03%. No data for Matjiesfontein was available.

Age and Gender Structure

The Gender profile of Matjiesfonein shows an almost equal percentage of both genders with males being 46.45% and females being 53.55%.

There is insufficient census data regarding age structures in Matjiesfontein, however the majority of the population in the Laingsburg Municipality (64.8%) falls within the economically viable age group of 15-64 years with the dependency ration of 50.9%.

Level of Education

Learner enrolment in the Laingsburg Municipality increased slightly by 2.2 per cent between 2014 and 2016, from 1 220 to 1 247 learners. In 2016 the matric pass rate increased significantly to 90.3 per cent in Laingsburg, though there was a Gr 12 Drop-out Rate of 72.3% (Laingsburg Sep, 2017).

Unfortunately, no baseline information has been published specifically for Matjiesfontein. There is only one school in the village and due to technological (access to internet) and financial constraints, the likelihood of enrolment in distance higher education is unlikely.

Level of Employment and poverty

According to the report the categories of people vulnerable to poverty are African females, children 17 years and younger, people from rural areas, and those with no education. Inflation-adjusted poverty lines show that food poverty increased from R219 in 2006 to R531 per person per month in 2017. The lower-bound poverty line has increased from R370 in 2006 to R758 per person per month in 2017 while the upper-bound poverty line has increased from R575 in 2006 to R1 138 per person per month in 2017. The Laingsburg municipal area recorded a net increase in employment (476 jobs) over the past five years – indicating that the economy managed to recover from the job losses that occurred during the recession. In 2015, employment increased by 248 jobs, the largest net change in employment since 2010, mainly as a result of significant job increases in the agriculture, forestry and fishing sector during that year.

Household Incomes

There has been an increase of up to 1.1% in the number of households in extreme poverty, earning less than R2400 per annum, between 2001 and 2009 in the Laingsburg Local Municipality and more than 83.7% of the individuals earn less than R3 200 per month. The 2007 survey noted that about 1563 persons had no source of income, equating to some 30% of the Municipality's population with 46.47% of those relying on grants, being those who collect for child support, second by disability grants at 19.76%, followed by pensions.

This reflects a generally poor population in the Municipality The percentage of households earning between R18,000 and R42,000 annually declined by almost 20% during this period and those in the income bracket of between R42,000 to R54,000 per annum declined from by 0.4%. The number of households earning between R54,000 and R72,000 per annum increased from 6.5% to 9.6% in the period 2001 and 2009

As of the 2011 census, the majority of households earned between R9601 and R153800 Those earning more than R42 000 annually had increased and households earning less than R42 000 had decreased This trend reflects an upward mobility of the people within the area except for the very low R0 – R2 400 per annum and the R6 000 - R12 000pa household categories. (Laingsburg SDF, 2012).

6.6 CULTURAL HERITAGE

In order to mitigate the impacts to the heritage resource which is the PHS of Matjiesfontein, an alternative for Site A was identified and located between 3km and 5km away from the historic core of Matjiesfontein Provincial Heritage Site and is placed sensitively behind topographical buffers such as koppies to limit negative impact to the scenic qualities of the Matjiesfontein Valley. Site A, Alternative 2, is further west on the same farm as the Alternative 1 (site previously assessed) which, according to the cultural landscape assessment conducted for this project, the proposed development was anticipated to have a high impact on the landscape causing noticeable change to the visual environment. The development had high visual exposure; low visual absorption capacity and low compatibility For these reasons, Site A, Alternative 2 was chosen as the preferred alternative with regards to heritage resources as its proposed location was chosen taking local landform into consideration, is less visible from the N1 and other significant cultural sites and is screened from these by local landforms. Site B has marginal visibility and is almost entirely screened by the natural enclosed valley which is the site. Although the Zone of Visual Influence has not been determined for Site A, Alternative 2,. As such, this alternative complies with the recommendations of the Visual and Cultural Landscape Assessment (Eitzen, 2020). And the overall visual impact of the proposed development at Site A, Alternative 2 is therefore considered to be moderate.

Please refer to the appended Heritage Impact Assessment Report for detailed descriptions of the heritage and cultural landscape within the proposed site and surrounding areas, the potential impacts and the recommended mitigation measures.

6.6.1 Archaeological

The foot survey conducted provided a good description of the heritage resources located within the proposed development area.

Site A is located approximately 2.5km southwest of Matjiesfontein, in an area that shields much of the visual impact of the proposed communications station when viewed from Matjiesfontein. Besides some disturbance that has occurred in the area in the past with jeep tracks, the site is fairly undeveloped. The land has only been used for grazing of stock animals and 4x4 driving by guests from the Lord Milner Hotel.

In traversing the area that is proposed for a powerline associated with Site A, one hornfels flake (M1) was identified. There was a substantial amount of angular quartz vein, shale or quartzite fragments, that were smaller than 20cm in diameter, present within Site A, but no artefacts were observed in these localities. SANSA123 is located on a ridge of shale outcrops. A sparse amount of vegetation was present and the predominant rock types were shale and quartz. One silicified shale flake (M2) was identified. LGS18 is located on a slope with scattered shale and quartz vein fragments. One hornfels flake was identified (M3) near this site. The proposed development of an area for sewage and parking lay on a dwyka tillite ridge that was sparsely vegetated and covered in brown soil. No archaeological finds were observed in this area.

This site has very low archaeological sensitivity. Only one low density and diffuse Later Stone Age scatter was found around a low sandstone outcrop within the site and was graded as

having low, local significance (IIIC).Middle Stone Age stone tools were found across Area A in low numbers but across the area.

No archaeological finds were made in Site B.

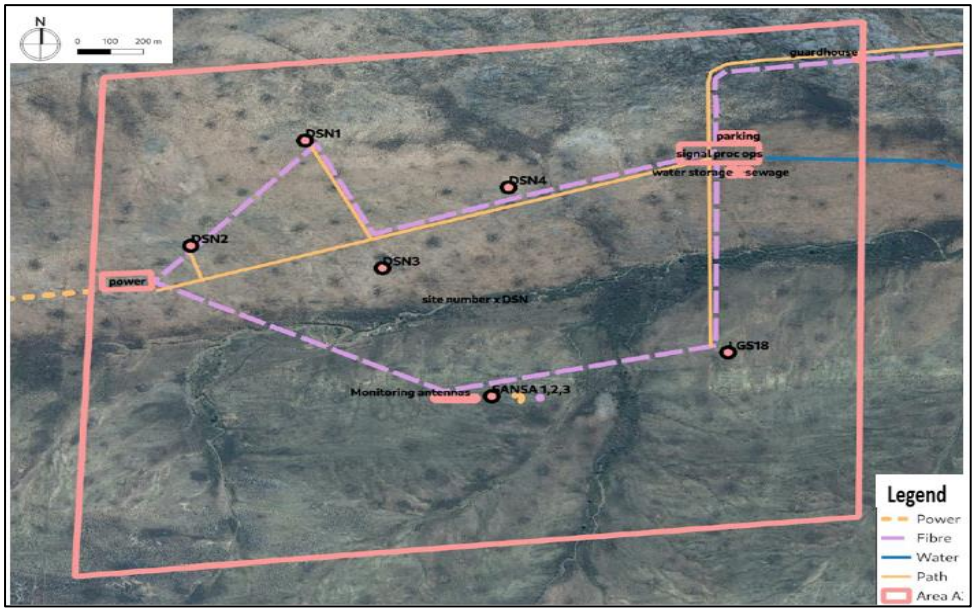


Figure 6-11: Site A infrastructure layout.

Please refer to the appended Archaeological Assessment Report for detailed descriptions of the archaeological findings within the proposed site and surrounding areas, the potential impacts and the recommended mitigation measures.

6.6.2 Palaeontological

Site A on the north is underlain by poorly-exposed Early Permian glacial bedrocks of the Elandsvlei Formation (Dwyka Group).These massive, dark grey, tombstone-weathered tillites as well as several irregular quartzite bodies enclosed within them – variously interpreted as esker or glacial outwash sandstones - are apparently unfossiliferous. Sparse vascular plant remains have been previously recorded from Dwyka Group sandstone bodies near Matjiesfontein by the famous South African geologist Du Toit in 1921. Stratified post-glacial mudrocks, diamictites and wackes exposed in stream beds and banks just south of Site A represent potentially fossiliferous Dwyka Group / Ecca Group contact beds but lie outside the development footprint. Most of the site is mantled with sandy to gravelly alluvial sediments as well as downwasted polymict surface gravels that are of low palaeontological sensitivity. No fossils were recorded at this site.

Site B to the south of Matjiesfontein Village lies within a tectonically-complex, intensely-folded and probably faulted zone embedded in the rugged foothills of the Witberg Range. Bedrocks of the Late Devonian to Early Carboniferous Witteberg Group (Cape Supergroup) represented here include highly-resistant, clean-washed quartzites of the Witpoort Formation, the recessive-weathering, mudrock-dominated Kweekvlei Formation and overlying prominent-

weathering, cross-bedded, pebbly sands of the Floriskraal Formation (The presence of younger Waaipoort Formation mudrocks and wackes here is equivocal).

The Witpoort and Floriskraal arenites are of low palaeosensitivity, having only yielded sparse reworked vascular plant debris, low-diversity trace fossil assemblages and rare fish remains in the Matjiesfontein region and elsewhere.

The Kweekvlei mudrocks in the study area are poorly-exposed, highly-weathered as well as fractured near-surface and show zones of intense soft-sediment and /or tectonicde formation. Good Witteberg Group bedding plane exposures are not seen and no fossils were recorded at this site. Most of Site B is covered by a thick (1m or more) blanket of coarse, rubbly and partially-ferruginised quartzitic gravels and sands of both colluvial and alluvial origin which are generally of low palaeontological sensitivity. It is noted, however, that well-preserved Holocene elephant remains are known from comparable deposits near Laingsburg.

Please refer to the appended Paleontological Assessment Report for detailed descriptions of the palaeontological findings within the proposed site and surrounding areas, the potential impacts and the recommended mitigation measures.

7 SENSITIVITY ANALYSIS

A site sensitivity analysis has been conducted based on specialist and general site information gathered. The site was classified into areas of low, Moderate and High Sensitivity and No-Go areas were identified.

- **NO-GO** includes areas where no construction should take place.
- **High Sensitivity** areas will require considerable effort to design out, mitigate or manage negative environmental impacts. In many cases this will not be possible and in general these areas should be avoided. Only facilities that are location dependent should be permitted in these areas.
- **Moderate Sensitivity** areas can accommodate development, but there are constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels, and appropriate technology and design will be required to reduce impacts and ensure sustainability.
- **Low Sensitivity** areas can be easily developed, as there are only minor constraints, and little mitigation and management is required (aside from normal building design and construction restrictions outlined in the EMP).
-

Figure 7-1 below indicates the environmental sensitivities which were identified by the DEFF screening report prior to the specialist ground truthing.

Table 7-1 and Figure 7-2 below indicates the sensitive environmental features identified by the specialists within the vicinity of the proposed development site and surrounding areas.

Areas of high sensitivity include all drainage lines and ecological support areas, both of which overlap with each other. As mentioned previously, other than fences and some road crossings, SANSA have purposefully located the infrastructure outside of these sensitive areas to minimise their impact.

The remaining areas are of moderate sensitivity from an ecological perspective as although they are intact and there are some SCC present, the vegetation types are listed as Least Threatened and are widespread.

In terms of the cultural landscape, the visual sensitivity of the preferred site (Site A/Alternative 2) is considered to be of moderate significance. This alternative is located between 3km and 5km away from the historic core of Matjiesfontein Provincial Heritage Site and is placed sensitively behind topographical buffers such as koppies to limit negative impact to the scenic qualities of the Matjiesfontein Valley. This site is further west on the same farm, and the proposed location was chosen taking local landform into consideration.
This site is less visible from the N1 than the original site (Site A/Alternative 1) and other significant cultural sites and is screened from these by local landforms. This site was chosen based on the recommendations received from the Heritage Impact Assessment which was to relocate the infrastructure further away from the town of Matjiesfontein in order to reduce the visual impact. SANSA have therefore found an alternative location to adhere to this recommendation.

From an archaeological and palaeontological perspective, though the region is known to be of both palaeontological and archaeological significance, no finds of significance were made during both site visits and the specialists consider the project area to be of low sensitivity

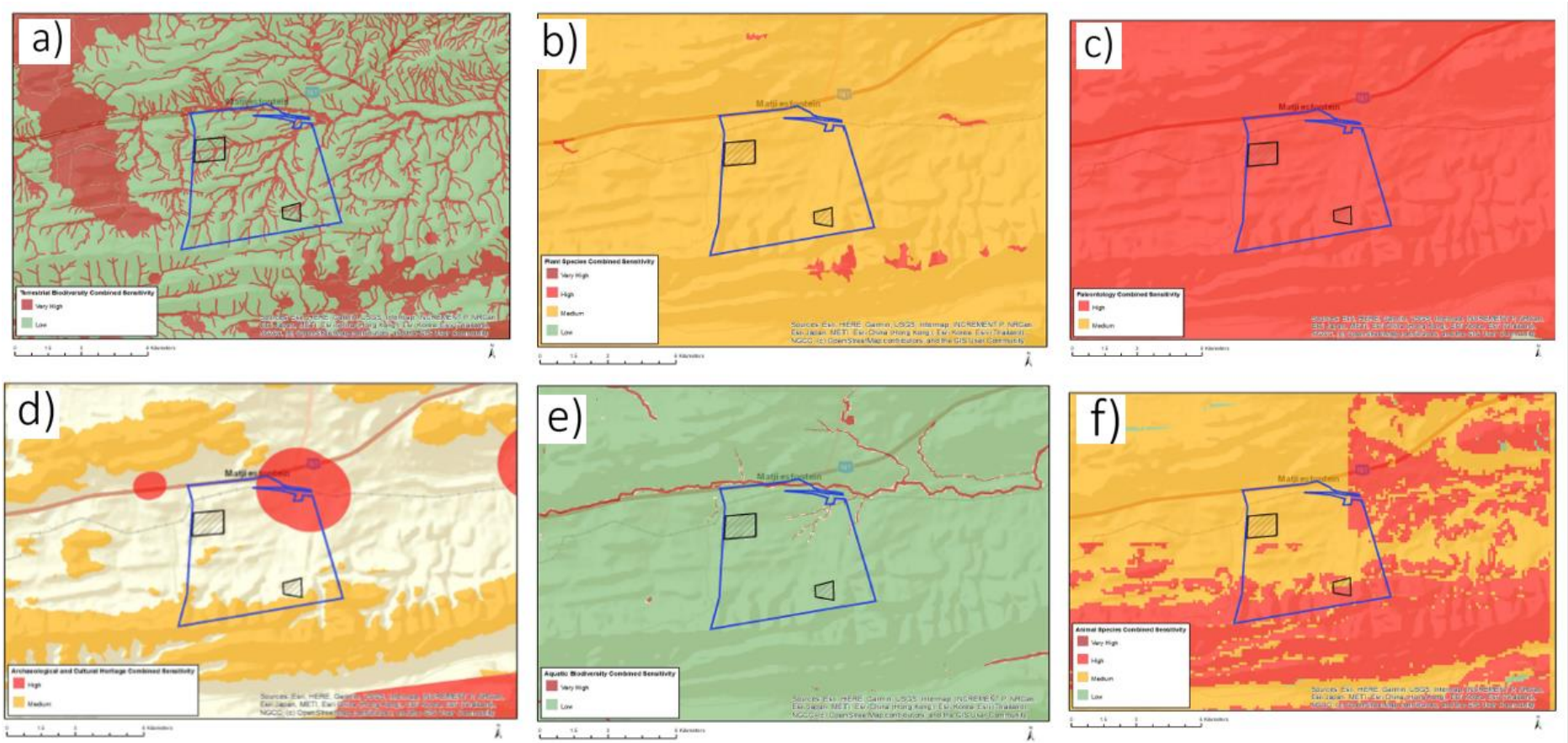


Figure 7-1: DEFF Screening Tool for (A) Terrestrial Biodiversity Combined Sensitivity (B) Flora (C) Palaeontological (D) Archaeology and Cultural Heritage (E) Aquatic Biodiversity (F) Fauna.

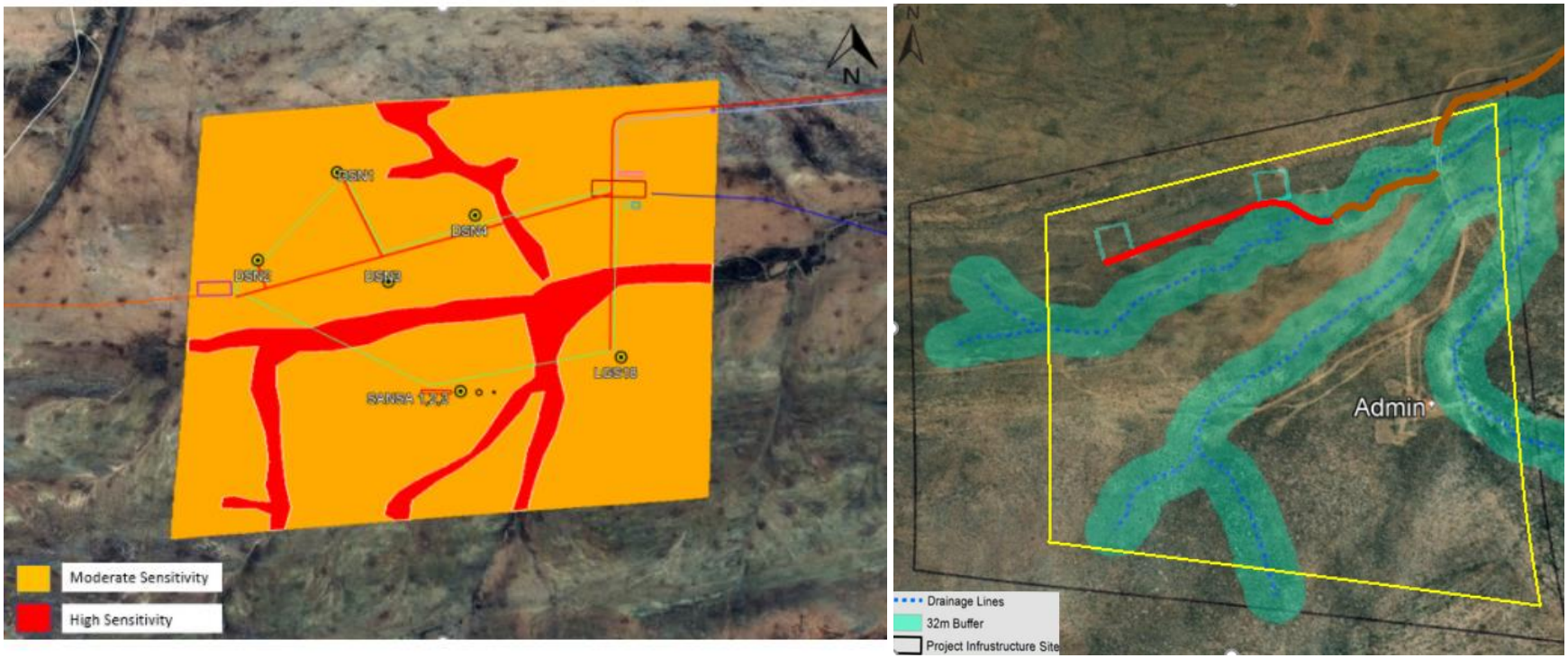


Figure 7-2: Infrastructure placed outside of sensitive areas of high sensitivity Site A (Left) and Site B, Right with 32m buffer

Table 7-1: Sensitive Features in the Study Area

SENSITIVE ENVIRONMENT	DESCRIPTION	RISK
Ecological Environment (Fauna)	• Drainage lines within the site act as corridors for smaller animals	**HIGH**
Ecological Environment (Fauna)	• Ecological Support Areas	**HIGH**
Ecological Environment (Flora)	• Overall moderate impact as the vegetation types listed on site are of Least Concern, though they are almost entirely intact, with no alien species recorded	**MODERATE**
Heritage and Archaeological Features – Heritage specialist findings	• No Artefacts found with archaeological or Palaeontological significance	**LOW**
Visual Impacts	• Visual Impacts at Alternative 2 (preferred alternative), Site A further from Matjiesfontein	**MODERATE**
	• The infrastructure at Site B will have marginal visibility	**LOW**

8 ALTERNATIVES

One of the requirements of a Basic Assessment is to investigate alternatives associated with a proposed activity. Alternatives are different ways of meeting the general purpose of the proposed activity, for example alternative sites for consideration, activity to be undertaken, technology to be used or temporal alternatives (phased approach, seasons) or the no-go alternative The identification, description, evaluation and comparison of the alternatives are important for ensuring the objectivity of the assessment process- without objective and thorough assessment of alternatives, the EIA process's decision-making may be compromised.

8.1 REASONABLE AND FEASIBLE ALTERNATIVES

Alternatives should include consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. In all cases, the no-go alternative must be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

"Alternatives", in relation to a proposed activity, means different ways of meeting the general purpose and requirements of the activity, which may include alternatives to—

- The property on which, or location where, it is proposed to undertake the activity;
- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity;
- The operational aspects of the activity; and/or
- The option of not implementing the activity.

8.2 FUNDAMENTAL INCREMENTAL & NO-GO ALTERNATIVES

8.2.1 Fundamental Alternatives

Fundamental alternatives are developments which are completely different from the proposed project description and usually include the following:

- Alternative property or location where it is proposed to undertake the activity;
- An alternative type of activity to be undertaken; and
- Alternative technology to be used in the activity

8.2.2 Incremental Alternatives

Incremental alternatives relate to modifications or variations to the design of a project that provide different options to reduce or minimise environmental impacts. Incremental alternatives which can be considered, include:

- Alternative design or layout of the activity; and
- Alternative operational aspects of the activity.

8.2.3 No-go Alternative

It is mandatory to consider the “no-go” option in the Basic Assessment Process. The “no-go” alternative refers to the current status quo and the risks and impacts associated with it. Some existing activities may carry risks and may be undesirable (e.g. an existing contaminated site earmarked for development). The no-go is the continuation of the existing land use, i.e. to maintain the status quo.

8.3 ANALYSIS OF ALTERNATIVES

Table 8.1 provides an analysis of the alternatives identified for the project. The table includes the assessment of the advantages and disadvantages of each alternative and provides further comments on the selected alternatives.

Table 8-1: Alternatives which were considered for the proposed project

Type of Alternative	Alternatives	Advantages	Disadvantages	Reasonable & Feasible	Comment
Location This refers to the fundamental location options and the environmental risks and impacts associated with such options.	Alternative 1, Site A	• 1km from Matjiesfontein and therefore easy access to infrastructure such as fibre, water and electricity and limited impact to the ecological environment as the trenching for powerlines and fibre cables is shorter. • No significant archaeological or palaeontological sites found within the site. • Site is of moderate ecological sensitivity and the vegetation types are widespread and Least Threatened. • Low population attributing to low radio interference • Low moisture and rainfall ideal for this type of development. • Suitable underlying geology offering the most stable ground • The landscape offers a clear horizon with a flat area offering limited interference to the radio antennae.	• High visual intrusion on the living heritage site of Matjiesfontein which is difficult to mitigate.	No	The visual intrusion on the town of Matjiesfontein is high and difficult to mitigate. The presence of the large antennae would change the cultural integrity of the Provincial Heritage site.

Type of Alternative	Alternatives	Advantages	Disadvantages	Reasonable & Feasible	Comment
	Alternative 2, Site A (Preferred Alternative)	• 3.3km from Matjiesfontein, closer to electrical infrastructure of Eskom • Reduced impacts on cultural landscape (Moderate) as visual intrusion is significantly reduced • No significant archaeological or palaeontological sites found within the site. • The majority of the site is of moderate ecological sensitivity and the vegetation types are widespread and Least Threatened. • low population attributing to low radio interference • Low moisture and rainfall ideal for this type of development.	• Some of the infrastructure such as fences and roads will be within 32m of water courses • The water pipeline and fibre line will need to be trenched over a greater distance than Alternative 1.	Yes	The visual intrusion on the town of Matjiesfontein is significantly reduced by placing the location of the antennae further away from the town of Matjiesfontein. The sensitivities related to impacts on the ecological, archaeological and palaeontological environment are similar to Alternative 2, Site A. A water use license application will be undertaken for each crossing and impacts can be mitigated through guidelines set out in the EMPr during the construction phase of the proposed project.
Activity					

Type of Alternative	Alternatives	Advantages	Disadvantages	Reasonable & Feasible	Comment
This refers to the type of activity to achieve the same goal. A simple example is the provision of public transport instead of increasing the capacity of the road.	Transmission and reception of communications with satellites in orbit can only be achieved by the proposed activity. This relies on powerful radio antenna which can receive electromagnetic waves from outer space and respond with laser waves. As such, alternative activities for the antennas themselves have not been assessed further.				
	Above Ground Powerline and fibre cable	• Easy to install • Lower impact on the ecological and palaeontological environment as less excavation is required. • Costs less to install	• Higher visual impact than underground cables. • Possible impact on birds. • Emits electric field/frequency which interferes with radio antenna signal	NO	Although aboveground powerlines can be easily and reasonably installed, the belowground option is preferable as the visual intrusion on the landscape will be less and the powerlines will not interfere with the radio signal and therefore data collection of the antennas.
	Below ground powerline and fibre cable	• No visual intrusion on the cultural landscape. • Lower maintenance cost/less likely to be damaged • Emits lower electric field and frequency	• Higher impact on the biodiversity as a trench will need to be dug and the cable laid. The footprint and therefore impact will be higher on biodiversity than	Yes	This is the preferred alternative as the visual intrusion will be lower and will not create an obstruction or interference to the antennae Even though there will be a slightly higher

Type of Alternative	Alternatives	Advantages	Disadvantages	Reasonable & Feasible	Comment
			the above ground option. • Initial cost of installation is higher than high tension, above ground powerlines		impact on the biodiversity due to the larger area that will need to be excavated, this impact will still be of low significance as the vegetation is widespread.
Design or Layout This relates mostly to alternative ways in which the proposed development or activity can be physically laid out on the ground to minimise or reduce environmental risks or impacts	Alternative 2, Site A (preferred alternative)	• The current layout has been situated outside of sensitive areas such as drainage lines and ESA's so as to minimise the impact on the biodiversity. • Current access roads will be used where feasible to minimise the impact of the project on the site.	• The location of the antennae away from the drainage features means that they are higher up and may be slightly more visible from the town of Matjiesfontein than they could have otherwise been.	Yes	Layout alternatives can be achieved through micro-siting of infrastructure to avoid sensitive areas.

Type of Alternative	Alternatives	Advantages	Disadvantages	Reasonable & Feasible	Comment
	• Site B	• The distance from Matjiesfontein means that the visual impact of development on the town of Matjiesfontein is significantly reduced	• Located 4km west of Matjiesfontein- further from electrical/water servitude	Yes	Although the site is further away from the available infrastructure, the project can still feasibly access this at the further site, though technological alternatives have been chosen (Solar power) at this site as well as a borehole which exists on site
Technological This refers to the type of technology, method or process used to achieve the same goal. For example, 1000 megawatt of energy could be generated using either a coal-fired power station or wind turbines	Each type of technology or antenna which is produced or manufactured for deep space communication and tracking is manufactured to serve a specific purpose or to achieve a specific goal. Therefore, the alternative in technology can only be measured against an alternative purpose. Advances in the use of laser communication is a faster method, however the receivers (antennas) are all of a standard construction as they work by reflecting the radio waves in the dish and concentrating them at the raised/suspended epicentre. Depending on the distance of communication required, this will affect the size chosen, in this case communications both with mars and the moon and orbiting satellites. The most efficient technology was chosen in terms of achieving the desired outcome of high quality space communications at the recommendation of NASA.				
Demand					

Type of Alternative	Alternatives	Advantages	Disadvantages	Reasonable & Feasible	Comment
This arises when a demand for a certain product or service can be met by some alternative means (e.g. the demand for electricity could be met by supplying more energy or using energy more efficiently by managing demand).	As it has been seen in recent years, there is an increase and spearheading of science and technology in the space observation area. The Klein Karoo and the surrounding area has increasingly become of interest as an area for space observations, with the SKA and the largest telescope in Africa both existing in the Northern Cape The demand is arising from the international scientific research field, as NASA proposes to team up with SANSA in a mission to send a man to the moon in 2024. As with the niche which is space exploration, earth observations, satellite imagery and so forth- there is no alternative means of meeting the specific demand supplied by these antennas and other launches and their corresponding ground stations which work together to meet this demand. Access to information, connectivity and research are integral to the collaborative ideals of sharing knowledge and breaking new ground.				
"No-Go" Option This refers to the current status quo and the risks and impacts associated with it.	The no-go option can have both negative and positive impacts.	If the project were not to go ahead, the biodiversity within the site will remain intact nor will there be an impact on the cultural landscape.	If the project does not proceed, this will have a major impact on the country's entry into the global market of space exploration, science and technology . The project has the potential to provide a platform for community engagement and education, as well as employment during the construction phase which will be otherwise lost.	Yes	If the project does not proceed, there will be a loss of foreign investment and advancement in the international space advancement for South Africa.

9 IMPACT METHODOLOGY

To ensure a balanced and objective approach to assessing the significance of potential impacts, a standardised rating scale was adopted which allows for the direct comparison of specialist studies. This rating scale has been developed in accordance with the requirements outlined in Appendix 1 of the EIA Regulations (2014 and subsequent 2017 amendments).

Impact significance pre-mitigation

This rating scale adopts four key factors to determine the overall significance of the impact prior to mitigation:

1. **Temporal Scale**: This scale defines the duration of any given impact over time. This may extend from the short-term (less than 5 years, equivalent to the construction phase) to permanent. Generally, the longer the impact occurs the more significance it is.
2. **Spatial Scale:** This scale defines the spatial extent of any given impact. This may extend from the local area to an impact that crosses international boundaries. The wider the impact extends the more significant it is considered to be.
3. **Severity/Benefits Scale:** This scale defines how severe negative impacts would be, or how beneficial positive impacts would be. This negative/positive scale is critical in determining the overall significance of any impacts.
4. **Likelihood Scale:** This scale defines the risk or chance of any given impact occurring. While many impacts generally do occur, there is considerable uncertainty in terms of others. The scale varies from unlikely to definite, with the overall impact significance increasing as the likelihood increases.

For each impact, these four scales are ranked and assigned a score. These scores are combined and used to determine the overall impact significance prior to mitigation.

Table 9-1: Pre-mitigation Evaluation Criteria

Temporal Scale		
Short term	*Less than 5 years*	
Medium term	*Between 5-20 years*	
Long term	*Between 20 and 40 years (a generation) and from a human perspective also permanent*	
Permanent	*Over 40 years and resulting in a permanent and lasting change that will always be there*	
Spatial Scale		
Localised	*At localised scale and a few hectares in extent*	
Study Area	*The proposed site and its immediate environs*	
Regional	*District and Provincial level*	
National	*Country*	
International	*Internationally*	
Severity Scale	*Severity*	*Benefit*
Slight	*Slight impacts on the affected system(s) or party(ies)*	*Slightly beneficial to the affected system(s) and party(ies)*
Moderate	*Moderate impacts on the affected system(s) or party(ies)*	*Moderately beneficial to the affected system(s) and party(ies)*
Severe/ Beneficial	*Severe impacts on the affected system(s) or party(ies)*	*A substantial benefit to the affected system(s) and party(ies)*
Very Severe/ Beneficial	*Very severe change to the affected system(s) or party(ies)*	*A very substantial benefit to the affected system(s) and party(ies)*
Likelihood Scale		
Unlikely	*The likelihood of these impacts occurring is slight*	
May Occur	*The likelihood of these impacts occurring is possible*	
Probable	*The likelihood of these impacts occurring is probable*	
Definite	*The likelihood is that this impact will definitely occur*	

** In certain cases, it may not be possible to determine the severity of an impact thus it may be determined: Don't know/Can't know.*

Table 9-2: Description of Environmental Significance Ratings and associated range of scores

OVERALL SIGNIFICANCE *(The combination of all the above criteria as an overall significance)*	
VERY HIGH NEGATIVE	**VERY BENEFICIAL**
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. *Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance.* *Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.*	
HIGH NEGATIVE	**BENEFICIAL**
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. *Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated.* *Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.*	
MODERATE NEGATIVE	**SOME BENEFITS**
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. *Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant*.	
LOW NEGATIVE	**FEW BENEFITS**
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. *Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels.* *Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.*	
NO SIGNIFICANCE	
There are no primary or secondary effects at all that are important to scientists or the public. *Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.*	
DON'T KNOW	
In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information. *Example: The effect of a particular development on people's psychological perspective of the environment.*	

Impact significance post-mitigation

Once mitigation measures are proposed, the following three factors are then considered to determine the overall significance of the impact after mitigation.

1. **Reversibility Scale**: This scale defines the degree to which an environment can be returned to its original/partially original state.
2. **Irreplaceable loss Scale:** This scale defines the degree of loss which an impact may cause.
3. **Mitigation potential Scale:** This scale defines the degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

Table 9-3: Post-mitigation Evaluation Criteria

Reversibility	
Reversible	*The activity will lead to an impact that can be reversed provided appropriate mitigation measures are implemented.*
Irreversible	*The activity will lead to an impact that is permanent regardless of the implementation of mitigation measures.*
Irreplaceable loss	
Resource will not be lost	*The resource will not be lost/destroyed provided mitigation measures are implemented.*
Resource will be partly lost	*The resource will be partially destroyed even though mitigation measures are implemented.*
Resource will be lost	*The resource will be lost despite the implementation of mitigation measures.*
Mitigation potential	
Easily achievable	*The impact can be easily, effectively and cost effectively mitigated/reversed.*
Achievable	*The impact can be effectively mitigated/reversed without much difficulty or cost.*
Difficult	*The impact could be mitigated/reversed but there will be some difficultly in ensuring effectiveness and/or implementation, and significant costs.*
Very Difficult	*The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly.*

The following assumptions and limitations are inherent in the rating methodology:

- Value Judgements: Although this scale attempts to provide a balance and rigor to assessing the significance of impacts, the evaluation relies heavily on the values of the person making the judgment. For this reason, impacts of especially a social nature need to reflect the values of the affected society.
- Cumulative Impacts: These affect the significance ranking of an impact because it considers the impact in terms of both on-site and off-site sources. This is particularly problematic in terms of impacts beyond the scope of the proposed development and the EIA. For this reason, it is important to consider impacts in terms of their cumulative nature.
- Seasonality: Certain impacts will vary in significance based on seasonal change. Thus, it is difficult to provide a static assessment. Seasonality will need to be implicit in the temporal scale and, with management measures being imposed accordingly (e.g. dust suppression measures being implemented during the dry season).

10 IMPACT ASSESSMENT

The impact assessment for the proposed project was conducted in two parts; a general impact assessment, and various specialist impact assessments. The impact assessment identified and assessed impacts across four phases of development:

- Planning & Design Phase
- Construction Phase
- Operational Phase
- Decommissioning Phase

10.1 POTENTIAL IMPACTS

Impacts and mitigation measures for each phase for all alternatives and the no-go alternative are presented in the table below.

The identified impacts, the proposed mitigation measures and the significance of the impacts (before and after mitigation measures are implemented) are provided below.

Planning and Design Phase

Activities associated with the design and pre-construction phase pertains mostly to planning and design around the proposed development and is done at a desktop level. In some cases, site visits need to take place but the impact of these visits is negligible, if any, e.g. photographs, GPS point's etc.

Table 10-1: Impacts associated with the Construction Phase

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
CONSTRUCTION PHASE					
LOSS OF NATURAL VEGETATION	Site A, Alternative 1	*The building of the Radio Antennae and associated infrastructure in the project area will result in the direct loss of approximately 2ha of Koedoesberge-Moordenaars Karoo*	***MODERATE-***	• *Clearing must be kept to a minimum and **must not** occur within the adjacent river or outside of the construction footprint.* • *Top soil (20 cm, where possible) must be collected and stored in an area of low sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).* • *Only indigenous species must be used for rehabilitation.* • *Lay down areas must not be located within any watercourses or drainage lines.* • *Employees must be prohibited from making open fires during the construction phase.* • *An alien invasive management plan for the site must be created.* • *An in situ search and rescue plan must be developed and implemented for the numerous succulents and geophytes that will be impacted by the construction of the project site.*	**MODERATE-**
	Site A, Alternative 2 (preferred)	*The building of the Radio Antennae and associated infrastructure in the project area will result in the direct loss of approximately 2ha of Koedoesberge-Moordenaars Karoo Vegetation*			
	Site B	*The building of the Radio Antennae and associated infrastructure in the project area will result in the direct loss of less than 2ha of Matjiesfontein Shale Renosterveld*			
	No-go Alternative	*Given that each vegetation type is near intact and that very little degradation is currently occurring on site, if the project were to not go ahead the two sites would probably remain functioning as they currently are. The overall significance for the no-go alternative would thus be negligible.*	**Negligible**	• *Not Applicable*	**N/A**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
LOSS OF SPECIES OF CONSERVATION CONCERN (FLORA)	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*The permanent loss of individuals of eight plant species of conservation concern listed as Least Concern but as a Schedule 4 protected species on the PNCO list will occur. The severity of the impact will be of slight significance given the wide distribution of the species and the fact that it has a stable population*	**LOW -**	• *Prohibit all employees and contractors from harvesting plants;* • *Prohibit open fires during the construction phase;* • *Demarcate areas for use during construction and ensure that the construction activities remain within the designated area;* • *Where possible, ensure demarcated area avoid populations of SCC.* • *Obtain plant permits for the removal and/or destruction of SCC listed on the PNCO list.* • *Ensure that no activities occur within areas designated as no-go areas, particularly within drainage lines and watercourses.*	**LOW-**
	No-go Alternative	*There will be no loss of SCC under the No-Go alternative*	**Negligible**	• *Not Applicable*	**N/A**
LOSS OF EXTENT OF FAUNAL HABITAT FOR SPECIES OF CONSERVATION CONCERN (FAUNA)	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*The project area intersects the distribution of five reptile SCC, two amphibian, seven mammal and 19 bird SCC.* *The majority SCC are endemic to the WC, however, all have a broader range than the project site and although they may occur on site they are not restricted to the site and unlikely to be compromised by the development. The development is small in extent and has a short construction period thus disruption is considered minimal. The majority of SCC will occur at Anysberg and will not be affected by the development. Only breeding bird SCC and unlikely Riverine Rabbit inhabitants are considered an issue*	**MODERATE-**	• *Caution should be taken during bird SCC breeding season, particularly Ludwig's Bustard (Neotis ludwigii) (EN) (primarily between August-December), Black Bustard (Eupodotis afra) (VU) and Secretary bird (Sagittarius serpentarius) (VU) to prevent disruption to mating and damage to nests and eggs. Should these species be identified immediately prior to construction avoid the area and commence activities following fledglings leaving the nest.* • *Contact the Endangered Wildlife Trust - Riverine Rabbit Programme and ensure no known populations occur in the area.* • *Prevent staff from persecuting any faunal species during the construction phase;* • *Relocate any Karoo Dwarf Tortoise (Homopus boulengeri) found during earth moving activities;* • *Demarcate areas for use during construction and ensure that the construction activities remain within the designated area;* • *Ensure that no activities occur within areas designated as no-go areas.*	**LOW-**
	No-go Alternative	*There will be natural loss of Species of Conservation concern under the No-Go Alternative.*	**Negligible**	• *Not Applicable*	**N/A**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS/HABITAT FRAGMENTATION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*Fragmentation is one of the most important impacts on vegetation as it creates breaks in previously continuous vegetation, causing a reduction in the gene pool and a decrease in species richness and diversity. This impact occurs when more and more areas are cleared for resulting in the isolation of functional ecosystems, which results in reduced biodiversity and reduced movement due to the absence of ecological corridors.* *There is currently little to no fragmentation within or around either of the sites. The break in habitat caused by the construction of the antennae and associated roads will therefore be of moderate significance.*	**MODERATE-**	• *Rehabilitate laydown areas.* • *Use existing access roads and upgrade these where necessary*	**MODERATE-**
	No-go Alternative	*Under the no-go alternative, there will be no fragmentation and the associated impacts will thus be negligible*	**Negligible**	• *Not Applicable*	**N/A**
EFFECTS ON DRAINAGE LINES AND RIPARIAN HABITAT DUE TO ROAD CROSSINGS	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	The upgrading of existing roads could have an impact on riparian areas, particularly those sections of road that are adjacent to river courses. Activities associated with upgrading existing roads may result in aggregate spilling over into the water courses and blocking these. The unmitigated impact would be of moderate significance however **this can be easily mitigated by identifying these areas as no-go areas**	**MODERATE-**	• *Rehabilitate laydown areas.* • *Use existing access roads.* • *Ensure all riparian areas and water courses are identified as no-go areas and that no substrate is placed in these areas during construction.*	**LOW-**
	No-go Alternative	*Under the no-go alternative, there will be no fragmentation and the associated impacts will thus be negligible.*	**N/A**	• *Not Applicable*	**N/A**
DISTURBANCE OF AQUATIC VEGETATION AND HABITAT	Site A, Alternative 1	*During the construction phase, indiscriminate removal of vegetation or unnecessary encroachment into riparian vegetation may lead to*	**MODERATE**	• No removal of vegetation is to take place within 50m of any river, artificial or natural wetland, except for the control of alien vegetation. • Construction vehicles and machinery must not encroach into identified ‘no-go’ areas or areas outside the project footprint.	**MODERATE** LOW-

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Site A, Alternative 2 (preferred) Site B	*disturbance of the aquatic ecosystem.*		• Activities within 32m of a watercourse must obtain the necessary Water Use License prior to the commencement of such activities. •	
	No-go Alternative	*Under the no-go alternative, there will be no disturbance to aquatic vegetation and the associated impacts will thus be negligible.*	**N/A**	• *Not Applicable*	**N/A**
CONTAMINATION OF WATER FROM CONSTRUCTION ACTIVITIES	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*During the construction phase, accidental spillages of chemical/hazardous substances in the vicinity of watercourse may result in water pollution, adversely affecting the aquatic ecosystem.*	**HIGH**	• No machinery must be parked overnight within 50 m of the rivers/wetlands. • All stationary machinery must be equipped with a drip tray to retain any oil leaks. • Chemicals used must be stored safely on bunded surfaces in the site camp. • Cement mixing must take place on a contained and impermeable surface, should it be undertaken on site. • Emergency plans, and spill kits, must be in place in case of accidental spillages on site. • No ablution facilities should be located within 50 m of any river or wetland system. • Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution. • Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it. • All general waste temporarily stored on site must be done so in windproof/sealable containers before being disposed of at a registered landfill site.	**LOW**
	No-go Alternative	*Under the no-go alternative, there will be no contamination of water and the associated impacts will thus be negligible.*	**N/A**	• *Not Applicable*	**N/A**
SOIL COMPACTION AND EROSION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*Soil may be compacted by the movement and parking of construction vehicles. Compacted soil results in the reduced ability for plant growth and water absorption. The clearing of vegetation will result in the exposure of soils making them easily susceptible to erosion by wind and water (i.e. run-off) during high wind or rainfall events.*	**MODERATE-**	• *Clearing must be kept to a minimum;* • *Newly cleared and exposed areas must be promptly rehabilitated to avoid soil erosion;* • *Where necessary, temporary stabilization measures must be used;* • *Plan for the worst case, that is, for heavy rainfall and runoff events, or high winds;* • *Appropriate erosion control measures must be implemented, and a monitoring programme established to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken;* • *Care must be taken to ensure that runoff is well dispersed so as to limit erosion; and* • *No-go areas (i.e. areas that are highly susceptible to erosion) must be demarcated by the ECO and construction vehicles prevented from entering these areas.*	**LOW-**
	No-go Alternative	*Due to the lack of activity on site, besides a Mountain bike and jeep track, the likelihood of soil compaction and erosion is low and will be isolated in these areas, however it will be a continued impact*	**LOW-**	• *The existing roads should be maintained so as to avoid runoff*	**LOW-**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
ON-SITE FIRE RISK	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*If flammable substances are not properly stored and handled, there is an increase in the risk associated with onsite fires*	**MODERATE-**	• *All flammable substances must be stored in dry areas which do not pose an ignition risk to the flammable substances.* • *Smoking must not be permitted near flammable substances.* • *All cooking must be done in demarcated areas with a low fire risk.* • *No open fires will be allowed on site, unless in a demarcated area.* • *The construction personnel must be educated regarding fires and fire management.* • *Fire extinguishers and other firefighting equipment deemed suitable must be available on site at all times.*	**LOW-**
	No-go Alternative	*There is no increase in on-site fire risk under the no-go alternative.*	**N/A**	• *Not Applicable*	**N/A**
SOLID WASTE GENERATION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*It is anticipated that the proposed development will produce solid waste in the form of cleared vegetation, building rubble, excavated soil, excess concrete and general waste, such as litter, during the construction phase.*	**MODERATE**	• *Rubble and other construction waste produced should be re-used if possible and, where it is not possible, must be disposed of at the nearest registered waste disposal facility;* • *Rubble, which will not be reused, must be removed from site on a regular basis;* • *If rubble is stored on site, it should be stored on designated portions of land away from any sensitive areas;* • *Litter must be controlled during construction – adequate bins must be made available on site at all times. These must be made scavenger and weatherproof and must be emptied on a regular basis;* • *Construction materials stored at the site camp must be secured – i.e. plastics must be covered to prevent being blown off site;* • *The construction area must remain litter free and regular inspections for litter must be conducted. The activity should not contribute to any surrounding windblown litter;* • *Waste skips must be covered and emptied regularly;* • *Waste manifests must be provided by the Contractor to prove legal disposal;* • *Empty cement bags must be kept in a sealed waste container;* • *Waste must not to be buried or burned.*	**LOW**
	No-go Alternative	*Very little waste pollution is observed on site however, due to the extent of the site, wind-blown litter can accumulate within the site.*	**LOW**	• *Not Applicable*	**LOW**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
SITE CONTAMINATION DUE TO HAZARDOUS SUBSTANCES	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	Onsite maintenance of construction vehicles/machinery and equipment could result in oil, diesel and other hazardous chemicals contaminating surface and groundwater. Surface and groundwater pollution could arise from the spillage or leaking of diesel, lubricants and cement during construction activities.	**MODERATE-**	• *The storage of fuels and hazardous materials must be located away from sensitive water resources.* • *All hazardous substances (e.g. diesel, oil drums, etc) must be stored in a bunded area.* • *The recommendations of the stormwater Management Plan must be implemented during construction.* • *If a spill occurs n a permeable surface (e.g soil), a spill kit must be used to reduce the potential spread of the spill immediately.* • *If a spill occurs on an impermeable surface esuch as cement or concrete, the surface spill must must be contained using oil absorbent materials.* • *Contaminated remediation materials must be carefully removed from the area of the spill, to prevent the further release of hazardous chemicals to the environment and stored in adequate containers until appropriate disposal in a licenced landfill site.*	**LOW-**
	No-go Alternative	*No hazardous substances are expected to occur on site under the No-go alternative*	**N/A**	• *Not Applicable, status quo remains*	**N/A**
AIR POLLUTION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*During construction, dust may be generated, especially where there is exposed ground. Specific activities that may contribute to the release of dust include offloading and stockpiling of building materials such as sand, storage of excavated materials and movement of heavy vehicles. The generation of dust may be exacerbated during windy, dry periods. In addition to dust, air pollution may result from the exhaust fumes emitted by construction vehicles, especially if the vehicles have not been serviced correctly.*	**MODERATE-**	• *Topsoil should be cleared in a phased manner to avoid large areas of bare ground;* • *Employ dust suppression measures such as wetting of the project area during dry, windy periods (Only water from a licensed source will be used);* • *Where practical, do not leave large cleared areas exposed for longer than necessary;* • *The area of disturbance must always be kept to a minimum;* • *Vehicle speed should be limited to the lowest possible and should not exceed 40km/h on the construction site, service road or gravel roads used to access the site camp.* • *Construction vehicles must be regularly maintained in order to ensure that no unnecessary exhaust fumes are being emitted.* •	**LOW-**
	No-go Alternative	*Due to the lack of activity on the site, under the No-Go Alternative there is currently little to no air pollution.*	**N/A**	• *Not Applicable*	**N/A**
INCREASE IN NOISE LEVELS	Site A, Alternative 1	*Construction activities are associated with an increase in noise levels as a result of construction vehicles, plant generators and various other equipment being used on site. Due to Alternative 1- Site A's close proximity to Matjiesfontein(1km) without any screening features to absorb the noise- the impact would be much more direct and the noise*	**HIGH-**	• *No construction activities may take place between sunset and sunrise;* • *Machinery that generates noise must be regularly maintained in order to ensure that no unnecessary additional noise is produced;* • *Equipment with lower sound levels should be selected where feasible.*	**MODERATE-**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
		experienced at a higher decibel frequency.			
	Site A, Alternative 2 (preferred alternative) Site B	*Site A, Alterntive 2 and Site B are located further away from the town of Matjiesfontein (approximately 3km). While construction activities will produce noise, the noise levels experienced by the residents and visitors to Matjiesfontein will be significantly lower than that of Alternative 1 at site A.*	**MODERATE-**	• *No construction activities may take place between sunset and sunrise;* • *Machinery that generates noise must be regularly maintained in order to ensure that no unnecessary additional noise is produced;* • *Equipment with lower sound levels should be selected where feasible.*	**LOW-**
	No-go Alternative	*The site currently experiences very low levels of activity, therefore under the No-Go alternative there will be no noise impacts.*	**N/A**	• *Not Applicable*	**N/A**
VISUAL IMPACTS	Site A, Alternative 1	*Construction vehicles and equipment will be evident in the existing landscape. Generation of dust will increase the visibility of the project and may become an eyesore if not managed correctly. Due to Alternative 1, Site A being approximately 1km from Matjiesfontein, it is calculated to have a High Visual*	**HIGH-**	• *Employ techniques to suppress dust and smoke generation during construction* • *The contractor should maintain good housekeeping on site to avoid litter and minimise waste;* • *Night lighting of the construction sites should be minimised within requirements of safety and efficiency of the Environmental Regulations for Workplaces in terms of the Occupational Health and Safety Act (Act No. 85 of 1993);* • *Fires and fire hazards need to be managed appropriately.*	**MODERATE-**
	Site A, Alternative 2 (preferred alternative)	*Construction vehicles and equipment will be evident in the existing landscape andthe generation of dust will increase the visibility of the project. However, due to Alternative 2, Site A being approximately 3.3km west of Matjiesfontein and surrounded by other infrastructure such as an Eskom sub-station, powerlines and railway it's impact is greatly diminished though would still be visible from the N1.*	**MODERATE-**	• *Employ techniques to suppress dust and smoke generation during construction* • *The contractor should maintain good housekeeping on site to avoid litter and minimise waste;* • *Night lighting of the construction sites should be minimised within requirements of safety and efficiency of the Environmental Regulations for Workplaces in terms of the Occupational Health and Safety Act (Act No. 85 of 1993);* • *Fires and fire hazards need to be managed appropriately.*	**LOW-**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	Site B	*•Located approximately 4km from Matjiesfontein, The construction activities at Site B will have marginal visibility as they will be screened from Matjiesfontein and the N1 by the ridgeline*	**LOW-**		**LOW-**
	No-go Alternative	*As the site is predominantly undisturbed, the No-Go alternative will result in no visual impacts*	**N/A**	• *Not Applicable, status quo remains*	**N/A**
TRAFFIC IMPACTS	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*During the construction phase of the proposed development, construction vehicles will utilise the existing road network. This may result in the impeding of traffic and damage to existing roads.* *Due to the size of the infrastructure which is made off site and trucked in and the proposed 2 year construction period, per antennae, it is likely that there will be a moderate increase in the volume of traffic and possible damages to the roads from construction vehicles and heavy trucks.The construction period could last up to 17 years* *For four months of each 2year cycle, up to 10 trucks will be accessing the site, for the remainder of the time there will be 1-3 trucks accessing the site per day.* *The N1 highway, which allows access to the R354 south to Matjiesfontein, experiences low to moderate traffic volumes on a daily basis.* *This intersection will be most affected by tail-gaiting trucks waiting to turn into Matjiesfontein and also poses a risk to increased road accidents.*	**HIGH-**	• *Large construction vehicles **must not** be permitted to utilize public roads during peak hours (AM: 06:30 – 08:30 and PM: 16:00 – 18:30);* • *Any damage to existing roads directly caused by large construction vehicles operating on this project must be repaired immediately* • *Placing additional signage may be necessary in order to forewarn road users of turning trucks and possible congestion and changes in speed on the roadway ahead.*	**MODERATE-**
	No-go Alternative	*Under the No-Go Alternative the impacts are negligible*	**N/A**	• *There will be no need for mitigation measures under the no-go alternative*	**N/A**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
PALAEONTOLOGICAL, ARCHAEOLOGICAL AND HERITAGE RESOURCES	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*There were no significant Palaeontological or Archaeological finds made by the heritage specialists who assessed the sites, however, there is a possibility that sub-surface fossil or other culturally significant finds may be unearthed during the excavation and construction stage due to the overall significance of the area.*	**LOW-**	• *The isolated artefacts were determined to have low heritage significance and as such, no further mitigation is recommended for these observations or the single site recorded (MATJIESFONTEIN002).* • *Should any archaeological, paleontological or cultural sites or objects be located during the construction of the proposed project, it must immediately be reported to the South African Heritage Resources Agency (SAHRA). Failure to report a site or object of archaeological and/or cultural significance is a contravention of the National Heritage Act (Act No. 25 of 1999).* • *Unless substantial new fossil finds are made before or during the construction phase, no specialist palaeontological mitigation is recommended for this development and there are no objections on palaeontological heritage grounds to its authorisation.*	**LOW-**
	No-go Alternative	*There will be no impact on Paleontological and Heritage Resources under the No-Go alternative*	**N/A**	• *Not Applicable*	**N/A**
HEALTH AND SAFETY RISKS	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*The use of construction machinery during the construction phase poses a potential risk to the health and safety of people working at the construction site as well as to commuters passing the site. The movement of construction vehicles also increases the risk of road accidents. The risk of accidents, fires and explosions must be mitigated effectively.*	**MODERATE-**	• *All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the Occupational Health and Safety Act, 1993 (No. 85 of 1993);* • *Smoking should be prohibited in the vicinity of flammable substances;* • *Any welding or other sources of heating of materials should be done in a controlled environment and under appropriate supervision;* • *Ensure availability of fire extinguishers;* • *All employees must be aware of emergency/ contingency plans to ensure an understanding of the hazards and procedures required during an emergency situation;* • *An emergency preparedness and response protocol must be development by the appointed contractor to be implemented for the duration of construction;* • *Records of environmental and/or health and safety related incidents should be maintained and communicated to the relevant persons;* • *The Contractor shall ensure that signage, which should be pictorial and in the vernacular, is erected to warn against entering the construction area;* • *Traffic calming and speed control measures for access to construction sites shall be instigated in consultation with the local authorities.*	**LOW-**
	No-go Alternative	*There will be no impact on Health and Safety under the No-Go alternative*	**N/A**	• *There will be no need for mitigation measures under the no-go alternative*	**N/A**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
EMPLOYMENT CREATION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*It is anticipated that the construction phase of the proposed development will create approximately 120 temporary jobs for local people living in the area, including the clearing of vegetation and site maintenance. Due to the somewhat on-going construction phase which could take up to 17 years to complete, construction phase employment could be viewed as Medium Term*	**LOW +**	▲ *Where feasible, priority for unskilled labour should be given to people from Matjiesfontein* ▲ *The construction of buildings, antennae and associated infrastructure will increase employment opportunities at the local level providing much needed income for families living in Matjiesfontein.* ▲ *However, due to the general lack of skills in the project area it is likely that positions requiring more than basic skills will be offered to more skilled "outsiders".*	**MODERATE +**
	No-go Alternative	*Under the no-go option a number of potential employment opportunities will be lost at a local and regional scale*	**MODERATE-**	▲ *There will be no need for mitigation measures under the no-go alternative*	**MODERATE +**
PURCHASING OF MATERIALS FROM LOCAL BUSINESSES	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*Where possible, materials will be sourced from local businesses and this will result in a boost of the local economy of the immediate vicinity and surrounding areas.*	**LOW +**	▲ *Building materials, hardware, sand, concrete and so forth should be sourced from the immediate community at Laingsburg.*	**MODERATE +**
	No-go Alternative	*Under the no-go option, opportunities for local businesses will be lost*	**N/A**	▲ *There will be no need for mitigation measures under the no-go alternative*	**N/A**
OPERATION PHASE					
VISUAL IMPACTS ON CULTURAL LANDSCAPE	*Site A, Alternative 1*	*Due to the size of the proposed antennae and the proposed location in close proximity to the PHS of Matjiesfontein (1km) the development at this site is anticipated to cause high visual intrusion on the cultural landscape which is difficult to mitigate.*	**HIGH-**	▲ *The perimeter treatment and fencing must be sensitive to the natural context and must be appropriately coloured to blend into the surrounding vegetation. Silver, black and bright green fencing should not be used.* ▲ *Where safety and technical standards permit, colours that blend into the natural environment and vegetation must be used for the antennae and associated infrastructure. These should be darker, duller colours that can disguise the infrastructure in the landscape. In the case of the reflective areas of the four large antennae, a naturally coloured tint should be considered for the working surface.* ▲ *Buildings must be made from local materials where possible and should draw from existing building traditions.* ▲ *A landscape plan is developed for avenue or block planting of gum trees or similar that fit into the cultural landscape to screen the proposed infrastructure from the PHS. This planting should be focussed on the south and eastern side of the railway line.* ▲ *Lighting must be minimised and carefully controlled, and must be developed with sensitivity to the rural landscape*	**HIGH--**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
				• *Wanton stripping of vegetation that causes scarring on the landscape must be avoided* • *The development should be moved to a site between **3km and 5km** from the PHS of Matjiesfontein*	
	Site A, Alternative 2 (preferred)	*Due to the size of the infrastructure and the nature of the landscape, it cannot be completely hidden from view from the N1 and Matjiesfontein, though at approximately 3,3 km from the PHS it has a significantly reduced zone of visual influence and is expected to have a moderate visual impact*	**MODERATE-**	• *The perimeter treatment and fencing must be sensitive to the natural context and must be appropriately coloured to blend into the surrounding vegetation. Silver, black and bright green fencing should not be used.* • *Where safety and technical standards permit, colours that blend into the natural environment and vegetation must be used for the antennae and associated infrastructure. These should be darker, duller colours that can disguise the infrastructure in the landscape. In the case of the reflective areas of the four large antennae, a naturally coloured tint should be considered for the working surface if feasible.* • *Buildings must be made from local materials where possible and should draw from existing building traditions.* • *A landscape plan is developed for avenue or block planting of gum trees or similar that fit into the cultural landscape to screen the proposed infrastructure from the PHS. This planting should be focussed on the south and eastern side of the railway line.* • *Lighting must be minimised and carefully controlled, and must be developed with sensitivity to the rural landscape* • *Stripping of vegetation that causes scarring on the landscape must be avoided*	**MODERATE-**
	Site B	•*Located approximately 4km from Matjiesfontein, The infrastructureat Site B will have marginal visibility as it will be screened from Matjiesfontein and the N1 by the ridgeline*	**LOW-**	• *Mitigation measures are not essential for this impact*	**LOW-**
	No-go Alternative	*Under the No-go alternative there will be no additional visual impacts*	**N/A**	• *There will be no need for mitigation measures under the no-go alternative*	**N/A**
INVASION OF ALIEN SPECIES	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*No alien species were recorded at any of the sites. However, disruption of habitats often results in the infestation of alien species unless these are controlled. Should this happen the impact will be of HIGH significance since the project will initiate the first colonization by alien species in the area.*	**HIGH-**	• *The site must be checked regularly for the presence of alien invasive species.* • *An alien invasive management plan must be incorporated into the EMPr.*	**LOW-**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
	No-go Alternative	*Under the no-go alternative, the infestation of alien species is unlikely to occur. The significance of this impact will be negligible.*	**N/A**	• *Under the no-go alternative, the infestation of alien species is unlikely to occur. The significance of this impact will be negligible.*	**N/A**
INCREASED STORMWATER RUNOFF AND EROSION POTENTIAL	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*The proposed development will result in more impermeable surfaces than what currently exists on site and this will result in increased runoff and potentially increased erosion.*	**MODERATE-**	• *Flood attenuation and storm water control measures must be implemented;* • *Storm-water structures need to be implemented as part of the development and must link up with the current storm-water infrastructure in order to navigate stormwater and minimise soil erosion;* • *At the first signs of erosion, the correct procedures must be undertaken to manage, resolve and prevent it from occurring.*	**LOW-**
	No-go Alternative	*Under the No-go alternative there will **not be an increase** in stormwater runoff and erosion.*	**N/A**	• *Not Applicable.*	**N/A**
CONTAMINATION OF WATER FROM OPERATION ACTIVITIES	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*During the operation phase, the inappropriate use, storage and handling of hazardous or chemical substances, as well as accidental hydrocarbon or chemical spillages on site could result in ground and surface water pollution.*	**HIGH-**	• No machinery must be parked overnight within 50 m of the rivers/wetlands. • All stationary machinery must be equipped with a drip tray to retain any oil leaks. • Chemicals used must be stored safely on bunded surfaces in the site camp. • Cement mixing must take place on a contained and impermeable surface, should it be undertaken on site. • Emergency plans, and spill kits, must be in place in case of accidental spillages on site. • No ablution facilities should be located within 50 m of any river or wetland system. • Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution. • Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it. • All general waste temporarily stored on site must be done so in windproof/sealable containers before being disposed of at a registered landfill site. •	**LOW-**
	No-go Alternative	*Under the No-go alternative there will be no risk of contamination*	**N/A**	• *Not Applicable.*	**N/A**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
SOLID WASTE GENERATION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*Solid waste during the operational phase will consist of the generation of litter from the employees who will work at the site, visitors or students conducting research and waste accumulated during maintenance of the facility and any equipment which breaks or has to be replaced. Solid waste has the potential to pollute the surrounding land if not managed correctly and could also pose a hazard to fauna. Due to the size of the project its potential impacts will not be far reaching.*	**LOW-**	• *Adequate waste disposal (litter) bins must be available on site. Bins located on the outside of the building must be properly secured and covered to prevent scavengers from tipping them;* • *A responsible person must be appointed to manage the solid waste generated at the proposed development in order to ensure that the waste is properly stored* • *Waste must regularly be disposed of at the municipal solid waste site.* • *Where possible, recycling should be instituted and different types of solid waste be kept in separate containers*	**LOW-**
	No-go Alternative	*It is likely that there will still be wind swept litter and possible illegal dumping on the site should the development not go head.*	**N/A**	• *Not applicable*	**N/A**
SEWERAGE AND WASTEWATER GENERATION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*The operation of the new development will contribute to additional effluent and wastewater being generated. This waste water will be temporarily stored in conservancy tanks which will be serviced regularly by a licensed waste hauling company and disposed of at the Matjiesfontein package plant. Sewage and wastewater has the potential to leak and contaminate the soils, stormwater and groundwater in the area.*	**MODERATE-**	• *Due to the proposed development requiring a conservancy tank for the temporary storage of waste water, the tank must be regularly emptied by a registered waste water carrier to ensure it does not overflow or leak;* • *Ablution facilities and associated piping must be adequately lined and checked for leaks on a regular basis.; and* • *Wastewater and effluent management must be implemented on site.*	**LOW-**
	No-go Alternative	*There is currently no sewerage or waste water generated on the site.*	**N/A**	• *Not applicable*	**N/A**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
NOISE	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*The proposed development may result in a slight noise increase due to a higher number of visitors passing through the area as well as additional administrative staff accessing the site. The overall noise level should not be any more than what is currently experienced on site.* *Increased noise may be experienced during periods of maintenance of the equipment.*	**LOW-**	• *Maintenance activities should be limited to hours between sunrise and sunset.*	**NEGLIGIBLE**
	No-go Alternative	*There is currently no unnatural noise experienced on the site as it is vacant, apart from the cyclists or maintenance checks by the farm owner.*	*N/A*	• *Not applicable*	**N/A**
EMPLOYMENT CREATION	Site A, Alternative 1 Site A, Alternative 2 (preferred) Site B	*The proposed development during the operational phase could potentially provide a variety of skilled positions and intern positions within the science, technology, research and development fields as well as provide for opportunities for South Africa to enter into the international Space Science sector and work on large projects.* • *Both indirect and direct economic opportunities will be created as a result of the project.* • *The presence of the Space Observation Station may directly serve it's intended purpose and employ scientific professionals and up and coming scholars as well as indirectly increasing economic opportunities as **SANSA will be the only** Space Station in the southern hemisphere which will document second stage launches of the Americas.* • *SANSA will hold exclusive selling power of imagery and other information and will be in high*	**LOW+**	• *Ensure that bursaries are offered to South African students to continue South African' exploration and involvement in international space projects;* • *Where feasible, upskill South African students and researchers interested in this field of science.*	**MODERATE +**

ISSUE	ALTERNATIVE	DESCRIPTION OF IMPACT	SIGNIFICANCE PRE-MITIGATION	MITIGATION MEASURES	SIGNIFICANCE POST-MITIGATION
		demand as a partner for international space operations as it already has caught the interest of NASA. • *The above translates to expected investments and funding from international partners which will be steered back into the economy, towards bursaries, research and contributions to safety and security through increasingly accurate weather and disaster predictions*			
	No-go Alternative	*Should the development not go ahead, there would be lost opportunity with far reaching consequences, not only for job creation in an integral sector of our economy and the space economy, but also to bridge new partnerships with international clients such as NASA and to gain vast recognition for South Africa's abilities in Research and Development*	**MODERATE-**	• *Not applicable*	**N/A**

Decommissioning Phase
It is unlikely that the proposed development will be decommissioned however, the impacts relevant to decommissioning would be similar to those listed for the construction phase above.

For a detailed breakdown of the cumulative impact calculation, please refer to Annexure 1 on page 94

11 RECOMMENDATIONS & CONCLUSION

11.1 SUMMARY OF IMPACTS

It is anticipated that there will be seven high, seventeen moderate and five low impacts associated with the construction and operation of satellite antennae at the two proposed sites (Site A, alternative 1 and Site B) (Table 11.1). However, with mitigation measures and if the preferred alternative is selected (Site A, alternative 2) these can be reduced to seven moderate and nineteen low impacts. Three of the high impacts seen in the table below relate to Site A, alternative 1 which is not the preferred alternative.

Table 11-1: Summary of Impacts pre and post mitigation

Impacts	Without mitigation	With mitigation	No-Go Alternative
CONSTRUCTION PHASE			
LOSS OF NATURAL VEGETATION	MODERATE-	MODERATE-	N/A
LOSS OF SPECIES OF CONSERVATION CONCERN (FLORA)	MODERATE-	LOW-	N/A
LOSS OF EXTENT OF FAUNAL HABITAT FOR SPECIES OF CONSERVATION CONCERN (FAUNA)	MODERATE-	LOW-	N/A
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS/HABITAT FRAGMENTATION	MODERATE-	MODERATE-	N/A
EFFECTS OF DRAINAGE LINES AND RIPARIAN HABITAT DUE TO ROAD CROSSINGS	MODERATE-	LOW-	N/A
DISTURBANCE OF AQUATIC VEGETATION AND HABITAT	MODERATE-	LOW-	N/A
SOIL COMPACTION AND EROSION	MODERATE-	LOW-	LOW-
SOLID WASTE GENERATION	MODERATE-	LOW-	LOW-
CONTAMINATION OF WATER FROM CONSTRUCTION ACTIVITIES	HIGH-	LOW-	N/A
SITE CONTAMINATION DUE TO HAZARDOUS SUBSTANCES	MODERATE-	LOW-	N/A
ON SITE FIRE RISKS	MODERATE-	MODERATE-	
AIR POLLUTION	MODERATE-	LOW-	N/A
INCREASE IN NOISE LEVELS			
Alternative 1	HIGH-	MODERATE-	N/A
Alternative 2 and Site B	MODERATE-	LOW-	N/A
VISUAL IMPACTS			
Alternative 1	HIGH-	HIGH-	N/A
Alternative 2	MODERATE-	MODERATE--	N/A
Site B	LOW-	LOW	

TRAFFIC IMPACTS	HIGH-	MODERATE-	N/A
PALAEONTOLOGICAL, ARCHAEOLOGICAL AND HERITAGE RESOURCES	LOW-	LOW-	N/A
HEALTH AND SAFETY RISKS	MODERATE	LOW-	N/A
EMPLOYMENT CREATION	LOW+	MODERATE+	MODERATE -
PURCHASING OF MATERIALS FROM LOCAL BUSINESSES	LOW+	MODERATE+	N/A
OPERATIONAL PHASE			
VISUAL IMPACTS			
Alternative 1	HIGH-	HIGH-	N/A
Alternative 2	MODERATE-	MODERATE-	N/A
Site B	LOW-	LOW-	N/A
INVASION OF ALIEN SPECIES	HIGH-	LOW-	N/A
INCREASED STORMWATER RUNOFF AND EROSION POTENTIAL	MODERATE-	LOW-	N/A
CONTAMINATION OF WATER FROM OPERATION ACTIVITIES	HIGH-	LOW-	N/A
SOLID WASTE GENERATION	LOW-	LOW-	N/A
SEWERAGE AND WASTEWATER GENERATION	MODERATE-	LOW-	N/A
NOISE	LOW-	NEGLIGIBLE	N/A
EMPLOYMENT CREATION	LOW+	MODERATE+	MODERATE-

11.2 RECOMMENDATIONS

It is recommended that the general and specialist mitigation measures under section 11.3 are included in the EMPr for each of the phases of the SANSA Infrastructure Development. In addition, the following is recommended:

➢ All necessary permitting and authorisations must be obtained before the commencement of any construction activities.

➢ A suitably qualified Environmental Control Officer (ECO) must be appointed before the commencement of the construction phase.

11.3 IMPACTS RESULTING FROM THE CONSTRUCTION PHASE

- *Caution should be taken during bird SCC breeding season, particularly Ludwig's Bustard (Neotis ludwigii) (EN) (primarily between August-December), Black Bustard (Eupodotis afra) (VU) and Secretary bird (Sagittarius serpentarius) (VU) to prevent disruption to mating and damage to nests and eggs. Should these species be identified immediately prior to construction avoid the area and commence activities following fledglings leaving the nest;*
- *Contact the Endangered Wildlife Trust - Riverine Rabbit Programme and ensure no known populations occur in the area;*

- *Prevent staff from persecuting any faunal species during the construction phase;*
- *Relocate any Karoo Dwarf Tortoise (Homopus boulengeri) found during earth moving activities;*
- *Demarcate areas for use during construction and ensure that the construction activities remain within the designated area;*
- *Ensure that no activities occur within areas designated as no-go areas;*
- *Rehabilitate laydown areas;*
- *Use existing access roads and upgrade these where necessary;*
- *Ensure all riparian areas and water courses are identified as no-go areas and that no substrate is placed in these areas during construction;*
- *No removal of vegetation is to take place within 50m of any river, artificial or natural wetland, except for the control of alien vegetation.*
- *Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.*
- *Activities within 32m of a watercourse must obtain the necessary Water Use License prior to the commencement of such activities.*
- *Clearing must be kept to a minimum;*
- *Newly cleared and exposed areas must be promptly rehabilitated to avoid soil erosion;*
- *Where necessary, temporary stabilization measures must be used;*
- *Plan for the worst case, that is, for heavy rainfall and runoff events, or high winds;*
- *Appropriate erosion control measures must be implemented, and a monitoring programme established to ensure that no erosion is taking place. At the first sign of erosion the necessary remedial action must be taken;*
- *Care must be taken to ensure that runoff is well dispersed so as to limit erosion;*
- *No-go areas (i.e. areas that are highly susceptible to erosion) must be demarcated by the ECO and construction vehicles prevented from entering these areas;*
- *Rubble and other construction waste produced should be re-used if possible and, where it is not possible, must be disposed of at the nearest registered waste disposal facility; Rubble, which will not be reused, must be removed from site on a regular basis;*
- *If rubble is stored on site, it should be stored on designated portions of land away from any sensitive areas;*
- *Litter must be controlled during construction – adequate bins must be made available on site at all times. These must be made scavenger and weatherproof and must be emptied on a regular basis;*
- *Construction materials stored at the site camp must be secured – i.e. plastics must be covered to prevent being blown off site;*

- *The construction area must remain litter free and regular inspections for litter must be conducted. The activity should not contribute to any surrounding windblown litter;*
- *Waste skips must be covered and emptied regularly;*
- *Waste manifests must be provided by the Contractor to prove legal disposal;*
- *Empty cement bags must be kept in a sealed waste container;*
- *Waste must not to be buried or burned;*
- *The storage of fuels and hazardous materials must be located away from sensitive water resources;*
- *All hazardous substances (e.g. diesel, oil drums, etc) must be stored in a bunded area;*
- *The recommendations of the stormwater Management Plan must be implemented during construction;*
- *If a spill occurs in a permeable surface (e.g soil), a spill kit must be used to reduce the potential spread of the spill immediately;*
- *If a spill occurs on an impermeable surface such as cement or concrete, the surface spill must be contained using oil absorbent materials;*
- *Contaminated remediation materials must be carefully removed from the area of the spill, to prevent the further release of hazardous chemicals to the environment and stored in adequate containers until appropriate disposal in a licenced landfill site;*
- *Topsoil should be cleared in a phased manner to avoid large areas of bare ground;*
- *Employ dust suppression measures such as wetting of the project area during dry, windy periods (Only water from a licensed source will be used);*
- *Where practical, do not leave large cleared areas exposed for longer than necessary;*
- *The area of disturbance must always be kept to a minimum;*
- *Vehicle speed should be limited to the lowest possible and should not exceed 40km/h on the construction site, service road or gravel roads used to access the site camp;*
- *Construction vehicles must be regularly maintained in order to ensure that no unnecessary exhaust fumes are being emitted;*
- *No construction activities may take place between sunset and sunrise;*
- *Machinery that generates noise must be regularly maintained in order to ensure that no unnecessary additional noise is produced;*
- *Equipment with lower sound levels should be selected where feasible;*
- *Employ techniques to suppress dust and smoke generation during construction;*
- *The contractor should maintain good housekeeping on site to avoid litter and minimise waste;*

- *Night lighting of the construction sites should be minimised within requirements of safety and efficiency of the Environmental Regulations for Workplaces in terms of the Occupational Health and Safety Act (Act No. 85 of 1993);*
- *Fires and fire hazards need to be managed appropriately;*
- *Large construction vehicles must not be permitted to utilize public roads during peak hours (AM: 06:30 – 08:30 and PM: 16:00 – 18:30);*
- *Any damage to existing roads directly caused by large construction vehicles operating on this project must be repaired immediately;*
- *Placing additional signage may be necessary in order to forewarn road users of turning trucks and possible congestion and changes in speed on the roadway ahead;*
- *Should any archaeological, paleontological or cultural sites or objects be located during the construction of the proposed project, it must immediately be reported to the South African Heritage Resources Agency (SAHRA). Failure to report a site or object of archaeological and/or cultural significance is a contravention of the National Heritage Act (Act No. 25 of 1999);*
- *All relevant Health and Safety legislation as required in South Africa should be strictly adhered to, including but not limited to the Occupational Health and Safety Act, 1993 (No. 85 of 1993);*
- *Smoking should be prohibited in the vicinity of flammable substances;*
- *Any welding or other sources of heating of materials should be done in a controlled environment and under appropriate supervision;*
- *All employees must be aware of emergency/ contingency plans to ensure an understanding of the hazards and procedures required during an emergency situation;*
- *An emergency preparedness and response protocol must be development by the appointed contractor to be implemented for the duration of construction;*
- *Records of environmental and/or health and safety related incidents should be maintained and communicated to the relevant persons;*
- *The Contractor shall ensure that signage, which should be pictorial and in the vernacular, is erected to warn against entering the construction area;*
- *Traffic calming and speed control measures for access to construction sites shall be instigated in consultation with the local authorities;*
- *Where feasible, priority for unskilled labour should be given to people from Matjiesfontein;*
- *Where feasible, building materials, hardware, sand, concrete and so forth should be sourced from the immediate community at Laingsburg;*
- *Vegetation clearance must be limited to approved and demarcated infrastructure development footprints;*
- *If fine building materials, such as sand, are to be transported on the back of trucks, they must be adequately covered;*

- *Excavations and other clearing activities must only be done during the agreed-upon working hours and days;*
- *All construction vehicles must be in sound working order and meet the necessary noise level requirements;*
- *All relevant municipal by-laws, with regards to noise control, must apply;*
- *Construction workers must not make use of portable radios, vehicle radios, whistles, etc., which generate excessive noise, while they are on the construction site;*
- *A Stormwater Management Plan must be compiled and implemented during the construction phase;*
- *Vegetation must be retained where possible to avoid soil erosion;*
- *If slopes are cleared during construction, they must be rehabilitated as soon as possible to minimise soil erosion losses;*
- *Construction activities must be demarcated and vegetation clearing and topsoil removal (if required) limited to these areas;*
- *Stockpiled materials must not be stored within 100 m of a watercourse;*
- *Stockpile areas must be suitably bunded to prevent waterborne erosion of exposed soils where there is a likelihood that the soils will be washed into nearby watercourses;*
- *The storage of fuels and hazardous materials must be located away from sensitive water resources;*
- *All hazardous substances (e.g. diesel, oil drums, etc.) must be stored in a bunded area.*
- *Contaminated remediation materials must be carefully removed from the area of the spill, to prevent the further release of hazardous chemicals to the environment, and stored in adequate containers until appropriate disposal in a licenced landfill site;*
- *All flammable substances must be stored in dry areas which do not pose an ignition risk to the flammable substances;*
- *Smoking must not be permitted near flammable substances;*
- *All cooking must be done in demarcated areas with a low fire risk;*
- *No open fires will be allowed on site, unless in a demarcated area;*
- *The construction personnel must be educated regarding fires and fire management; and*
- *Fire extinguishers and other firefighting equipment deemed suitable must be available on site at all times*
- *No machinery must be parked overnight within 50 m of the rivers/wetlands.*
- *All stationary machinery must be equipped with a drip tray to retain any oil leaks.*
- *Chemicals used must be stored safely on bunded surfaces in the site camp.*

- *Cement mixing must take place on a contained and impermeable surface, should it be undertaken on site.*
- *Emergency plans, and spill kits, must be in place in case of accidental spillages on site.*
- *No ablution facilities should be located within 50 m of any river or wetland system.*
- *Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.*
- *Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.*
- *All general waste temporarily stored on site must be done so in windproof/sealable containers before being disposed of at a registered landfill site.*
-

11.4 SANSA SATELLITE ANTENNAE AND INFRASTRUCTURE DEVELOPMENT IMPACTS RESULTING FROM THE OPERATIONAL PHASE

- *The site must be checked regularly for the presence of alien invasive species;*
- *An alien invasive management plan must be incorporated into the EMPr;*
- *Storm-water structures need to be implemented as part of the development and must link up with the current storm-water infrastructure in order to navigate stormwater and minimise soil erosion;*
- *At the first signs of erosion, the correct procedures must be undertaken to manage, resolve and prevent it from occurring;*
- *Adequate waste disposal (litter) bins must be available on site. Bins located on the outside of the building must be properly secured and covered to prevent scavengers from tipping them;*
- *A responsible person must be appointed to manage the solid waste generated at the proposed development in order to ensure that the waste is properly stored;*
- *Waste must regularly be disposed of at the municipal solid waste site.*
- *Where possible, recycling should be instituted and different types of solid waste be kept in separate containers;*
- *Due to the proposed development requiring a conservancy tank for the temporary storage of waste water, the tank must be regularly emptied by a registered waste water carrier to ensure it does not overflow or leak;*
- *Ablution facilities and associated piping must be adequately lined and checked for leaks on a regular basis.;*

- *No machinery must be parked overnight within 50 m of the rivers/wetlands.*
- *All stationary machinery must be equipped with a drip tray to retain any oil leaks.*
- *Chemicals used must be stored safely on bunded surfaces in the site camp.*
- *Cement mixing must take place on a contained and impermeable surface, should it be undertaken on site.*
- *Emergency plans, and spill kits, must be in place in case of accidental spillages on site.*
- *No ablution facilities should be located within 50 m of any river or wetland system.*
- *Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.*
- *Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.*
- *All general waste temporarily stored on site must be done so in windproof/sealable containers before being disposed of at a registered landfill site.*
- *Wastewater and effluent management must be implemented on site;*
- *Maintenance activities should be limited to hours between sunrise and sunset;*
- *Ensure that bursaries are offered to South African students to continue South African' exploration and involvement in international space projects; and*
- *Where feasible, upskill South African students and researchers interested in this field of science.*

11.5 CONCLUSION

The proposed project has the ability to increase the economic growth within South Africa through foreign investment and funding from international partners. The presence of the Space Observation Station will employ scientific professionals and up and coming scholars. It will also hold exclusive selling power of imagery and other information and will be in high demand as a partner for international space operations as it already has caught the interest of NASA.

Another expected outcome of the project is to provide educational opportunities for universities and their students, especially for those interested in space communications and navigation. Depending on the outcomes of the project, SANSA will be a key role player in long term projects implemented between SANSA and NASA, including assisting with and participating in developing the capabilities needed to send humans to an asteroid by 2025 and Mars in the 2030s.

The proposed project is therefore an important contributor to enhancing South Africa's presence in the growing global space economy and the emerging capabilities.

However, from a biophysical and heritage perspective, if not properly managed, the project could negatively impact the fauna and flora within the area as well as the cultural landscape of the area, particularly the Matjiesfontein PHS. However, with the implementation of the suggested mitigation measures and continued monitoring, these impacts can be reduced to acceptable levels.

ANNEXURE 1:CUMULATIVE PRE-MITIGATION IMPACT CALCULATION

ISSUE	AREA AFFECTED	TEMPORAL SCALE	SPATIAL SCALE	SERVERITY/BENEFICIAL SCALE	CERTAINTY SCALE	OVERALL SIGNIFICANCE WITHOUT MITIGATION
LOSS OF NATURAL VEGETATION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	PERMANENT	LOCAL	MODERATE	DEFINITE	MODERATE-
LOSS OF SPECIES OF CONSERVATION CONCERN (FLORA)	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	PERMANENT	LOCAL	SLIGHT	DEFINITE	MODERATE-
LOSS OF EXTENT OF FAUNAL HABITAT FOR SPECIES OF CONSERVATION CONCERN (FAUNA)	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	PERMANENT	LOCAL	MODERATE	DEFINITE	MODERATE-
DISRUPTION OF ECOSYSTEM FUNCTION AND PROCESS/HABITAT FRAGMENTATION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED)	PERMANENT	STUDY AREA	MODERATE	DEFINITE	MODERATE-

	SITE B					
EFFECTS OF DRAINAGE LINES AND RIPARIAN HABITAT DUE TO ROAD CROSSINGS	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	PERMANENT	STUDY AREA	MODERATE	DEFINITE	MODERATE-
DISTURBANCE OF AQUATIC VEGETATION AND HABITAT	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	PERMANENT	STUDY AREA	MODERATE	DEFINITE	MODERATE-
CONTAMINATION OF WATER FROM CONSTRUCTION ACTIVITIES	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	PERMANENT	STUDY AREA	HIGH	DEFINITE	HIGH-
SOIL COMPACTION AND EROSION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	LOCAL	MODERATE	DEFINITE	MODERATE-
SOLID WASTE GENERATION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	LOCAL	MODERATE	DEFINITE	MODERATE-

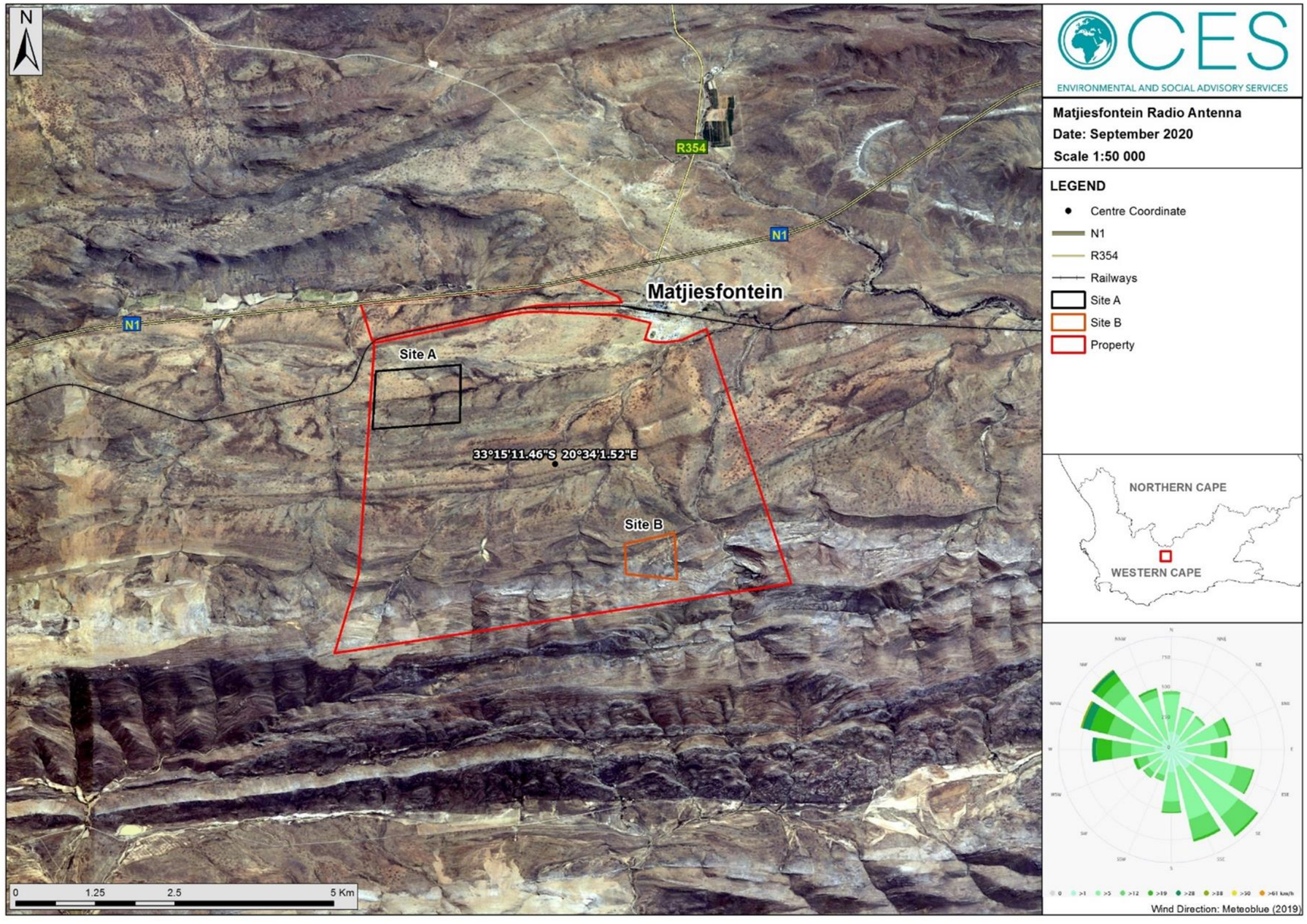
SITE CONTAMINATION DUE TO HAZARDOUS SUBSTANCES	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	LONG TERM	STUDY AREA	SEVERE	MAY OCCUR	MODERATE-
ON-SITE FIRE RISK	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM TERM	LOCAL	SEVERE	MAY OCCUR	MODERATE-
AIR POLLUTION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	STUDY AREA	MODERATE	DEFINITE	MODERATE-
INCREASE IN NOISE LEVELS	SITE A, ALTERNATIVE 1	MEDIUM	STUDY AREA	SEVERE	DEFINITE	HIGH-
	SITE A, ALTERNATIVE 2 (PREFERRED ALTERNATIVE) SITE B	MEDIUM	STUDY AREA	MODERATE	DEFINTE	MODERATE-
VISUAL IMPACTS	SITE A, ALTERNATIVE 1	MEDIUM	STUDY AREA	SEVERE	DEFINITE	HIGH-
	SITE A, ALTERNATIVE 2 (PREFERRED ALTERNATIVE) SITE B	MEDIUM	STUDY AREA	MODERATE	DEFINITE	MODERATE-

TRAFFIC IMPACTS	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	REGIONAL	SEVERE	DEFINITE	HIGH-
PALAEONTOLOGICAL, ARCHAEOLOGICAL AND HERITAGE RESOURCES	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	LOCALISED	SLIGHT	MAY OCCUR	LOW-
HEALTH AND SAFETY RISKS	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	REGIONAL	MODERATE	MAY OCCUR	MODERATE-
EMPLOYMENT CREATION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	LOCALISED	SLIGHT	MAY OCCUR	LOW +
PURCHASING OF MATERIALS FROM LOCAL BUSINESSES	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	REGIONAL	SLIGHT	MAY OCCUR	LOW+

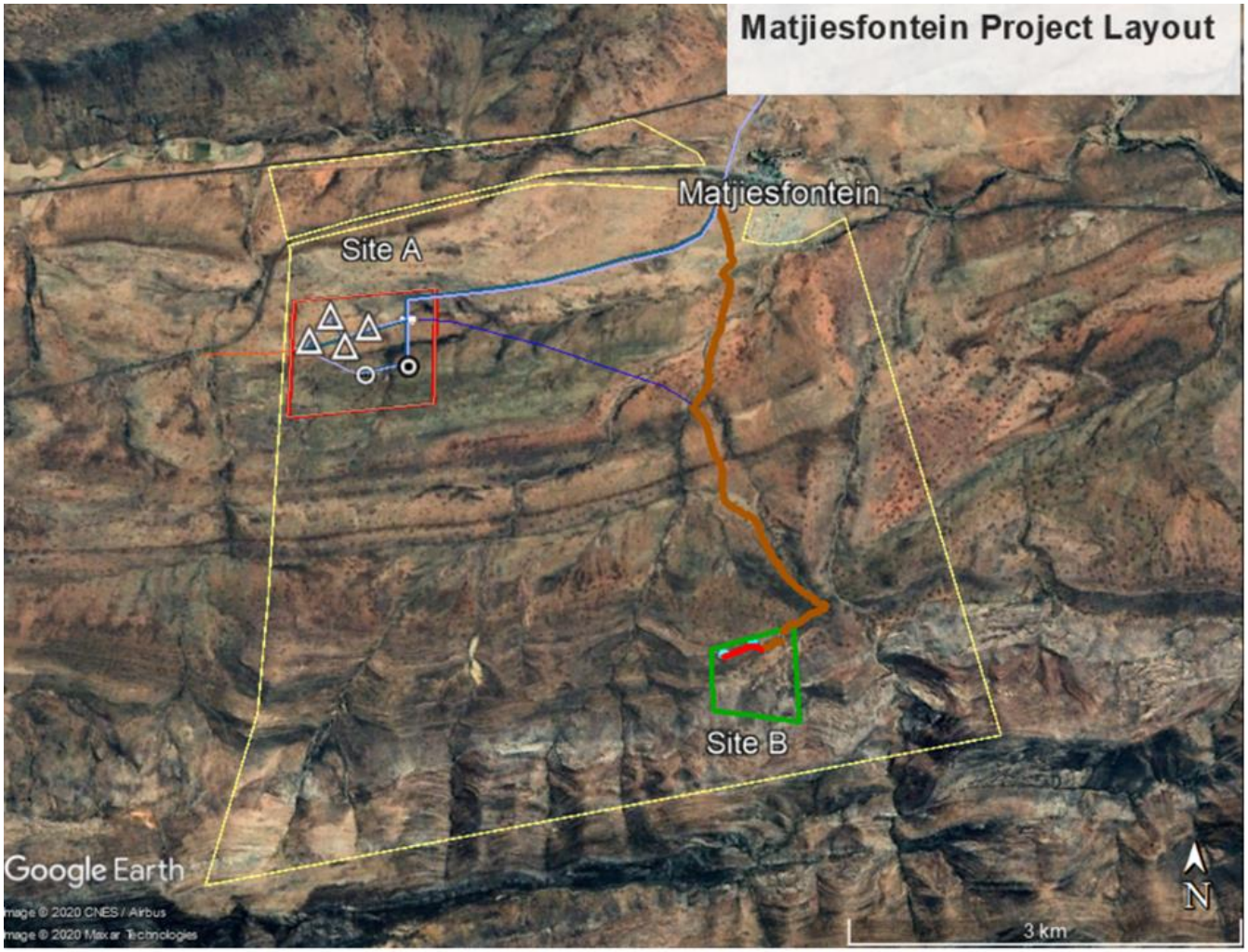
OPERATIONAL PHASE						
VISUAL IMPACTS ON CULTURAL LANDSCAPE	SITE A, ALTERNATIVE 1	LONG-TERM	STUDY AREA	SEVERE	DEFINITE	HIGH-
	SITE A, ALTERNATIVE 2 (PREFERRED)	LONG-TERM	STUDY AREA	MODERATE	DEFINITE	MODERATE-
	SITE B	LONG-TERM	LOCALISED	SLIGHT	UNLIKELY	LOW-
INVASION OF ALIEN PLANT SPECIES	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	LONG TERM	STUDY AREA	SEVERE	DEFINITE	HIGH
INCREASED STORMWATER RUNOFF AND EROSION POTENTIAL	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	LONG-TERM	STUDY AREA	MODERATE	DEFINITE	MODERATE -
CONTAMINATION OF WATER FROM OPERATION ACTIVITIES	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	PERMANENT	STUDY AREA	HIGH	DEFINITE	HIGH-
SOLID WASTE GENERATION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED)	MEDIUM	LOCALISED	SLIGHT	PROBABLE	MODERATE

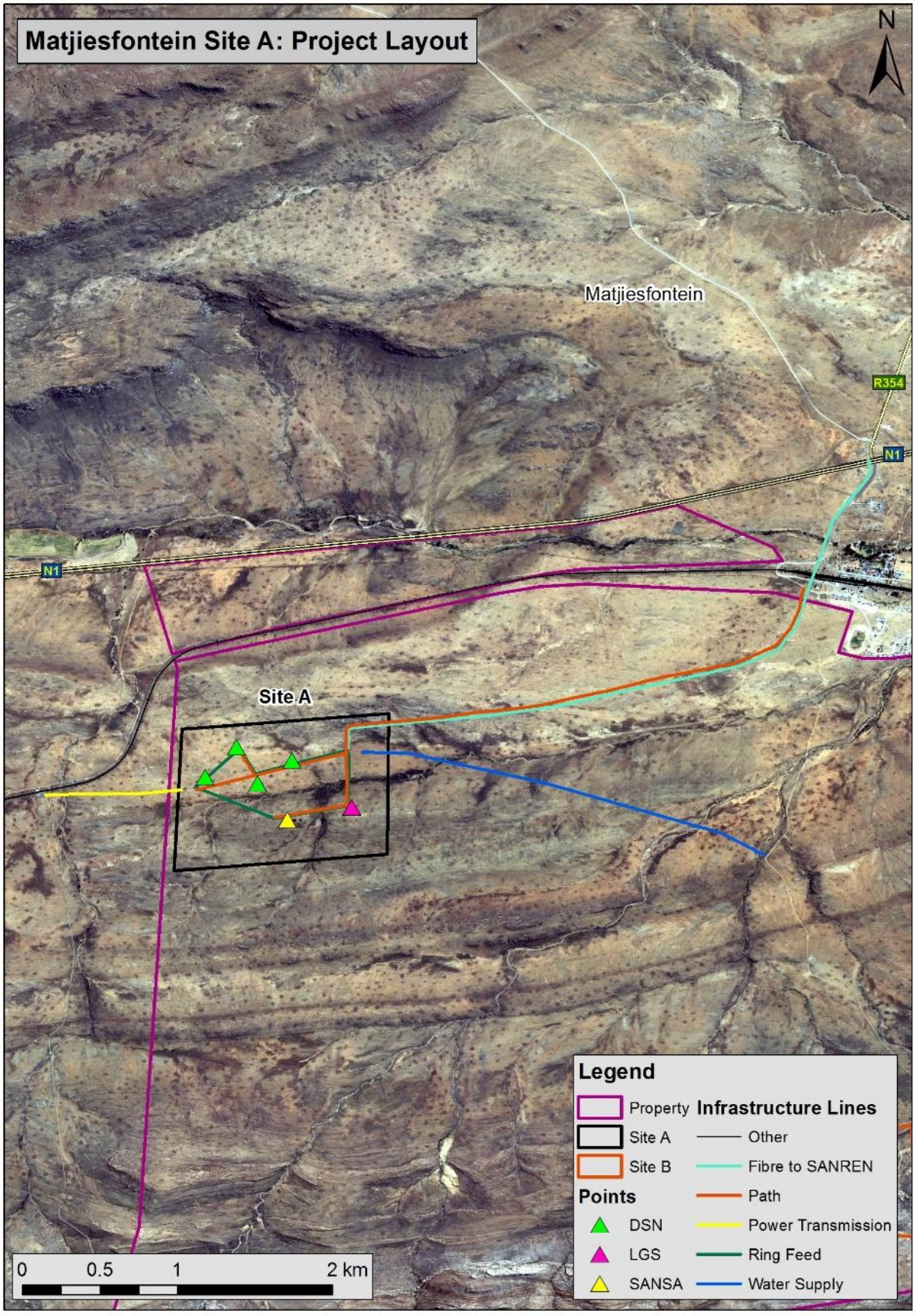
	SITE B					
SEWERAGE AND WASTEWATER GENERATION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	STUDY AREA	MODERATE	MAY OCCUR	MODERATE-
NOISE	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	LOCALISED	SLIGHT	MAY OCCUR	LOW0-
EMPLOYMENT CREATION	SITE A, ALTERNATIVE 1 SITE A, ALTERNATIVE 2 (PREFERRED) SITE B	MEDIUM	NATIONAL	SLIGHT	MAY OCCUR	LOW+

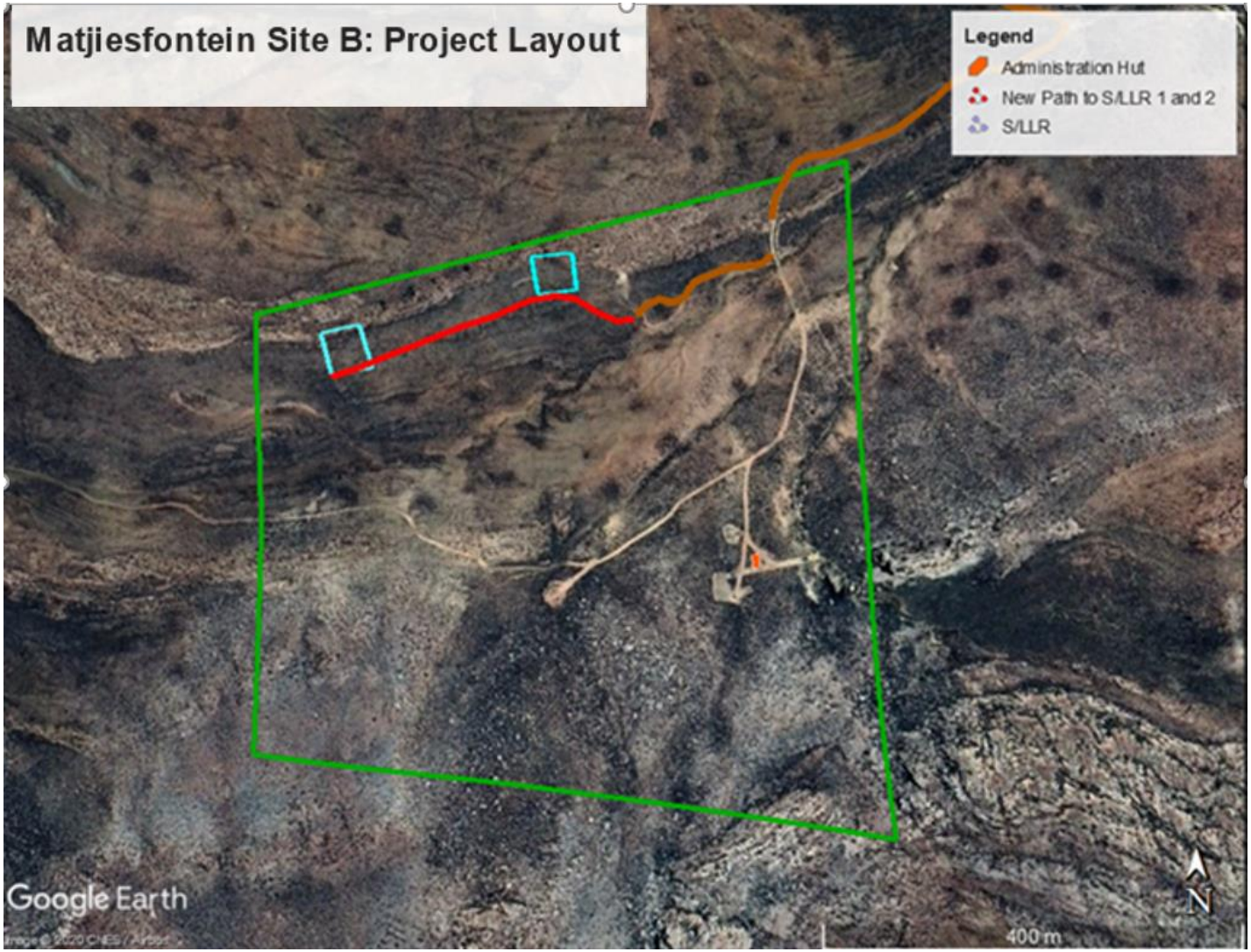
APPENDIX A LOCALITY MAP



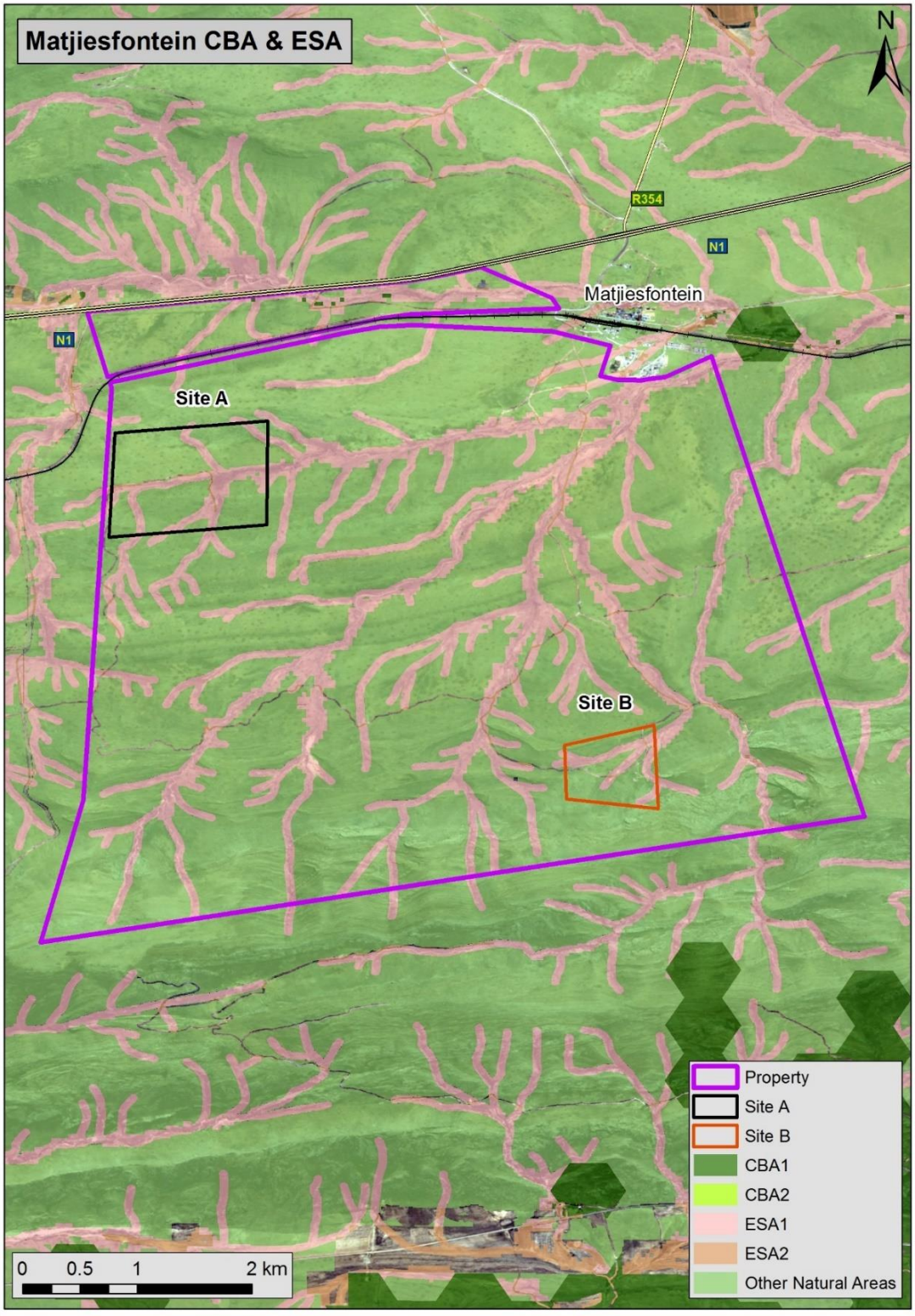
APPENDIX B: THE PROPOSED DEVELOPMENT SITE LAYOUT




Matjiesfontein Site A: Project Layout
N
Matjiesfontein
R354
N1
N1
Site A
Legend
Property
Site A
Site B
Points
DSN
LGS
SANSA
Infrastructure Lines
Other
Fibre to SANREN
Path
Power Transmission
Ring Feed
Water Supply
0
0.5
1
2 km


Matjiesfontein Site B: Project Layout
Legend
Administration Hut
New Path to S/LLR 1 and 2
S/LLR
Google Earth
400 m
N

APPENDIX C: BIODIVERSITY OVERLAY MAP



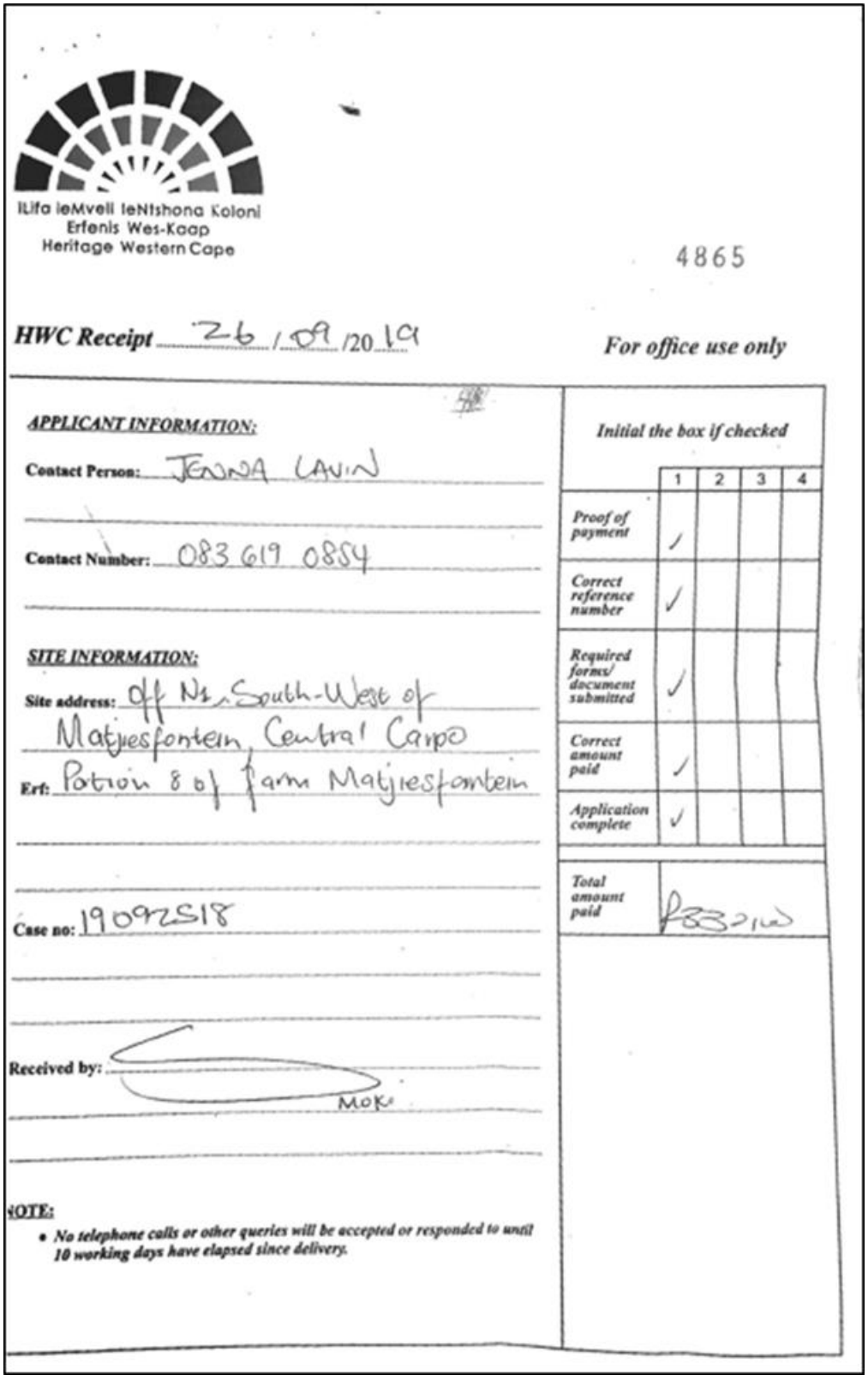
APPENDIX D: PHOTOGRAPHS

Site A2. 2019 Coordinate: 33°14'21.82"S; 20°34'2.42"E.

Site B. Coordinate: 33°16'0.03"S, 20°34'49.88"E.

APPENDIX E: HERITAGE PROOFS

APPENDIX E1: PROOF OF NID SUBMISSION TO HWC:



iLifa leMveli leNtshona Koloni
Erfenis Wes-Kaap
Heritage Western Cape

4865

HWC Receipt 26/09/2019

For office use only

APPLICANT INFORMATION:

Contact Person: JENNA LAVIN

Contact Number: 083 619 0854

SITE INFORMATION:

Site address: Off N7, South-West of Matjiesfontein, Central Carpo

Erf: Portion 8 of farm Matjiesfontein

Case no: 19092518

Received by: MOK

Initial the box if checked	1	2	3	4
Proof of payment	✓			
Correct reference number	✓			
Required forms/ document submitted	✓			
Correct amount paid	✓			
Application complete	✓			
Total amount paid	R3300			

NOTE:

- *No telephone calls or other queries will be accepted or responded to until 10 working days have elapsed since delivery.*

APPENDIX E2:COPY OF COMMENT FROM HWC

iLifa leMveli leNtshona Koloni
Ifranis Wes-Kaap
Heritage Western Cape

Our Ref: HM/ CENTRAL KAROO/ LAINGSBURG/ MATJIESFONTEIN/ ERVEN 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 70, 8/148, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 62, 64, 65, 66, 34, 37, 38, 39, 42 48, 49, 61, 63, 67, 72, 75, 185, 270, 282 AND 1/150
Case No.: 19092518WD0926E
Enquiries: Waseefa Dhansay
E-mail: waseefa.dhansay@westerncape.gov.za
Tel 021 483 9533
Date: 22 October 2019

Matjiesfontein Village (pty) ltd
c/o Lord Milner Hotel
Matjiesfontein
6901

RESPONSE TO NOTIFICATION OF INTENT TO DEVELOP: HIA REQUIRED
In terms of Section 38(2) of the National Heritage Resources Act (Act 25 of 1999) and the Western Cape Provincial Gazette 6061, Notice 298 of 2003

NOTIFICATION OF INTENT TO DEVELOP: THE PROPOSED SANSA SPACE OPERATIONS ALONG WITH ASSOCIATED INFRASTRUCTURE LOCTAED ON ERVEN 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 70, 8/148, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 40, 41, 43, 44, 45, 46, 47, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 62, 64, 65, 66, 34, 37, 38, 39, 42, 48, 49, 61, 63, 67, 72, 75, 185, 270, 282 AND 1/150, MATJIESFONTEIN, CENTRAL KAROO, WESTERN CAPE, SUBMITTED IN TERMS OF SECTION 38(1) OF THE NATIONAL HERITAGE RESOURCES ACT (ACT 25 OF 1999)

The matter above has reference.

Heritage Western Cape is in receipt of your application for the above matter received on 26 September 2019. This matter was discussed at the Heritage Officers Meeting (HOMS) meeting held on 21 October 2019.

You are hereby notified that, since there is reason to believe that proposed SANSA Space Operations along with associated infrastructure in Matjiesfontein will impact on heritage resources, HWC requires that a Heritage Impact Assessment (HIA) that satisfies the provisions of section 38(3) of the NHRA be submitted.

The following specialist studies are required:

- Archaeological study
- Paleontological study
- Impacts to the general cultural landscape within a visual impact assessment
- The comments of relevant registered conservation bodies, interested and affected parties, and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.

The comments of relevant registered conservation bodies and the relevant Municipality must be requested and included in the HIA where provided. Proof of these requests must be supplied.
HWC reserves the right to request additional information as required.

Applicants are strongly advised to review and adhere to the time limits contained the Standard Operational Procedure between the DEADP and HWC.

Should you have any further queries, please contact the official above and quote the case number.

Yours faithfully,

Dr. Mxolisi Dlamuka
Chief Executive Officer, Heritage Western Cape

www.westerncape.gov.za/cas

Street Address: Private Bag X9067, Cape Town, 8000 • Postal Address: Private Bag X9067, Cape Town, 8000
• Tel: • E-mail:
Straatadres: Privaat Sak X9067, Kaapstad, 8000 • Posadres: Privaatsak X9067, Kaapstad, 8001
• Tel: • E-pos:

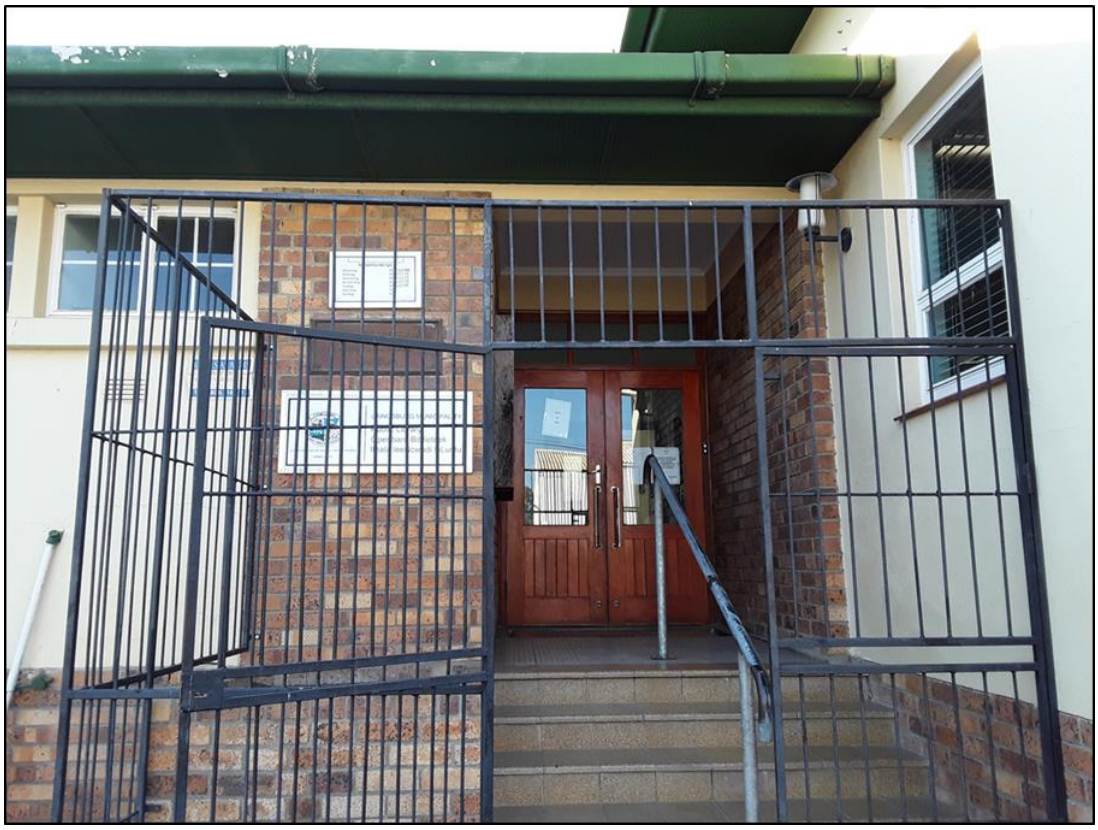
APPENDIX F: PUBLIC PARTICIPATION DOCUMENTS

APPENDIX F1:SITE NOTICES:

Site Notice Placed on the gate at the entrance to the site

Coordinates: 33°13'52.52"S; 20° 34'36.14"E

APPENDIX F2:INCEPTION POSTERS:

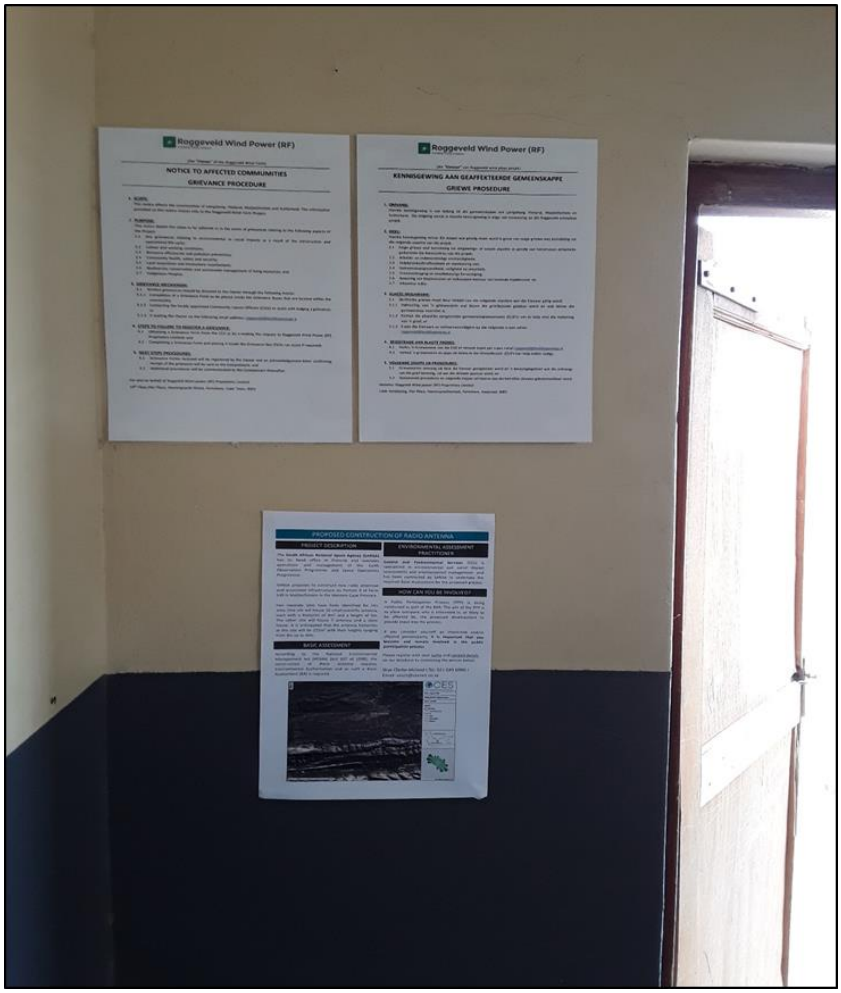


Laingsburg Public library

Laingsburg Library Notice Board

Laingsburg Municipal Office

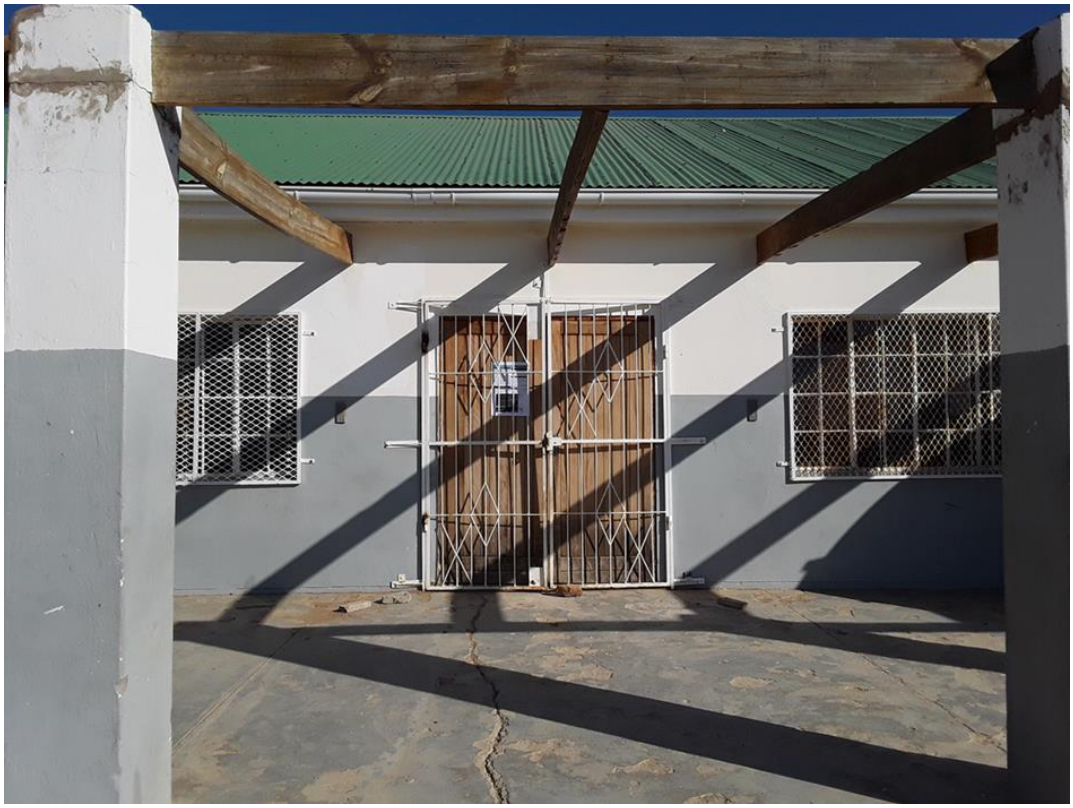
Close up of poster in window of Laingsburg Municipal Office



Inside Matjiesfontein Community Centre

Majiesfontein Mini-Library window

Matjiesfontein Sports Field



Matjiesfontein Sports Club House (Poster on door)

APPENDIX F3: LIST OF INTERESTED AND AFFECTED PARTIES

Name	Affiliation
CES	
Anthony Mark Avis	CES
Tarryn Martin	CES
Skye Clarke-Mcleod	CES
Applicant	
Raoul Hodges	The South African National Space Agency
Land Owners	
Jon Rawdon- Matjiesfontein Village(PTY) Ltd	
Neighbours	
The Lord Milner Hotel	Matjiesfontein Village
Abie Apollis	ERF 28
Kaitlyn Thenissen	ERF 29
Hendrik Louw	ERF 30
EMPTY PLOTS	ERF 32&31
Martha Horne	ERF 33
Sheryldene Pearce	ERF 34
Hannelie Willemse	ERF 35
Anna Johanna Solomon	ERF 36
Katie McKeet (Community Leader)	ERF 37&38
Iris Van Schalkwyk	ERF 39
Mitchel Cupido	ERF 40
Roleen Dewee	ERF 41
Jennifer Anne Hart	1/150 Besten Weg also Jantesfontein ERF 164
Sumari Galhardo, Juna Phillips	Erf 165, Nooitgedacht
Kent Flowers	Erf 165, Nooitgedacht
J Putter	Erf 165, Nooitgedacht
I&APs	

Name	Affiliation
Janine Brasington	Red Rocket Energy
Magdalena Michalowska	Red Rocket Energy
Sharief Harris	Red Rocket Energy
Veronique Fyfe	G7 Renewables
Viv Cronje	Groot Water Private Nature Reserve
Andries du Plessis	WPP Town and Regional Planning Consultants
Rietfontein Nature Resure	Rietfontein Nature Reserve
Organs of State	
Joyene Isaacs	Western Cape Department of Agriculture
Williehelm Theron	Ward Councillor Matjiesfontein
Mr. J Jonkers	Central Karoo District Municipality
Mr. Abri du Toit	Laingsburg Local Municipality
Mr Fabion Smith	Breede Gouritz Catchment Management Agency
Rudzani Makahane, Andiswa Sam	Breede Gouritz Catchment Management Agency
Mr Colin Fordham	Cape Nature
Mr Solly Fourie	Department of Economic Development and Tourism
Mr Shanisani Munzhedzi	DEFF: Biodiversity and conservation
Danie Swanepoel	DEADP, George Office
Adri La Meyer	DEADP, Cape Town Departmental Contact
Waseefa Dhansay	Heritage Western Cape
Andrew Salomon	SAHRA
Evelyn Shogoe	Aviation Environmental Protection Specialist
Lizell Stroh	Obstacle Inspector (CAA)
John Geeringh	ESKOM
Cobus Theron	EWT Drylands Conservation
Dr Roelf Botha	Head of the SARAO geodesy group
Justin Jonas	SKA (Square Kilometre Array)

APPENIX F4:NOTIFICATION LETTERS:

Inception Letter sent using registered mail: English and Afrikaans

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

15 November 2019

Dear Interested and Affected party,

NOTIFICATION: BASIC ASSESSMENT FOR THE CONSTRUCTION OF RADIO ANTENNAE FOR THE SOUTH AFRICAN NATIONAL SPACE AGENCY

The South African National Space Agency (SANSA) proposes to construct new radio antennae and associated infrastructure on Portion 8 of Farm 148 near Matjiesfontein in the Western Cape Province in fulfilment of their vision to coordinate and integrate national space science and technology programmes and conduct long-term planning and implementation of space-related activities in South Africa. The antenna will be used to track satellites in orbit.

Two sites have been identified for this area:

- One site will house 20 small scientific antenna with a footprint of 4m2 and height of 3m.
- The second site will house 7 antenna with a footprint of 225m2 and height ranging from 4m up to 40m.
- The second site will also include a store house.
- Associated infrastructure such as Internal, gravel access roads 4m wide.
- Laydown areas.

You are here-by notified of the initiation of a Basic Environmental Assessment being carried out by CES for the above mentioned proposed project. CES has been appointed by SANSA to conduct the Basic Assessment for the proposed development.

For a detailed project description please find enclosed the Background Information Document.

CES would appreciate it, if you could **confirm your receipt** of this notification via email, phone or post.

For more information, please feel free to contact:

Ms Skye Clarke-Mcleod
Tel: (021) 045 0900
E-mail: cesct@cesnet.co.za

Yours sincerely,

Skye Clarke-Mcleod

CES Environmental and Social Advisory Services (Pty) Ltd
T +27 21 045 0900
Block C, the Estuaries
Oxbow Crescent
Century City
Reg no: 2012/151672/07
www.cesnet.co.za
Director: AM Avis.

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

15 November 2019

Beste Belanghebbende en Geaffekteerde party,

KENNISGEWING: BASIESE ONTLEDING VIR DIE KONSTRUKSIE VAN RADIO ANTENNAS VIR DIE SUID AFRIKAANSE NASIONALE RUIMTE AGENTSKAP

Die Suid Afrikaanse Nasionale Ruimte Agentskap (SANRA) stel die konstruksie van nuwe radio antennas en assosieerde infrastruktuur voor op gedeelte 8 van Plaas 148 naby Matjiesfontein in die Wes Kaap Provinsie in die vervulling van van hul visie om die nasionale ruimte wetenskap en tegnologie programme te koördineer en integreer en om lang-termyn beplanning uit te voer vir die ruimte verwante aktiwiteite in Suid Afrika. Die antennas sal gebruik word om satellite in die wenteling na te spoor.

Twee areas is identifiseer in die area:

- Een area sal 20 klein wetenskaplike antennas huisves met 'n 'voetspoor'/omvang van 4m2 en hoogte van 3m.
- Die tweede area sal 7 antennas huisves met 'n 'voetspoor'/omvang van 225m2 en hoogte wat varieer tussen 4m tot 40m.
- Die tweede area sal ook 'n stoorhuis insluit.
- Assosieerde infrastruktuur soos interne grond, toegangs paaie wat 4m wyd sal wees.
- Neerleg / afsettings areas.

U word hiermee in kennis gestel van die inisiatief van 'n Basiese Omgewings Onleding wat uitgevoer gaan word deur CES vir die bogenoemde voorgestelde projek. CES is aangestel deur SANRA om die Basiese Ontleding (Assessering) vir die voorgestelde ontwikkeling uit te voer.

Vir 'n breedvoerige projek beskrywing vind asseblief ingesluit die Agtergrond Informasie Dokument.

CES sal die waardeer, indien u kan **bevestig** dat u die kennisgewing deur middle van e-pos, telefoon of pos diens ontvang het.

Vir meer inligting, voel asseblief vry om die volgende persoon te kontak:

Me Skye Clarke-Mcleod
Tel: (021) 045 0900
E-pos: cesct@cesnet.co.za

Beste wense.

Skye Clarke-Mcleod

CES Environmental and Social Advisory Services (Pty) Ltd
T +27 21 045 0900
Block C, The Estuaries, Oxbow Crescent, Century City
Reg no: 2012/151672/07
www.cesnet.co.za

Director: AM Avis.

APPENDIX F5:BACKGROUND INFORMATION DOCUMENT SENT TO I&AP'S: ENGLISH AND AFRIKAANS

BASIC ASSESSMENT FOR THE CONSTRUCTION OF RADIO ANTENNAE FOR THE SOUTH AFRICAN NATIONAL SPACE AGENCY

BACKGROUND INFORMATION DOCUMENT
&
INVITATION TO COMMENT

Return address for comments:
CES
Skye Clarke-Mcleod
Block C, The Estuaries
Oxbow Crescent
Century City
7441
Tel: 021 045 0900
Email: cesct@cesnet.co.za

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

AIM OF THIS DOCUMENT

The purpose of this document is to ensure that people interested in or affected by the proposed project are provided with information about the proposal, the process being followed and provided with an opportunity to be involved in the environmental assessment process.

Registering as an Interested and/or Affected Party (I&AP) allows individuals or groups the opportunity to contribute ideas, issues, and concerns regarding the project. I&APs also have an opportunity to review all reports and submit comments on those reports. All comments received are included in the reports submitted to the Competent Authority.

THE PROPONENT

The South African National Space Agency (SANSA) has its head office in Pretoria which oversees operations and management of the Earth Observation Programme and Space Operations Programme (currently based in Hartebeeshoek in the Gauteng Province). SANSA appointed CES as the Environmental Assessment Practitioner to apply for Environmental Authorisation. SANSA's research focuses on space science, engineering and technology that can promote development, build human capital and provide important national services.

THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

CES is specialised in environmental and social impact assessments and environmental management and has been appointed by SANSA to conduct the required Basic Assessment for the proposed project. CES was established in 1990 when they were involved as lead consultants for a large mineral mining Environmental Impact Assessment (EIA) in South Africa, and since completing that first EIA, have expanded their scope of work to provide a wide variety of environmental and social advisory services to public and private-sector clients both within South Africa and internationally.

PROJECT DESCRIPTION

SANSA proposes to construct new radio antennae and associated infrastructure on Portion 8 of Farm 148 near Matjiesfontein in the Western Cape Province.
Two separate sites have been identified for this project. One site will house 20 small scientific antenna, each with a footprint of $4m^2$ and a height of 3m. The other site will house 7 antenna and a store house. It is anticipated that the antenna footprints at this site will be $225m^2$ with their heights ranging from 4m up to 40m.
Other associated infrastructure will include internal, gravel access roads that are 4m wide as well as laydown areas.

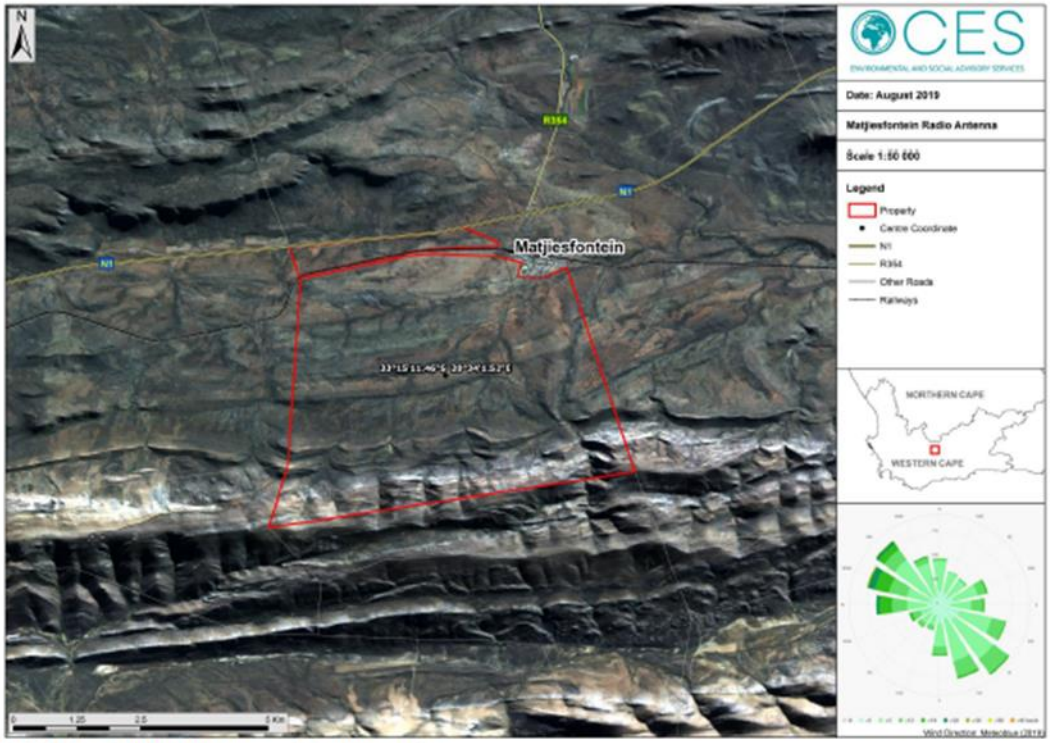


FIGURE 1: Locality Map of the proposed development site

RELEVANT LEGISLATION

The Environmental Impact Assessment (EIA) regulations and government listings specify which development activities require either a Basic Assessment (Listing Notice 1 and 3), or a full Scoping and EIA (Listing Notice 2). Generally, Basic Assessments are required for lower impact projects, whereas full Scoping and EIA are reserved for higher impact projects.

The proposed project is subject to a Basic Assessments in terms of the following activity:

Activity Number	Activity	Project component triggering activity
	Listing Notice 3 (GNR 324)	
3	The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) Is to be placed on a site not previously used for this purpose; and (b) Will exceed 15 metres in height (i) Western Cape (i) All areas outside urban areas	(a) Virgin ground (b) radio antennae will be up to 40m
4	The development of a road wider than 4 metres with a reserve less than 13,5 meters (i) Western Cape (ii) Areas outside urban areas; (aa) Areas containing indigenous vegetation	New gravel roads are to be developed and existing roads are to be upgraded
12(i)	The clearance of an area of 300 square meters or more of indigenous vegetation (i) Western Cape	Total combined footprint for clearance is 1655m²
14(xii)(i)(i)	The development of (xii) infrastructure or structures with a physical footprint of 10 square meters or more; where such development occurs- if no development setback has been adopted, within 32 meters of a watercourse, measured from the edge of a watercourse (i) Western Cape (i) Outside urban areas	A riverbed occurs within 32m of the south east corner of the site closest to Matjiesfontein.

APPROACH TO THIS BASIC ASSESSMENT REPORT

The BA for the proposed project is presently in the planning phase. This phase serves primarily to inform the public and relevant authorities about the proposed project and to determine any impacts. These impacts will then be extensively addressed during the environmental impact assessment studies. Only after the full Basic Assessment Report has been submitted will the relevant authorities make a decision.

A Draft Basic Assessment Report (dBAR) will be compiled which will comprehensively describe the activities and impacts that the project may have on the receiving environment, including specialist reports and details from the PPP process. The dBAR and Environmental Management Programme (EMPr) will be submitted for a 30 day public comment period.

Subsequent to the review and commenting period, a Final BAR will be compiled for submission to the Department of Environmental Affairs and Development Planning (DEA&DP). This will include all public comments and response to issues raised by I&APs.

Should the authorities grant approval via an environmental authorisation, all registered I&APs will be notified accordingly and given the opportunity to appeal against the decision, should they so wish.

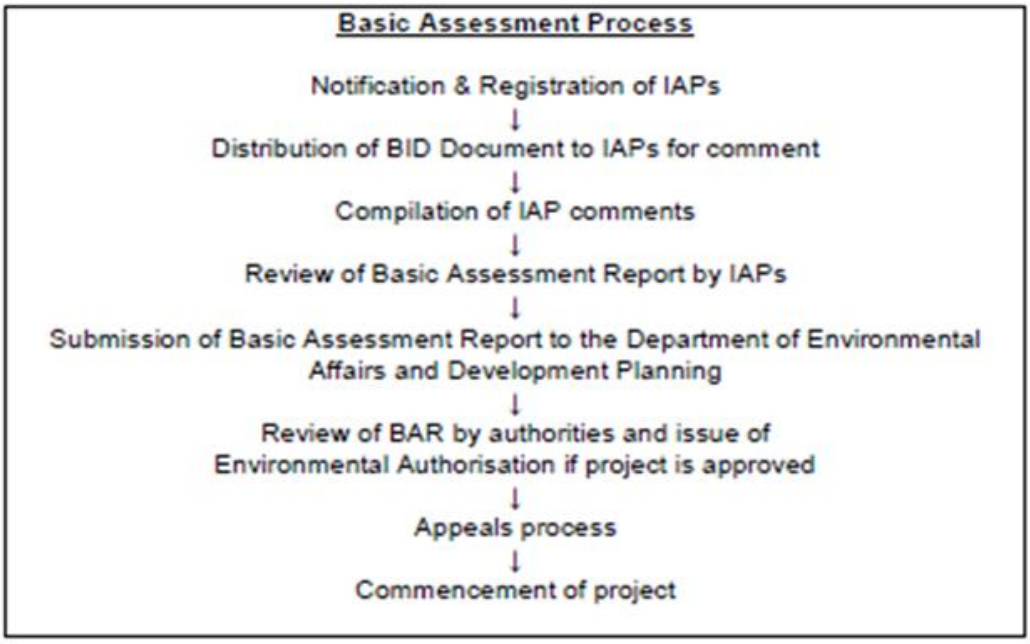


FIGURE 3: Proposed Basic Assessment Process Including Public Participation.

POTENTIAL IMPACTS AND BENEFITS

The following specialist studies will be conducted to ascertain any potential impacts, positive and negative, that may occur as a result of the potential authorization of the project, and to propose mitigation measures for the construction and operation phases:

- Ecological impact assessment
- Heritage impact assessment

HOW CAN YOU BE INVOLVED?

A Public Participation Process (PPP) is being conducted as part of the BAR. The aim of the PPP is to allow everyone who is interested in, or likely to be affected by, the proposed development to provide input into the process.

The Public Participation Process will include:

- Advertisements in the local newspapers;
- Notice Boards on site;
- Circulation of the BID (this document) to all I&APs and stakeholders;
- Registration of all I&APs and stakeholders;
- Review of all comments by registered I&APs and stakeholders.

If you consider yourself an interested and/or affected person/party, **it is important that you become and remain involved in the public participation process.** In order to do so please follow the steps below in order to ensure that you are continually informed of the project developments and will ensure your opportunity to raise issues and concerns pertaining to the project.

STEP 1: Please **register** by responding to our notification and invitation, with your name and contact details (details provided on cover page and below). As a registered I&AP you will be informed of all meetings, report reviews and project developments throughout the EIA process.

STEP 2: Please send us any comments, concerns or queries you may have in relation to the proposed road upgrade activities.

STEP 3: Attend meetings that will be held throughout the BAR process. As a registered I&AP, you will be invited to these meetings.

CES is required to engage with all private and public parties that may be interested and/or affected by the proposed road upgrade BAR, in order to distribute information for review and comment in a transparent manner.

In the same light, it is important for I&APs to note the following:

1. In order for CES to continue engaging with you, please **ENSURE** that you register on our database by contacting the person below.
2. As the BAR process is regulated by specific review and comment timeframes, it is your responsibility to submit your comments within these timeframes.

If you would like to be kept up to date with the Basic Assessment process for this project please send your contact details to:

Skye Clarke-Mcleod

Tel: 021 045 0900

cesct@cesnet.co.za

BASIESE ONTLEDING VIR DIE KONSTRUKSIE VAN RADIO ANTENNAS VIR DIE SUID AFRIKAANSE NASIONALE RUIMTE AGENSTSKAP

AGTERGROND INLIGTING DOKUMENT
&
UITNODIGING VIR KOMMENTAAR

TERUGVOER ADRES VIR KOMMENTAAR:
CES
Skye Clarke-Mcleod
Block C, The Estuaries
Oxbow Crescent
Century City
7441
Tel: 021 045 0900
E-pos: cesct@cesnet.co.za

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

DOEL VAN DIE DOKUMENT

Die doel van die dokument is om te verseker dat mense wat belangstellend of affekteer is deur die voorgestelde projek, voorsien word van informasie aangaande die voorstel, die proses wat gevolg word en die geleentheid gegee word om betrokke te raak in die omgewings ontledings proses.

Registrasie as 'n Belanghebbende en/of Geaffekteerde Party (B&GP) laat individue of groepe toe om bydrae te lewer met idees, aangeleenthede en bekommernisse aangaande die projek. B&GPe het ook die gleentheid om al die verslae te hersien en om kommentaar in te dien. Alle kommentaar ontvang word ingesluit in die verslae wat ingedien word by die Bevoegde Owerheid.

DIE VOORSTELLER

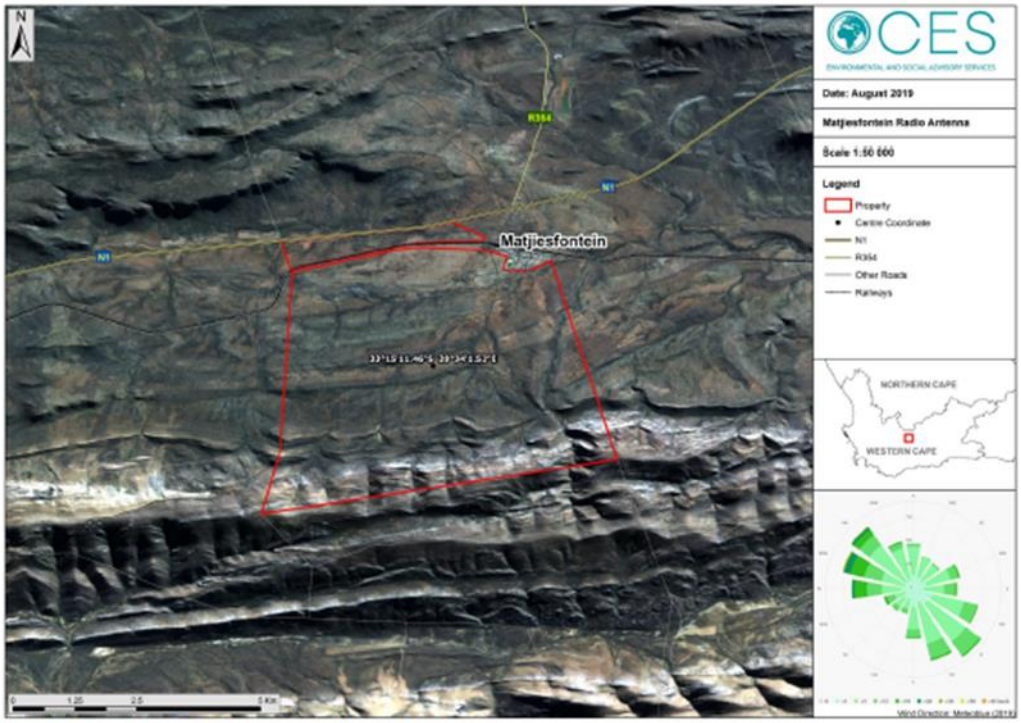
Die Suid Afrikaanse Nasionale Ruimte Agentskap (SANRA) het 'n hoof kantoor in Pretoria, wat toesig hou oor bedrywighede en bestuur van die Aarde Observasie Program en Ruimte Bedrywighede Programme (tans baseer in Hartebeeshoek in die Gauteng Provinsie). SANRA het CES aangestel as die Omgewings Ontledings Praktisyn om aansoek te doen vir die Omgewings Goedkeuring. SANRA se navorsing focus op ruimte, ingenieurswese en tegnologie wat ontwikkeling kan bevorder, menslike kapitaal kan bou en belangrike nasionale dienste te voorsien.

DIE OMGEWINGS ONTLEDINGS PRAKTISYN

CES spesialiseer in omgewings en sosiale impak ontledings sowel as omgewings bestuur en is aangestel deur SANRA om die vereiste Basiese Ontleding (Assessering) uit te voer vir die voorgestelde projek. CES is gestig in 1990 toe hulle betrokke was as toonaangewende konsultante vir 'n groot minerale myn se Omgewings Impak Ontelding (OIO) in Suid Afrika, en sedert die voltooing van daardie eerste OIO, het hulle omvang van werk uitgebrei om 'n wye verskeindenheid van omgewings en sosiale adviesdienste aan die publiek en privaat sektor kliënte beide in Suid Afrika en internasionaal te voorsien.

PROJEK BESKRYWING

SANRA stel 'n konstruksie van nuwe radio antennas en assosieerde infrastruktuur voor op Gedeelte 8 van Plaas 148 naby Matjiesfontein in die Wes Kaap Provinsie. Twee aparte areas is identifiseer vir hierdie projek. Een area sal 20 klein wetenskaplike antennas huisves, elk met 'n voetspoor ("footprint") van 4m^2 en 'n hoogte van 3m. Die ander area sal 7 antennas huisves sowel as 'n stoorhuis. Dit word verwag dat die antenna voetspoor by die area 225m^2 sal wees met 'n hulle hoogtes wat wissel tussen 4m tot 40m. Ander assosieerde infrastruktuur sal insluit interne grond, toegangs paaie wat 4m wyd sal wees sowel as neerleg/berg areas.



FIGUUR 1: Liggings Kaart van die voorgestelde ontwikkeling area

RELEVANTE WETGEWING

Die Omgewings Impak Ontleding (OIO) regulasies en regerings lyste spesifiseer watter ontwikkeling aktiwiteite of 'n Basiese Ontleding (Lys Kennisgewing 1 en 3) vereis, of 'n volledige Omvang Bepaling en Omgewings Impak Ontleding (Lys Kennisgewing 2). Gewoonlik, word Basiese Ontledings vereis vir laer impak projekte, waar volle Omvang Bepaling en Omgewings Impak Ontledings (OIO) reserveer word vir hoë impak projekte.

Die voorgestelde projek is onderhewig aan 'n Basiese Ontleding in terme van die volgende aktiwiteit:

Aktiwiteit Nommer	Aktiwiteit	Projek komponent aktiveer aktiwiteit
Lys Kennisgewing 3 (GNR 324)		
3	Die ontwikkeling van maste of torings van enige material of tipe gebruik vir telekommunikasie uitsaai of radio transmissie doeleindes waar die mas of toring - (a) Moet op 'n plek geplaas word wat nie voorheen vir die doel gebruik is nie; en (b) Sal 15 meter in hoogte oorskry (i) Wes Kaap (i) Alle areas buite stedelike areas	(a) Ongebruikte grond (b) radio antennas sal tot 40m wees
4	Die ontwikkeling van 'n pad wyer as 4 meter met 'n reserwe minder as 13.5 meter. (i) Wes Kaap (ii) Areas buite stedelike areas (aa) Areas wat inheemse plantegrei bevat	Nuwe grond paaie moet ontwikkel word en bestaande paaie moet opgradeer word.
12(i)	Die opruiming van 'n gebied van 300 vierkante meter of meer van inheemse plantegroei (i) Wes Kaap	Totale kombineerde voetafdruk/spoor vir opruiming is 1655m²
14(xii)(i)(i)	Die ontwikkeling van (xii) infrastruktuur of structure met 'n fisiese voetafdruk van 10 vierkante meter of meer; waar so 'n ontwikkeling plaasvind-indien geen ontwikkeling terugslae aangeneem is nie, binne 32 meter van 'n waterloop, gemeet van die kant van 'n waterloop (i) Wes Kaap (i) Buite stedelike areas	'n Rivierbed plaas vind 32m vanaf die suid oos hoek van die area naaste aan Matjiesfontein.

BENADERING TOT DIE BASIESE ASSESSERINGS - ONTLEDINGS VERSLAG

Die BA (Basiese Assesserings verslag) vir die voorgestelde projek is tans in die beplannigs fase. Hierdie fase dien hoofsaaklik as informasie vir die publiek en relevante owerhede aangaande die voorgestelde projek en om moontlike impakte te bepaal. Hierdie impakte sal dan breedvoerig aangespreek word gedurende die omgewings impak ontledings studies. Slegs na die volledige Basiese Ontledings Verslag in gedien is, sal die relevante owerhede 'n besluit neem.

'n Konsep Basiese Assesserings Verslag (kBAV) sal saamgetel word wat breedvoerig sal beskryf wat die aktiwiteite en impakte sal wees wat die projek mag behels, op die ontvangende omgewing, ingesluit spesialis verslae en besonderhede van die PDP proses. Die Kbav en die OBPv (Omgewings Bestuur Program Verslag) sal uitgereik/publiseer word vir 'n 30 dae publieke kommentaar lewerings periode.

Daaropvolgend na die hersiening en kommentaar lewerings periode, sal 'n Finale BOV saamgestel word vir indiening by die Departement van Omgewing Sake en Ontwikkeling Beplanning (DOS&OB). Dit sal al die publieke kommentaar en reaksies tot aangeleenthede uitgelig deur B&GPe; insluit.

Indien die owerhede goedkeuring gee deur middle van die omgewings goedkeuring, sal al die B&GPe sodoende ingelig word en die geleentheid gegee word om appèl te maak teen die besluit, indien hulle dit wil doen.

FIGUUR 3: Die voorgestelde Basiese Assesserings Proses insluitend die Publieke Deelname .

POTENSIËLE IMPAKTE EN VOORDELE

Die volgende spesialis studies sal uitgevoer word om te bepaal of daar enige potensiële impakte is, positief en negatief, wat moontlik mag plaasvind as 'n gevolg van die ptensiële goedkeuring van die projek; en om voorgestelde versagtende maatreëls vir die konstruksie in bedryfs fases in te stel:

- Ekologiese impak assessering
- Erfenis impak assessering

HOE KAN U BETROKKE WEES?

'n Publieke Deelname Proses (PDP) word uitgevoer as deel van die BAV. Die doel van die PDP is om almal wat belangstel of behoort affekteer te word deur die voorgestelde ontwikkeling, toe te laat om bydrae en insette te lewer tot die proses.

Die Publieke Deelname Proses sal die volgende insluit:

- Advertensies in die plaaslike koerante;
- Kennisgewing borde by die aanleg/area;
- Verspreiding van die BID (hierdie dokument) na alle B&GPe en belanghebbendes;
- Registrasie van alle B&GPe en belanghebbendes;
- Hersiening van alle kommentaar deur geregistreerde B&GPe en belanghebbendes.

Indien u, jouself as 'n belanghebbende en/of geaffekteerde persoon/party, beskou, is **dit belangrik dat u betrokke raak en bly in die publieke deelname proses.**

Om sodoende betrokke te raak, volg asseblief die stappe hier onder om seker te maak dat u voortdurend ingelig word van projek ontwikkelings en sal u geleentheid verseker om aangeleenthede uit te lig en bekommernisse tot die projek bekend te maak.

STAP 1: **Registreer** asseblief deur te reageer op die kennisgewing en uitnodiging, met u naam en kontak besonderhede (soos uitgelig op die dekblad en hier onder). As 'n registreerde I&AP sal u ingelig word van alle vergaderings, verslag hersienings en projek ontwikkelings deurgans tot die OIO proses.

STAP 2: Stuur asseblief vir ons enige kommentaar, besorgdhede of navrae wat u mag hê in verband met die voorgestelde pad opgraderings aktiviteite.

STAP 3: Woon vergaderings by deurgans tot die BOV (Basiese Ontledings Verslag) proses.

CES word vereis om in verbeinding te wees met alle private en publieke partye wat belanghebbend of geaffekteer mag word deur die voorgestelde pad opgraderings BOV, om ons sodoende instaat te stel om informasie vir hersiening en kommentaar te versprei op 'n deursigtige wyse.

In dieselfde lig, is dit belangrik vir B&GP to note the following:

1. Om CES in staat te stel om op 'n volgehoue basis met u in aanraking te bly, **VERSEKER** asseblief dat u op die databasis registreer deur die persoon hier onder te kontak.
2. Soos wat die BOV proses reguleer word deur spesifieke hersiening en kommentaar tydsraamwerke, is dit u verantwoordelikheid om kommentaar in te dien binne die tydsraamwerke.

Indien u ingelig wil bly met die Basiese Ontledings proses vir die projek, stuur asseblief u kontak besonderhede na:

Skye Clarke-Mcleod

Tel: 021 045 0900

E-pos: cesct@cesnet.co.za

Updated Background Information Document (English and Afrikaans) Sent 17 October 2020

BASIC ASSESSMENT FOR THE CONSTRUCTION OF RADIO ANTENNAE FOR THE SOUTH AFRICAN NATIONAL SPACE AGENCY

BACKGROUND INFORMATION DOCUMENT
&
INVITATION TO COMMENT

Return address for comments:
CES
Elta House, 3rd floor, 3 Caledonian Rd,
Mowbray, Cape Town, 7700

Skye Clarke-Mcleod
Tel: 021 045 0900
Email: cesct@cesnet.co.za

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

AIM OF THIS DOCUMENT

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Registering as an **Interested and/or Affected Party** (I&AP) allows individuals or groups the opportunity to **contribute ideas, issues, and concerns regarding the project**. I&APs also have an opportunity to **review all reports and submit comments** on those reports. All comments received are included in the reports submitted to the Competent Authority.

THE PROPONENT

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PROJECT DESCRIPTION

SANSA proposes the construction of radio antennae and associated infrastructure on portion 8 of farm 148, near Matjiesfontein in the Western Cape in fulfilment of their vision to coordinate and integrate national space science and technology programmes and conduct long-term planning and implementation of space-related activities in South Africa.

In 2019, another area within the property portion was assessed, located 1km from Matjiesfontein. The results of the Cultural Landscape Impact Assessment undertaken showed a high visual intrusion to the National Heritage Site of Matjiesfontein Village. Due to these results, the site was deemed unsuitable for development and the proponent changed the location to seek an area with reduced impacts. The new proposed site is approximately 3.3km from Matjiesfontein.

The project will consist of four Deep Space Navigation antennae of up to 45m in height, each with a physical footprint of 360m², one Ku-antennae of up to 30m in height with a corresponding footprint of 400m² and three smaller SANSA antennae of up to 12m in height, each with a footprint of 100m².

Other infrastructure includes 4m wide, gravel access roads, a guard house, an operations building of 525m², two gravel parking areas of 900m², ablution facilities, water storage for fire management and a conservancy tank for temporary sewerage and grey water storage.

The proponent also requires an electrical power station onsite with an overhead transmission line connecting to the Eskom substation 750m away. The power station will house generators and stored diesel in self-bunded containers and will also house a workshop and storage area, being of similar size to the main operations building.

Water will be sourced from the municipal point and supplemented by the drilling of an onsite borehole. Fibre lines will run below ground in PVC ducting to the site in order to service the antennae, with PVC manholes at 50m intervals. The site boundary will be fenced according to national key point standards. Site B will house 2 scientific instruments known as short/long laser rangers (S/LLR) , each with a footprint of 14.2m² (the size of a Shipping container) and an administration booth with a footprint of 9m² (3mX3m). Solar panels will form part of the roofing of the infrastructure in order to supply power to the equipment. The scientific instruments will each be individually fenced by a standard 3m high, 10m x10 diamond mesh fence with flat rap at the top. The existing access roads to this site will remain unchanged, however new internal gravel roads, 4m wide, will be needed to access the infrastructure

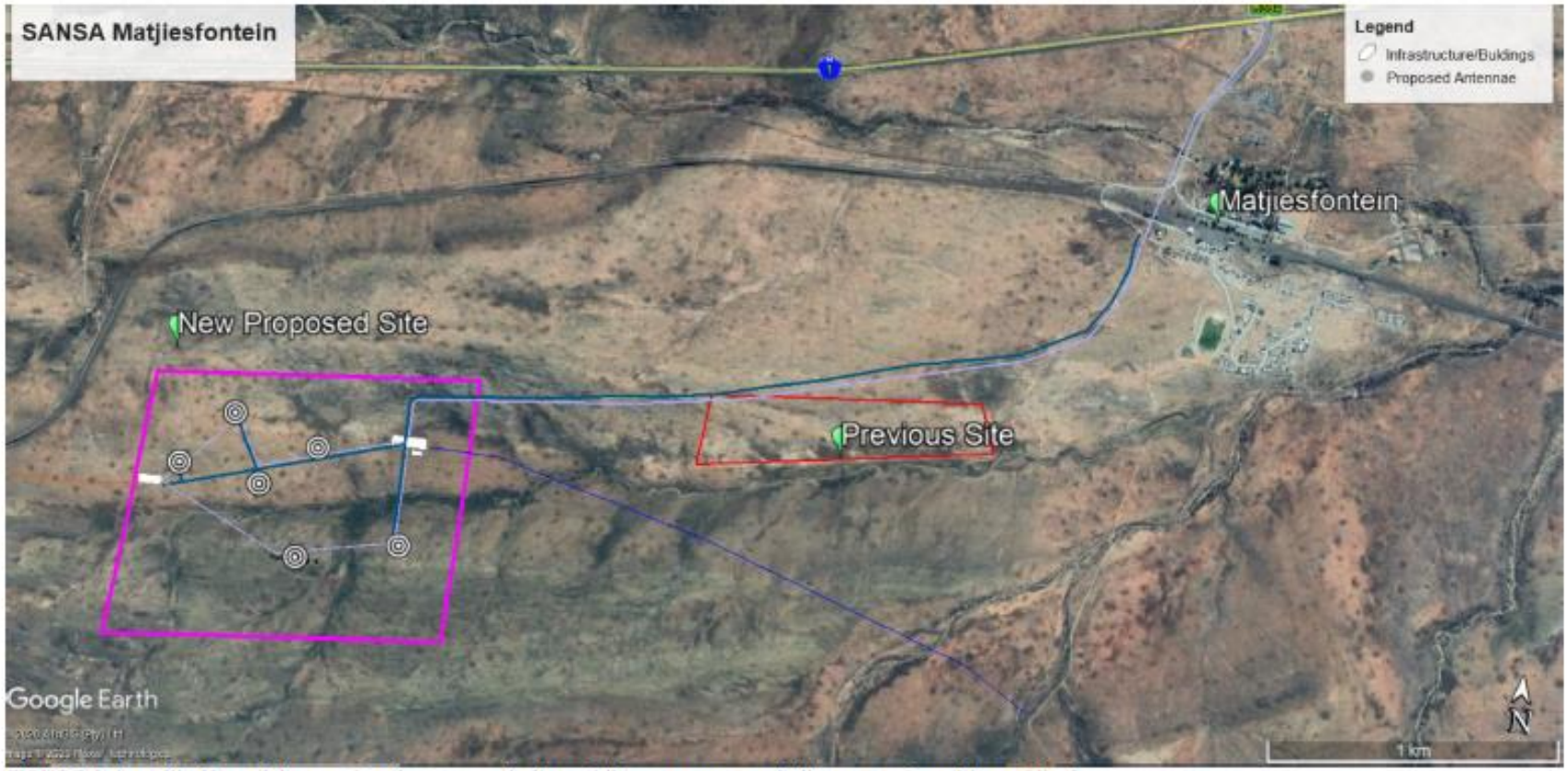


FIGURE 1: Locality Map of the previously assessed site and the new proposed site, now referred to as Site A

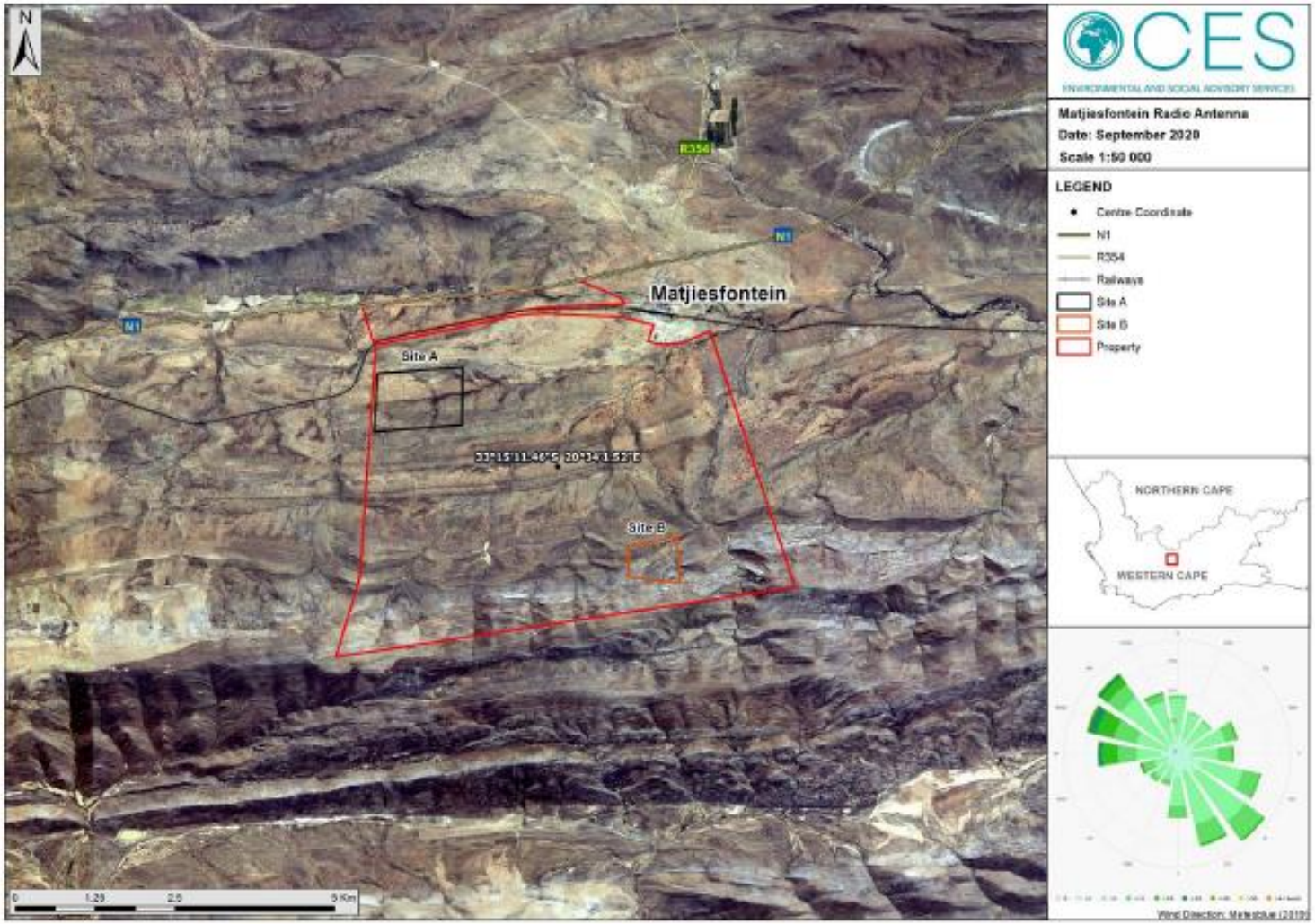


Figure 2:Site A and Site B, Matjiesfontein proposed sites

RELEVANT LEGISLATION

The Environmental Impact Assessment (EIA) regulations and government listings specify which development activities require either a Basic Assessment (Listing Notice 1 and 3), or a full Scoping and EIA (Listing Notice 2). Generally, Basic Assessments are required for lower impact projects, whereas full Scoping and EIA are reserved for higher impact projects.

The proposed project is subject to a Basic Assessments in terms of the following activity:

Activity Number	Activity	Project component triggering activity
	Listing Notice 1 (GNR 327)	
12	The development of – (ii) infrastructure or structures with a physical footprint of 100 square metres or more; (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	The combined physical footprint of the development is approximately 33 738m² and some infrastructure, such as the fencing, will be located within 32m of a watercourse.
14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	The proponent intends on storing 4 self-bunded containers of diesel, each with a capacity of 70 000l. Total 280 cubic metres
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation,	Including new roads 3.37 ha is anticipated for clearing
	Listing Notice 3 (GNR 324)	
3	The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) Is to be placed on a site not previously used for this purpose; and (b) Will exceed 15 metres in height (i) Western Cape (i) All areas outside urban areas	The radio antenna will be up to 45m in height and located on a greenfields site.

4	The development of a road wider than 4 metres with a reserve less than 13,5 meters (i) Western Cape (ii) Areas outside urban areas; (aa) Areas containing indigenous vegetation	New gravel roads are to be developed and existing roads are to be upgraded, they will be 4m in width. Compacted and covered in a layer of gravel
10	The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. i. Western Cape ii. All areas outside urban areas;	The proposed development is outside the urban area
18 (i)	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. (i) All areas outside urban areas (aa) Areas containing indigenous vegetation;	Existing roads will be upgraded and lengthened by 5,548km

APPROACH TO THIS BASIC ASSESSMENT REPORT

The BA for the proposed project is presently in the planning phase. This phase serves primarily to inform the public and relevant authorities about the proposed project and to determine any impacts. These impacts will then be extensively addressed during the environmental impact assessment studies. Only after the full Basic Assessment Report has been submitted will the relevant authorities make a decision.

A Draft Basic Assessment Report (dBAR) will be compiled which will comprehensively describe the activities and impacts that the project may have on the receiving environment, including specialist reports and details from the PPP process. The dBAR and Environmental Management Programme (EMPr) will be submitted for a 30 day public comment period.

Subsequent to the review and commenting period, a Final BAR will be compiled for submission to the Department of Environmental Affairs and Development Planning (DEA&DP). This will include all public comments and response to issues raised by I&APs.

Should the authorities grant approval via an environmental authorisation, all registered I&APs will be notified accordingly and given the opportunity to appeal against the decision, should they so wish.

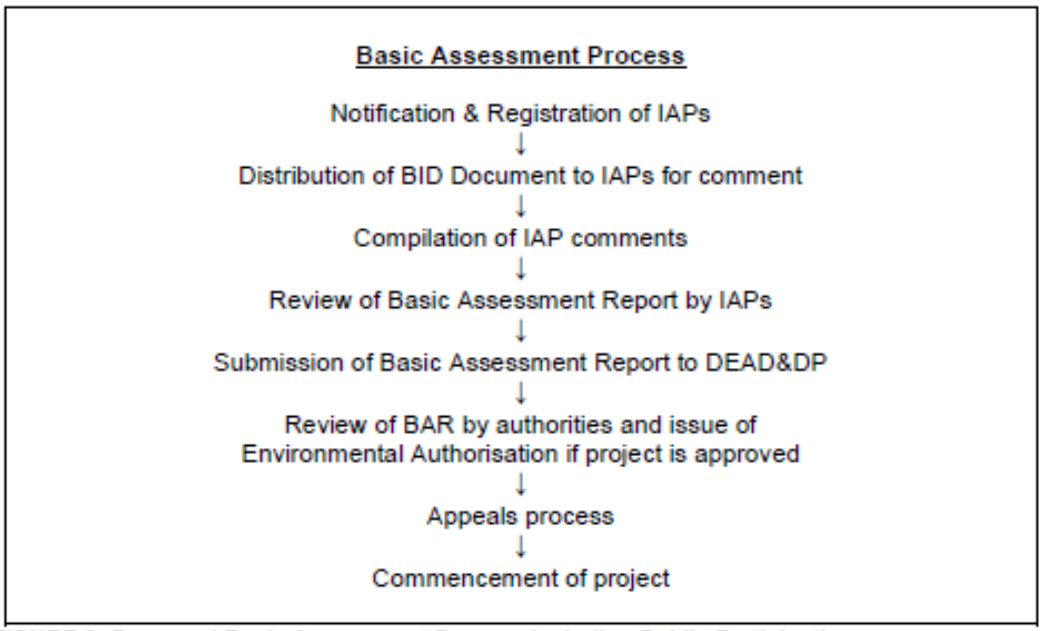


FIGURE 3: Proposed Basic Assessment Process Including Public Participation.

POTENTIAL IMPACTS AND BENEFITS

The following specialist studies will be conducted to ascertain any potential impacts, positive and negative, that may occur as a result of the potential authorization of the project, and to propose mitigation measures for the construction and operation phases:

- Ecological impact assessment
- Heritage impact assessment

HOW CAN YOU BE INVOLVED?

A Public Participation Process (PPP) is being conducted as part of the BAR. The aim of the PPP is to allow everyone who is interested in, or likely to be affected by, the proposed development to provide input into the process.

The Public Participation Process will include:

- Advertisements in the local newspapers;
- Notice Boards on site;
- Circulation of the BID (this document) to all I&APs and stakeholders;
- Registration of all I&APs and stakeholders;
- Review of all comments by registered I&APs and stakeholders.

If you consider yourself an interested and/or affected person/party, **it is important that you become and remain involved in the public participation process**. In order to do so please follow the steps below in order to ensure that you are continually informed of the project developments and will ensure your opportunity to raise issues and concerns pertaining to the project.

STEP 1: Please register by responding to our notification and invitation, with your name and contact details (details provided on cover page and below). As a registered I&AP you will be informed of all meetings, report reviews and project developments throughout the EIA process.

STEP 2: Please send us any comments, concerns or queries you may have in relation to the proposed road upgrade activities.

STEP 3: Attend meetings that will be held throughout the BAR process. As a registered I&AP, you will be invited to these meetings.

CES is required to engage with all private and public parties that may be interested and/or affected by the proposed road upgrade BAR, in order to distribute information for review and comment in a transparent manner.

In the same light, it is important for I&APs to note the following:

1. In order for CES to continue engaging with you, please **ENSURE** that you register on our database by contacting the person below.
2. As the BAR process is regulated by specific review and comment timeframes, it is your responsibility to submit your comments within these timeframes.

If you would like to be kept up to date with the Basic Assessment process for this project please send your contact details to:

Skye Clarke-Mcleod

Tel: 021 045 0900

cesct@cesnet.co.za

BASIESE ONTLEDING VIR DIE KONSTRUKSIE VAN RADIO ANTENNAS VIR DIE SUID AFRIKAANSE NASIONALE RUIMTE AGENSTSKAP

AGTERGROND INLIGTING DOKUMENT
&
UITNODIGING VIR KOMMENTAAR

TERUGVOER ADRES VIR KOMMENTAAR:
CES
Skye Clarke-Mcleod
Elta House, 3rd floor, 3
Caledonian Rd,
Mowbray, Cape Town,
7700
Tel: 021 045 0900
E-pos: cesct@cesnet.co.za

CES
ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

DOEL VAN DIE DOKUMENT

Die doel van die dokument is om te verseker dat **mense wat belangstellend** of **affekteer** is deur die **voorgestelde projek, voorsien word van informasie aangaande die voorstel**, die **proses wat gevolg word** en die **geleentheid gegee word om betrokke te raak** in die omgewings ontledings proses.

Registrasie as 'n **Belanghebbende en/of Geaffekteerde Party** (B&GP) laat individue of groepe toe om **bydrae te lewer met idees, aangeleenthede en bekommernisse aangaande die projek.** B&GPe het ook die gleentheid om al die verslae te **hersien en om kommentaar** in te dien. Alle kommentaar ontvang word ingesluit in die verslae wat ingedien word by die Bevoegde Owerheid.

DIE VOORSTELLER

Die Suid Afrikaanse Nasionale Ruimte Agentskap (SANRA) het 'n hoof kantoor in Pretoria, wat toesig hou oor bedrywighede en bestuur van die Aarde Observasie Program en Ruimte Bedrywighede Programme (tans baseer in Hartebeeshoek in die Gauteng Provinsie). SANRA het CES aangestel as die Omgewings Ontledings Praktisyn om aansoek te doen vir die Omgewings Goedkeuring. SANRA se navorsing focus op ruimte, ingenieurswese en tegnologie wat ontwikkeling kan bevorder, menslike kapitaal kan bou en belangrike nasionale dienste te voorsien.

DIE OMGEWINGS ONTLEDINGS PRAKTISYN

CES spesialiseer in omgewings en sosiale impak ontledings sowel as omgewings bestuur en is aangestel deur SANRA om die vereiste Basiese Ontleding (Assessering) uit te voer vir die voorgestelde projek. CES is gestig in 1990 toe hulle betrokke was as toonaangewende konsultante vir 'n groot minerale myn se Omgewings Impak Ontelding (OIO) in Suid Afrika, en sedert die voltooing van daardie eerste OIO, het hulle omvang van werk uitgebrei om 'n wye verskeidenheid van omgewings en sosiale adviesdienste aan die publiek en privaat sektor kliënte beide in Suid Afrika en internasionaal te voorsien.

PROJEK BESKRYWING

SANRA - Suid Afrikaanse Nationale Ruimte Agentskap stel die konstruksie van radio antennas en assosieerde infrastructure voor op porsie 8 van plaas 148, naby Matjiesfontein in die-Wes Kaap in die vervulling van hulle visie om nasionale ruimte wetenskap en tegnologie programme te koörineer en integreer, en lang termyn beplanning en implementering van ruimte verwante aktiwiteite in Suid Afrika uit te voer.

In 2019, was 'n ander area binne die eiendom porsie assesseer, wat 1km vanaf Matjiesfontein geleë is. Die resultate van die Kulturele Landskap Impak Ontleding wat onderneem is het aangedui dat daar 'n hoë visuele inbraak is op die Nasionale Erfenis Terrein van die Matjiesfontein dorpie.

As gevolg van hierdie resultate was die area ongeskik geag vir ontwikkeling en die voorstander het toe die ligging verander om 'n area te soek with verlaagte impakte. Die nuwe voorgestelde terrein, is ongeveer 3.3km vanaf Matjiesfontein.

Die projek sal bestaan uit vier Diep Ruimte Navigeer antennas van so hoog as 45m, elk met 'n fiesiese voetspoor van 360m², een Ku-antenna toot 'n hoogte van 30m met 'n ooreenstemmende voetspoor van 400m² en drie Kleiner SANRA antennas tot en met 12m in hoogte, elk met 'n voetspoor van 100m².

Ander infrastructure sluit in 4m wye, grond toegangspaaie, 'n wag huis, 'n bedryfs gebou van 525m², twee grond parkeer areas van 900m², ablusie geriewe, water stoor fasiliteite vir brand bestuur en bewaring, vir tydelike riool en grys water berging.

Die voorstander het ook 'n elektriese kragstasie op die terrein nodig, met 'n oorhoofse transmissielyn wat Koppel aan die Eskom sub-stasie wat 750m vêr is. Die kragtasie sal kragopwekkers huisves, en diesel stoor in self gebonde houers en sal ook 'n werkswinkel en stoor area bevat, wat van soortgelyke grootte sal wees as die hoof bedryfs gebou.

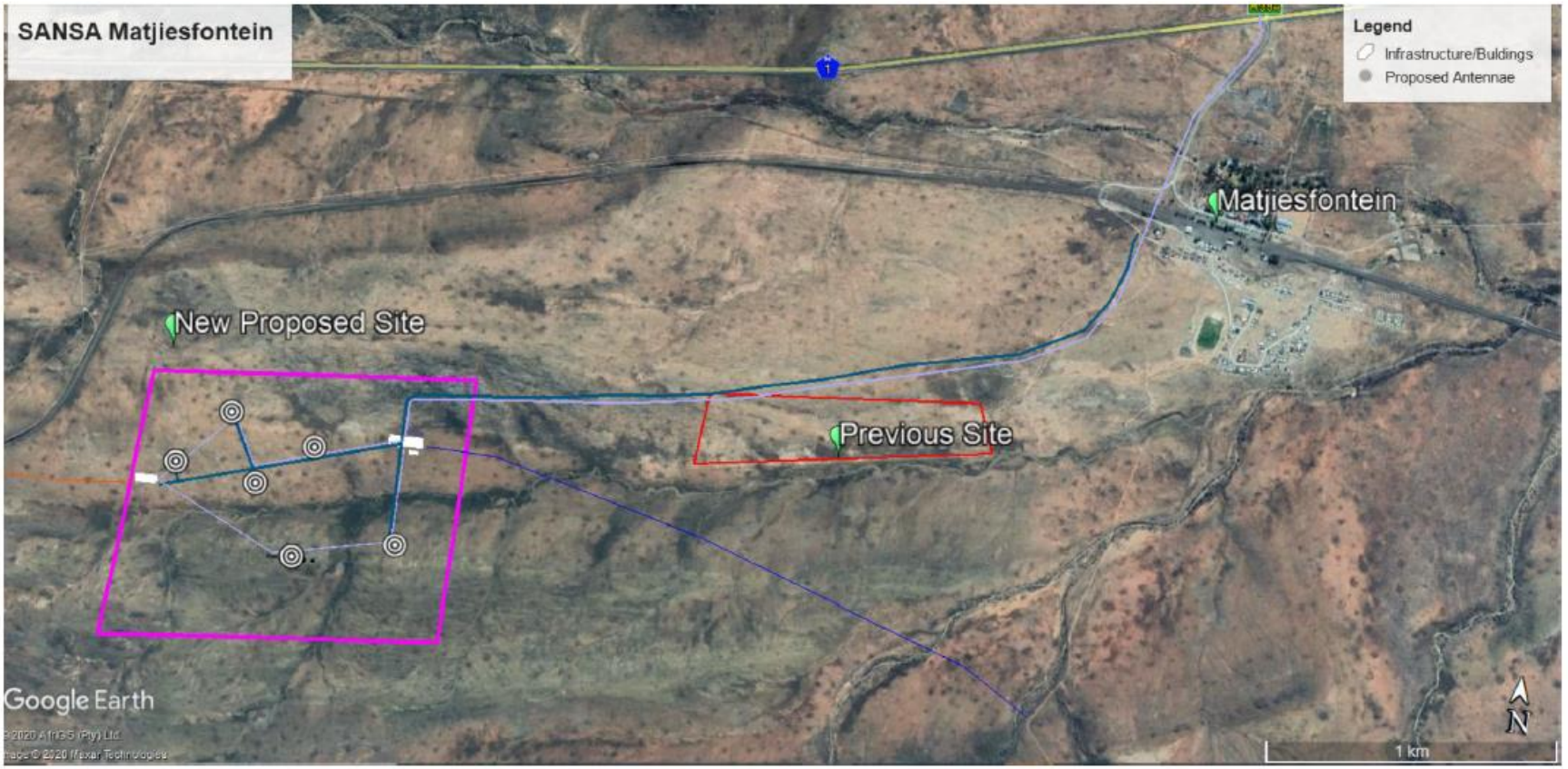
Water sal vanaf die munisipale punt verkry word en aangevul word met die boor van 'n boorgat op die terrein.

Vesellyne sal onder die grond loop in 'PVC' buise wat na die terrain lei om antennas te bedien met PVC-mangate met tussenposes van 50 meter. Die perseelgrens sal omhein word volgens nasionale sleutelpuntstandaarde.

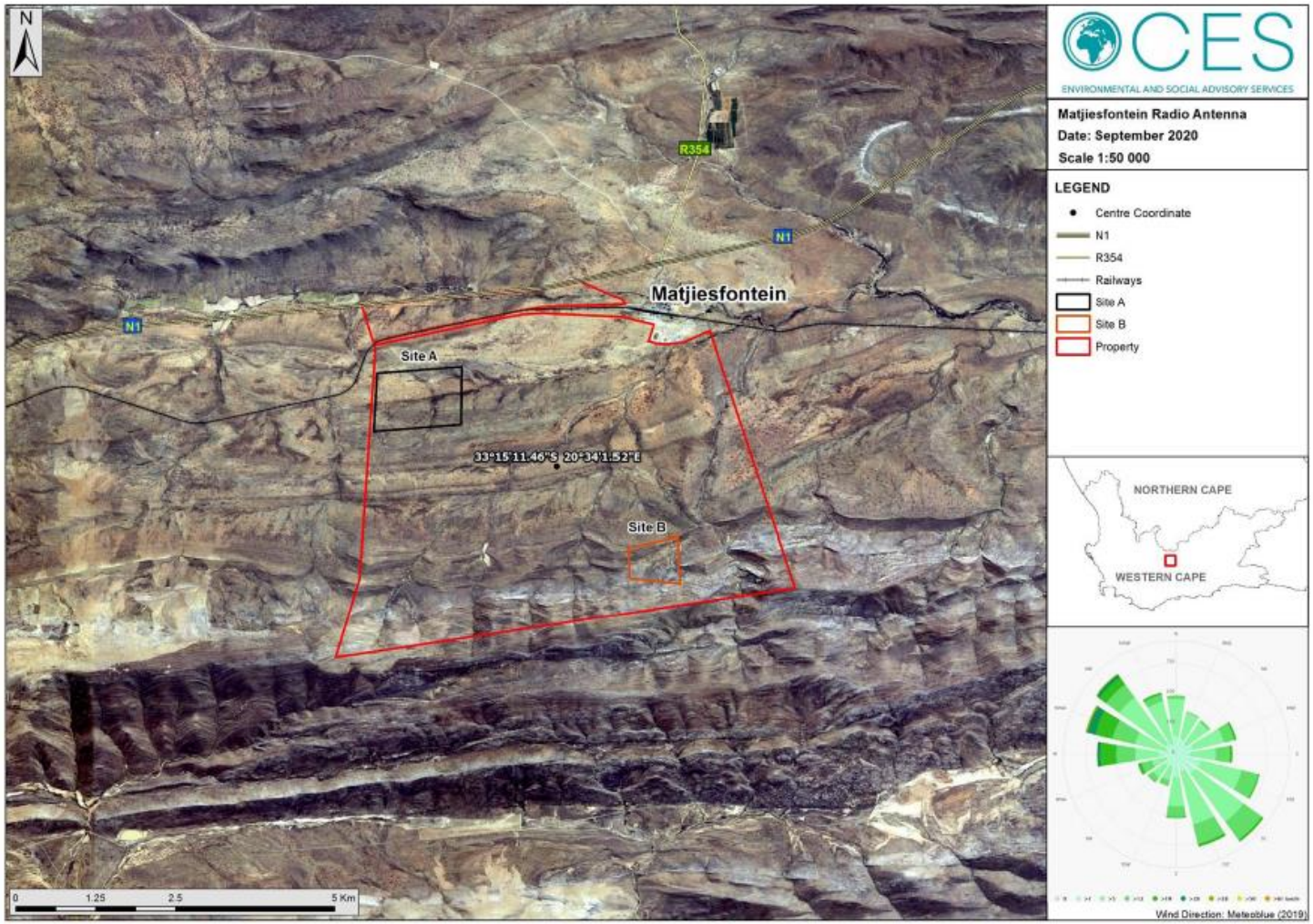
Terrein B bevat twee wetenskaplike instrumente, bekend as kort / lang laser-rangers (K / LLR), elk met 'n voetspoor van 14,2 m² (die grootte van 'n skeepsvraghouer) en 'n administrasiekas met 'n voetspoor van 9 m² (3mX3m).

Sonpanele sal deel vorm van die dak van die infrastruktuur om krag aan die toerusting te voorsien. Die wetenskaplike instrumente sal elkeen afsonderlik omhein word deur 'n standaard 3 m hoë, 10 m x 10 diamantmaasheining met plat "rap" aan die bokant.

Die bestaande toegangspaaie na hierdie terrein sal onveranderd bly, maar nuwe interne grondpaaie, 4m breed, sal nodig wees om toegang tot die infrastruktuur te kry



Figuur 1: Plaaslikheidskaart van die voorheen beoordeelde terrein en die nuwe voorgestelde terrein, nou bekend as terrein A



Figuur 2: Terrein A en Terrein B, Matjiesfontein voorgestelde terreine

RELEVANTE WETGEWING

Die Omgewings Impak Ontleding (OIO) regulasies en regerings lyste spesifiseer watter ontwikkeling aktiwiteite of 'n Basiese Ontleding (Lys Kennisgewing 1 en 3) vereis, of 'n volledige Omvang Bepaling en Omgewings Impak Ontleding (Lys Kennisgewing 2). Gewoonlik, word Basiese Ontledings vereis vir laer impak projekte, waar volle Omvang Bepaling en Omgewings Impak Ontledings (OIO) reserveer word vir hoë impak projekte.

Die voorgestelde projek is onderhewig aan 'n Basiese Ontleding in terme van die volgende aktiwiteit:

Aktiwiteit nommer	Aktiwiteit	Projek komponent aktiverings aktiwiteit
	Gelyste Kennisgewing 1 (GNR 327)	
12	Die ontwikkeling van – (ii) infrastruktuur of strukture wat 'n fiesiese voetspoor van 100 vierkante meter of meer; (a) binne 'n waterloop; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;	Die kombineerde fisiese voetspoor van die ontwikkeling is ongeveer 33 738m² en sommige infrastruktuur soos die omheining, sal aangetref word 32m van 'n waterloop
14	Die ontwikkeling en verwante bedryf van fasiliteite of infrastruktuur, vir die opberging of vir die opberging en hantering van gevaarlike goedere, waar sodanige opberging plaasvind in houers met 'n gesamentlike kapasiteit van 80 kubieke meter of meer, maar nie meer as 500 kubieke meter nie	Die voorstander is van plan om vier houers diesel, wat elk met 'n inhoud van 70 000 liter bevat, te berg. Met 'n totaal van 280 kubieke meter
27	Die opruiming van 'n oppervlakte van 1 hektaar of meer, maar minder as 20 hektaar inheemse plantegroei,	Met insluiting van nuwe paaie word daar verwag dat 3.37 ha skoon gemaak gaan word
	Gelyste Kennisgewing 3 (GNR 324)	
3	Die ontwikkeling van maste of torings van enige materiaal of soort wat gebruik word vir die uitsending van telekommunikasie of radio-uitsendingsdoeleindes waar die mas of toring- (a) Geplaas word op die aanleg nie voorheen gebruik vir die doel, en (b) Sal 15 meter in hoogte oorskrei (i) Wes Kaap (i) Alle areas buite stedelike gebiede	Die radioantennas sal tot 45 m hoog wees en op 'n groenveldperseel geleë wees.

4	Die ontwikkeling van 'n pad breër as 4 meter met 'n reserwe van minder as 13,5 meter (i) Wes-Kaap (ii) Gebiede buite stedelike gebiede; (aa) Gebiede wat inheemse plantegroei bevat	Nuwe grondpaaie moet ontwikkel word en bestaande paaie moet opgegradeer word, dit sal 4 m breed wees. Verdig en bedek met 'n laag gruis
10	Die ontwikkeling en verwante bedryf van fasiliteite of infrastruktuur vir die opberging of opberging en hantering van gevaarlike goedere, indien sodanige berging plaasvind in houers met 'n gesamentlike inhoud van 30, maar nie meer as 80 kubieke meter nie. i. Wes-Kaap ii. Alle gebiede buite stedelike gebiede;	Die voorgestelde ontwikkeling is buite stedelike areas
18 (i)	Die verbreding van 'n pad met meer as 4 meter, of die verlenging van 'n pad met meer as 1 kilometer. (i) Alle gebiede buite stedelike gebiede (aa) Gebiede wat inheemse plantegroei bevat;	Bestaande paaie sal opgradeer en verleng word met 5,548km

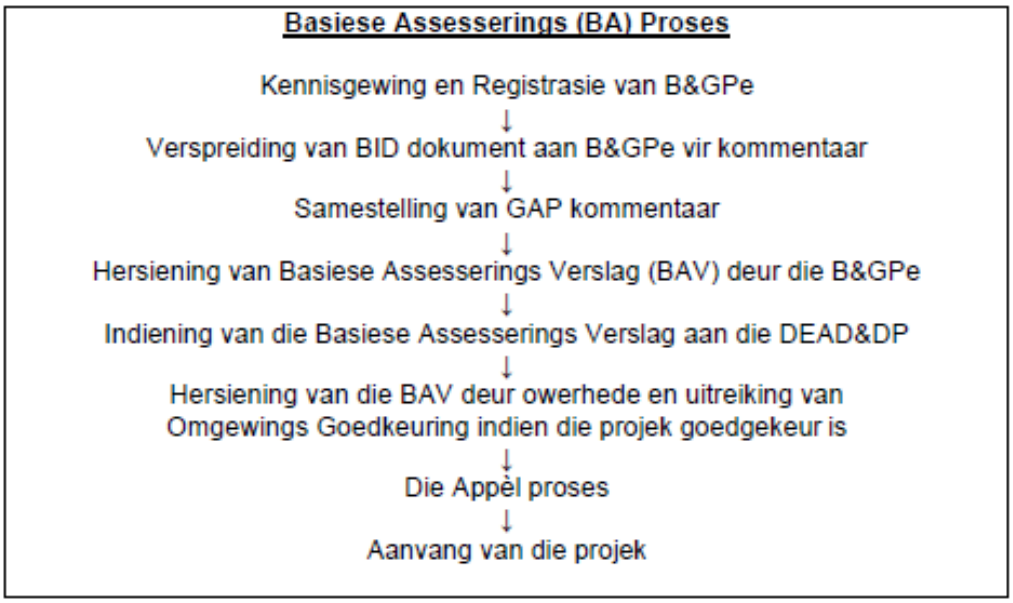
BENADERING TOT DIE BASIESE ASSESSERINGS - ONTLEDINGS VERSLAG

Die BA (Basiese Assesserings verslag) vir die voorgestelde projek is tans in die beplannigs fase. Hierdie fase dien hoofsaaklik as informasie vir die publiek en relevante owerhede aangaande die voorgestelde projek en om moontlike impakte te bepaal. Hierdie impakte sal dan breedvoerig aangespreek word gedurende die omgewings impak ontledings studies. Slegs na die volledige Basiese Ontledings Verslag in gedien is, sal die relevante owerhede 'n besluit neem.

'n Konsep Basiese Assesserings Verslag (kBAV) sal saamgetel word wat breedvoerig sal beskryf wat die aktiwiteite en impakte sal wees wat die projek mag behels, op die ontvangende omgewing, ingesluit spesialis verslae en besonderhede van die PDP proses. Die Kbav en die OBPv (Omgewings Bestuur Program Verslag) sal uitgereik/publiseer word vir 'n 30 dae publieke kommentaar lewerings periode.

Daaropvolgend na die hersiening en kommentaar lewerings periode, sal 'n Finale BOV saamgestel word vir indiening by die Departement van Omgewing Sake en Ontwikkeling Beplanning (DOS&OB). Dit sal al die publieke kommentaar en reaksies tot aangeleenthede uitgelig deur B&GPe; insluit.

Indien die owerhede goedkeuring gee deur middle van die omgewings goedkeuring, sal al die B&GPe sodoende ingelig word en die geleentheid gegee word om appèl te maak teen die besluit, indien hulle dit wil doen.



FIGUUR 3: Die voorgestelde Basiese Assesserings Proses insluitend die Publieke Deelname .

POTENSIËLE IMPAKTE EN VOORDELE

Die volgende spesialis studies sal uitgevoer word om te bepaal of daar enige potensiële impakte is, positief en negatief, wat moontlik mag plaasvind as 'n gevolg van die potensiële goedkeuring van die projek; en om voorgestelde versagtende maatreëls vir die konstruksie in bedryfs fases in te stel:

- Ekologiese impak assessering
- Erfenis impak assessering

HOE KAN U BETROKKE WEES?

'n Publieke Deelname Proses (PDP) word uitgevoer as deel van die BAV. Die doel van die PDP is om almal wat belangstel of behoort affekteer te word deur die voorgestelde ontwikkeling, toe te laat om bydrae en insette te lewer tot die proses.

Die Publieke Deelname Proses sal die volgende insluit:

- Advertensies in die plaaslike koerante;
- Kennisgewing borde by die aanleg/area;
- Verspreiding van die BID (hierdie dokument) na alle B&GPe en belanghebbendes;
- Registrasie van alle B&GPe en belanghebbendes;
- Hersiening van alle kommentaar deur geregistreerde B&GPe en belanghebbendes.

Indien u, jouself as 'n belanghebbende en/of geaffekteerde persoon/party, beskou, **is dit belangrik dat u betrokke raak en bly in die publieke deelname proses.**

Om sodoende betrokke te raak, volg asseblief die stappe hier onder om seker te maak dat u voortdurend ingelig word van projek ontwikkelings en sal u geleentheid verseker om aangeleenthede uit te lig en bekommernisse tot die projek bekend te maak.

STAP 1: Registreer asseblief deur te reageer op die kennisgewing en uitnodiging, met u naam en kontak besonderhede (soos uitgelig op die dekblad en hier onder). As 'n registreerde I&AP sal u ingelig word van alle vergaderings, verslag hersienings en projek ontwikkelings deurgans tot die OIO proses.

STAP 2: Stuur asseblief vir ons enige kommentaar, besorgdhede of navrae wat u mag hê in verband met die voorgestelde pad opgraderings aktiviteite.

STAP 3: Woon vergaderings by deurgans tot die BOV (Basiese Ontledings Verslag) proses.

CES word vereis om in verbeinding te wees met alle private en publieke partye wat belanghebbend of geaffekteer mag word deur die voorgestelde pad opgraderings BOV, om ons sodoende instaat te stel om informasie vir hersiening en kommentaar te versprei op 'n deursigtige wyse.

In dieselfde lig, is dit belangrik vir B&GP to note the following:

1. Om CES in staat te stel om op 'n volgehoue basis met u in aanraking te bly, **VERSEKER** asseblief dat u op die databasis registreer deur die persoon hier onder te kontak.
2. Soos wat die BOV proses reguleer word deur spesifieke hersiening en kommentaar tydsraamwerke, is dit u verantwoordelikheid om kommentaar in te dien binne die tydsraamwerke.

Indien u ingelig wil bly met die Basiese Ontledings proses vir die projek, stuur asseblief u kontak besonderhede na:

Skye Clarke-Mcleod

Tel: 021 045 0900

E-pos: cesct@cesnet.co.za

APPENDIX F6: PROOF OF POSTAL SERVICES USED TO NOTIFY I&AP'S

Sent: 18 November 2019

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(With an insurance option/met 'n versekeringsopsie)

Post Office

Full tracking and tracing/Volledige volg en spoor

Name and address of sender
Naam en adres van afsender: Coastal and Environmental Services (PTY) Ltd ; Block C, The Estuaries, Oxbow Crescent, Century City, 7441

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntekopie
1	J. Putter Bijstelr Nature Res. Tourism					REGISTERED LETTER RC387573113ZA CUSTOMER COPY
2	Kent Flowers PO Box 482 MONTAGU					REGISTERED LETTER RC387574306ZA CUSTOMER COPY
3	Hendrik Louw Plot 30 Matjiesfontein 6019					REGISTERED LETTER RC387574290ZA CUSTOMER COPY
4	Martha Horne Plot 33 Matjiesfontein 6019					REGISTERED LETTER RC387574286ZA
5	Sheryldene Pearce Plot 34 Matjiesfontein 6019					REGISTERED LETTER RC387574272ZA
6	Hannelie Willemse Plot 35 Matjiesfontein 6019					REGISTERED LETTER RC387573983ZA
7	Anna Johanna Solomon Plot 36 Matjiesfontein 6019					REGISTERED LETTER RC387573952ZA
8	Iris Van Schalkwyk Plot 39 Matjiesfontein 6019					REGISTERED LETTER RC387573087ZA
9	Mitchel Cupido Plot 40 Matjiesfontein 6019					REGISTERED LETTER RC387573864ZA CUSTOMER COPY
10	Kaitlyn Theniseen Plot 29 Matjiesfontein 6019					REGISTERED LETTER RC387573833ZA CUSTOMER COPY
	Total / Totaal	R	R	R	R	

Number of letters posted / Getal briewe gepos: 10

Signature of client / Handtekening van kliënt: .....

Signature of accepting officer / Handtekening van aanneembeampte: .....

Date stamp: Century City 7446 Post Office 18 NOV 2019 Folio No. / Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

A.P.G.T. 701248

List of REGISTERED LETTERS
Lys van GEREGISTREERDE BRIEWE
(With an insurance option/met 'n versekeringsopsie)

Post Office

Full tracking and tracing/Volledige volg en spoor

Name and address of sender
Naam en adres van afsender Coastal and Environmental Services (PTY) Ltd ; Block C, The Estuaries, Oxbow Crescent, Century City

Enquiries/Navrae
Toll-free number
Tolvry nommer
0800 111 502

No	Name and address of addressee / Naam en adres van geadresseerde	Insured amount / Versekerde bedrag	Insurance fee / Versekeringsgeld	Postage / Posgeld	Service fee / Diensgeld	Affix Track and Trace customer copy / Plak Volg-en-Spoor-kliëntafskrif
1	Abe Appalis Plot 28 Matjiesfontein					REGISTERED LETTER RC387573895ZA CUSTOMER COPY
2	Poleen Dewee Plot 41 Matjiesfontein 6919					REGISTERED LETTER RC387573921ZA CUSTOMER COPY
3						
4						
5						
6						
7						
8						
9						
10						
	Total / Totaal	R	R	R	R	

Number of letters posted
Getal briewe gepos 2

Signature of client
Handtekening van kliënt

Signature of accepting officer
Handtekening van aanneembeampte

Date stamp
Century City 7446 Post Office
18 NOV 2019
Folio No: 2
Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

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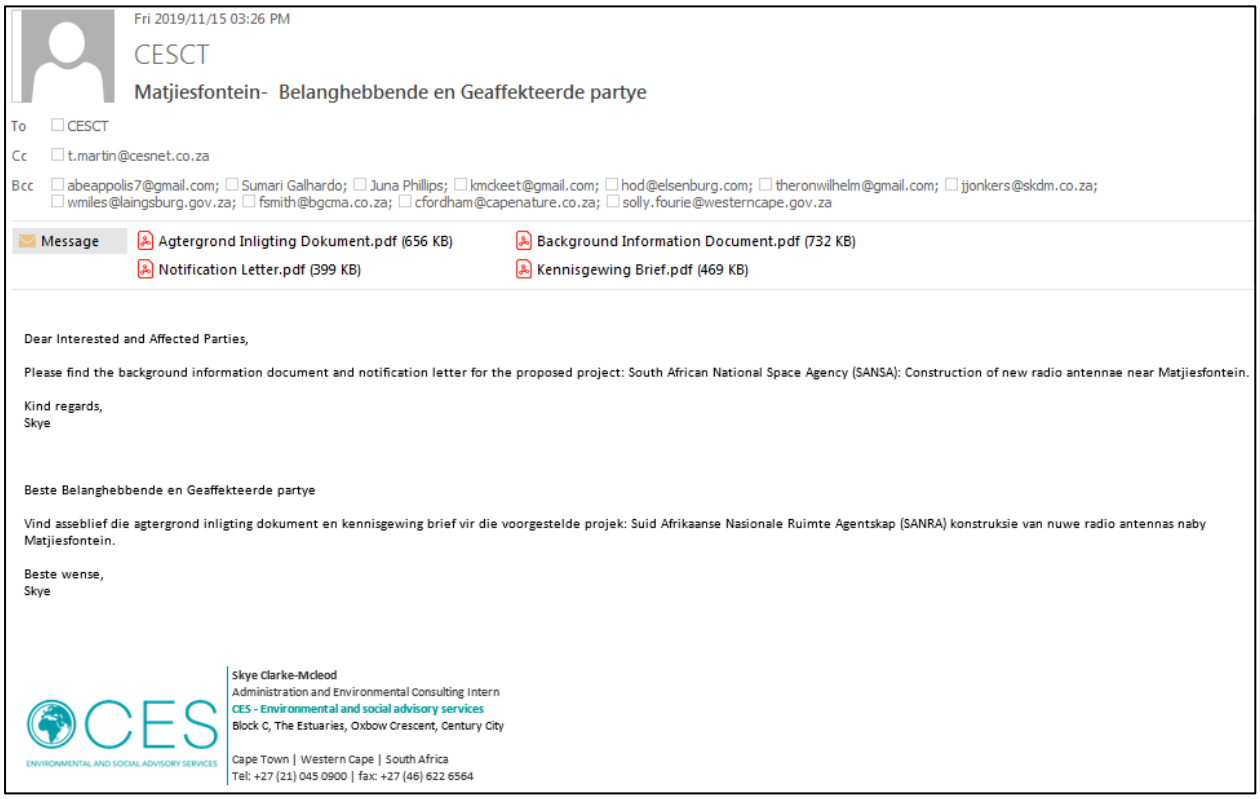
A.P.,C.T. 701248

APPENDIX F7:INCEPTION EMAIL SENT TO OTHER IAPS

Sent: 15 November 2019



Fri 2019/11/15 03:26 PM

CESCT

Matjiesfontein- Belanghebbende en Geaffekteerde partye

To CESCT

Cc t.martin@cesnet.co.za

Bcc abeappolis7@gmail.com; Sumari Galhardo; Juna Phillips; kmckeet@gmail.com; hod@elsenburg.com; theronwilhelm@gmail.com; jjonkers@skdm.co.za; wmiles@laingsburg.gov.za; fsmith@bgcma.co.za; cfordham@capenature.co.za; solly.fourie@westerncape.gov.za

Message | Agtergrond Inligting Dokument.pdf (656 KB) | Background Information Document.pdf (732 KB) | Notification Letter.pdf (399 KB) | Kennisgewing Brief.pdf (469 KB)

Dear Interested and Affected Parties,

Please find the background information document and notification letter for the proposed project: South African National Space Agency (SANSA): Construction of new radio antennae near Matjiesfontein.

Kind regards,
Skye

Beste Belanghebbende en Geaffekteerde partye

Vind asseblief die agtergrond inligting dokument en kennisgewing brief vir die voorgestelde projek: Suid Afrikaanse Nasionale Ruimte Agentskap (SANRA) konstruksie van nuwe radio antennas naby Matjiesfontein.

Beste wense,
Skye

CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

Skye Clarke-Mcleod
Administration and Environmental Consulting Intern
CES - Environmental and social advisory services
Block C, The Estuaries, Oxbow Crescent, Century City

Cape Town | Western Cape | South Africa
Tel: +27 (21) 045 0900 | fax: +27 (46) 622 6564

Updated BID sent 17 October 2020

Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye

Reply | Reply All | Forward | ...

Sat 2020/10/17 14:29

CESCT

To CESCT

Cc Tarryn Martin

Bcc john.geeringh@eskom.co.za; Andrew Salomon; waseefa.dhansay@westerncape.gov.za; hlatshwayobs@caa.co.za; smunzhedzi@environment.gov.za; smalete@environment.gov.za; Zama Langa; solly.fourie@westerncape.gov.za; Colin Fordham; Adri La Meyer; Andiswa Sam; Rudzani Makahane; abri@skdm.co.za; info@laingsburg.gov.za; wmiles@laingsburg.gov.za; jjonkers@skdm.co.za; theronwilhelm@gmail.com; danie.swanepoel@westerncape.gov.za; hod@elsenburg.com; abeappollis7@gmail.com; Unathi.Mapoma@transnet.net; tweedside@vodamail.co.za; vivcrone@gmail.com; Sumari Galhardo; Juna Phillips; info@rietfonteinreserve.co.za;

You responded on Wednesday, 21 October 2020 08:33.

Agtergrond Inligting Dokument.pdf 1001 KB | Background Information Document.pdf 952 KB

Dear Interested and Affected Parties,

Please find the updated background information document for the proposed project: South African National Space Agency (SANSA): Construction of new radio antennae near Matjiesfontein.

Kind regards,
Skye

30 YEARS OF CES ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

Skye Clarke-Mcleod
Environmental Consultant and Administrator
CES - Environmental and social advisory services
Block C, The Estuaries, Oxbow Crescent, Century City, 7441
Cape Town | Western Cape | South Africa
Tel: +27 (21) 045 0900 | fax: +27 (46) 622 6564
cesct@cesnet.co.za | www.cesnet.co.za

EMAIL DELIVERY RECEIPTS

Relayed: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye

Microsoft Outlook

Sent Sat 2020/10/17 14:29

To CESCT

Delivery to these recipients or groups is complete, but no delivery notification was sent by the destination server:

john.geeringh@eskom.co.za (john.geeringh@eskom.co.za)

Andrew Salomon (asalomon@sahra.org.za)

waseefa.dhansay@westerncape.gov.za (waseefa.dhansay@westerncape.gov.za)

hlatshwayobs@caa.co.za (hlatshwayobs@caa.co.za)

smunzhedzi@environment.gov.za (smunzhedzi@environment.gov.za)

smalete@environment.gov.za (smalete@environment.gov.za)

Zama Langa (ZLanga@environment.gov.za)

solly.fourie@westerncape.gov.za (solly.fourie@westerncape.gov.za)

Colin Fordham (landuseadvicesouth@capenature.co.za)

Adri La Meyer (Adri.LaMeyer@westerncape.gov.za)

Andiswa Sam (ASam@bgcma.co.za)

Rudzani Makahane (RMakahane@bgcma.co.za)

abri@skdm.co.za (abri@skdm.co.za)

info@laingsburg.gov.za (info@laingsburg.gov.za)

wmiles@laingsburg.gov.za (wmiles@laingsburg.gov.za)

jjonkers@skdm.co.za (jjonkers@skdm.co.za)

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danie.swanepoel@westerncape.gov.za (danie.swanepoel@westerncape.gov.za)

hod@elsenburg.com (hod@elsenburg.com)

abeappollis7@gmail.com (abeappollis7@gmail.com)

Unathi.Mapoma@transnet.net (Unathi.Mapoma@transnet.net)

tweedside@vodamail.co.za (tweedside@vodamail.co.za)

vivcrone@gmail.com (vivcrone@gmail.com)

Sumari Galhardo (sumarigalhardo@gmail.com)

Juna Phillips (junap@walkers.law)

info@rietfonteinreserve.co.za (info@rietfonteinreserve.co.za)

cobust@ewt.org.za (cobust@ewt.org.za)

fsmith@bgcma.co.za (fsmith@bgcma.co.za)

Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye

EMAIL READ-RECEIPTS

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Zama Langa <ZLanga@environment.gov.za>
Sent Sat 2020/10/17 17:50
To

Your message

To: Zama Langa
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Saturday, October 17, 2020 2:28:31 PM (UTC+02:00) Harare, Pretoria

was read on Saturday, October 17, 2020 5:49:46 PM (UTC+02:00) Harare, Pretoria.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Solly Fourie <Solly.Fourie@westerncape.gov.za>
Sent Sat 2020/10/17 20:38
To CESCT

Your message

To:
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Saturday, October 17, 2020 6:37:56 PM (UTC+00:00) Monrovia, Reykjavik

was read on Saturday, October 17, 2020 6:37:39 PM (UTC+00:00) Monrovia, Reykjavik.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Rudzani Makahane <rmakahane@bgcma.co.za>
Sent Sun 2020/10/18 20:41
To CESCT

Your message

To:
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Sunday, October 18, 2020 6:41:11 PM (UTC+00:00) Monrovia, Reykjavik

was read on Sunday, October 18, 2020 6:40:48 PM (UTC+00:00) Monrovia, Reykjavik.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Juna Phillips <junap@walkers.law>
Sent Sun 2020/10/18 23:05
To

Your message

To: Juna Phillips
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Saturday, October 17, 2020 2:28:31 PM (UTC+02:00) Harare, Pretoria

was read on Sunday, October 18, 2020 11:05:12 PM (UTC+02:00) Harare, Pretoria.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye

CF Colin Fordham <landuseadvicesouth@capenature.co.za>
To CESCT

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
John Geeringh <GeerinJH@eskom.co.za>
Sent Mon 2020/10/19 07:52
To CESCT

Your message

To:
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Monday, October 19, 2020 6:00:26 AM (UTC+00:00) Monrovia, Reykjavik

was read on Monday, October 19, 2020 5:51:42 AM (UTC+00:00) Monrovia, Reykjavik.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Andiswa Sam <asam@bgcma.co.za>
Sent Mon 2020/10/19 12:00
To CESCT

Your message

To:
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Monday, October 19, 2020 9:59:56 AM (UTC+00:00) Monrovia, Reykjavik

was read on Monday, October 19, 2020 9:59:32 AM (UTC+00:00) Monrovia, Reykjavik.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Adri La Meyer <Adri.LaMeyer@westerncape.gov.za>
Sent Mon 2020/10/19 12:23
To CESCT

Your message

To:
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Monday, October 19, 2020 10:23:19 AM (UTC+00:00) Monrovia, Reykjavik

was read on Monday, October 19, 2020 10:23:05 AM (UTC+00:00) Monrovia, Reykjavik.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Winnie Miles <wmiles@laingsburg.gov.za>
Sent Tue 2020/10/20 11:50
To CESCT

Your message

To:
Subject: Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Tuesday, October 20, 2020 9:50:05 AM (UTC+00:00) Monrovia, Reykjavik

was read on Tuesday, October 20, 2020 9:49:49 AM (UTC+00:00) Monrovia, Reykjavik.

Read: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
HOD <HOD@elsenburg.com>
Sent Wed 2020/10/21 18:05
To

Your message

To: HOD
Subject: Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye
Sent: Saturday, October 17, 2020 2:28:31 PM (UTC+02:00) Harare, Pretoria

was read on Wednesday, October 21, 2020 6:05:11 PM (UTC+02:00) Harare, Pretoria.

REQUESTS TO BE ADDED AS IAPS

Matjiesfontein Interested and Affected Parties/ Belanghebbende en Geaffekteerde partye

Janine Brasington <j.brasington@redrocket.energy>
To CESCT
Cc Magdalena Michalowska

Reply | Reply All | Forward
Tue 2020/10/20 11:37

You replied to this message on 2020/10/20 13:52.
This message was sent with High importance.

Dear Skye,

With reference to the BAR for the proposed construction of radio antennae for the South African National Space Agency, Red Rocket South Africa would like to be registered as an interested and affected party as we are developing the Witberg Wind Farm in nearby area, which has been granted an Environmental Authorization.

Kindly register the following people from Red Rocket as I&APs for this proposed project:

Janine Brasington j.brasington@redrocket.energy / +27 (0)21 418 3940
Magdalena Michalowska m.michalowska@redrocket.energy / +27 (0)21 418 3940

Many thanks and kind regards,
Janine

Janine Brasington
Environmental & Social Developer
M: +27 (0)83 556 2752
T: +27 (0)21 418 3940
E: j.brasington@redrocket.energy
Red Rocket South Africa (Pty) Ltd
14th floor, Pier Place, Heerengracht Street, Cape Town, 8001, SOUTH AFRICA - Map
RED ROCKET
www.redrocket.energy

Interested and Affected Parties: Construction of new radio antennae near Matjiesfontein.

Jan Louw <Jan@g7energies.com>
To CESCT
Cc Veronique Fyfe

Reply | Reply All | Forward
Mon 2020/10/19 12:03

You replied to this message on 2020/10/19 12:06.

Good Morning

Please could you register G7 Energies as an I&AP for the proposed project: South African National Space Agency (SANSA): Construction of new radio antennae near Matjiesfontein.

Please use Veronique Fyfe as the main contact with the email address eia@g7energies.com.

Please could you send me a link to access the latest report.

Thank you in advance,

Warm Regards,

--
Jan Louw| Land Rights Manager
G7 Renewable Energies (Pty) Ltd
5th Floor, 125 Buitengracht Street
Cape Town 8001, South Africa
+27 76 423 8710 (Mobile)
+27 21 300 0610 (Office)
+27 86 514 1735 (Fax)
www.g7energies.com

CONFIDENTIALITY : This e-mail and any attachments are confidential and may be privileged. If you are not a named recipient, please notify the sender immediately and do not disclose the contents to another person, use it for any purpose or store or copy the information in any medium.

In case of strong suspicion of phishing, report the email through the reporting tool on your email toolbar or send it as an attachment to info@g7energies.com

BA for the Construction of Radio Antennae for the SANSA

Andries Du Plessis <andries@wpplanning.co.za>
To CESCT

You replied to this message on 2020/10/26 12:11.

Good day

We have been approached by our client (I&AP) regarding the above-mentioned development / application.
We will be acting on their behalf throughout the EIA process and hereby wish to be registered as an I&AP (details provided below).

We have received the BID and invitation to comment, when does this invitation to comment lapse?
There are no dates and deadlines included in the BID.

We will send our comments, concerns or queries regarding the proposal in due course.
Please let me know when will be the latest we can submit our comments.

Thanks

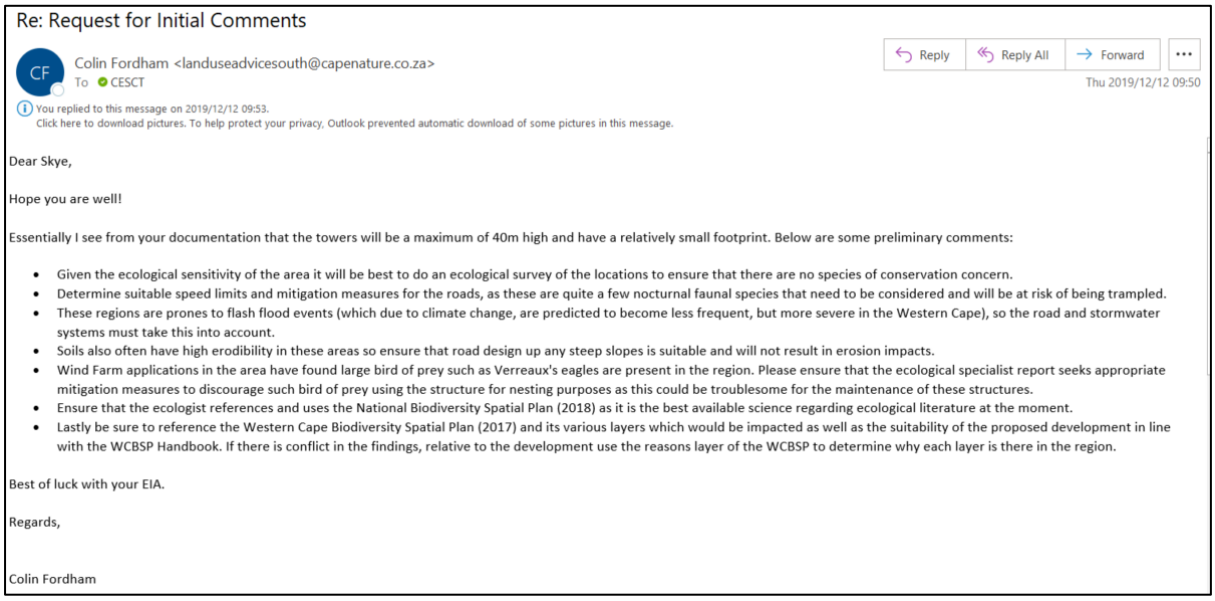
Kind Regards / Vriendelike Groete

Andries du Plessis
Pr. Pln A/2551/2017
Warren **P**etterson **P**lanning
Tel: 021 552 5255
Cell: 076 775 1942
Email: andries@wpplanning.co.za

WPP
TOWN AND REGIONAL PLANNING CONSULTANTS

INITIAL COMMENTS

CapeNature:



Re: Request for Initial Comments

CF Colin Fordham <landuseadvicesouth@capenature.co.za>
To CESCT

Reply | Reply All | Forward | ...
Thu 2019/12/12 09:50

You replied to this message on 2019/12/12 09:53.
Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.

Dear Skye,

Hope you are well!

Essentially I see from your documentation that the towers will be a maximum of 40m high and have a relatively small footprint. Below are some preliminary comments:

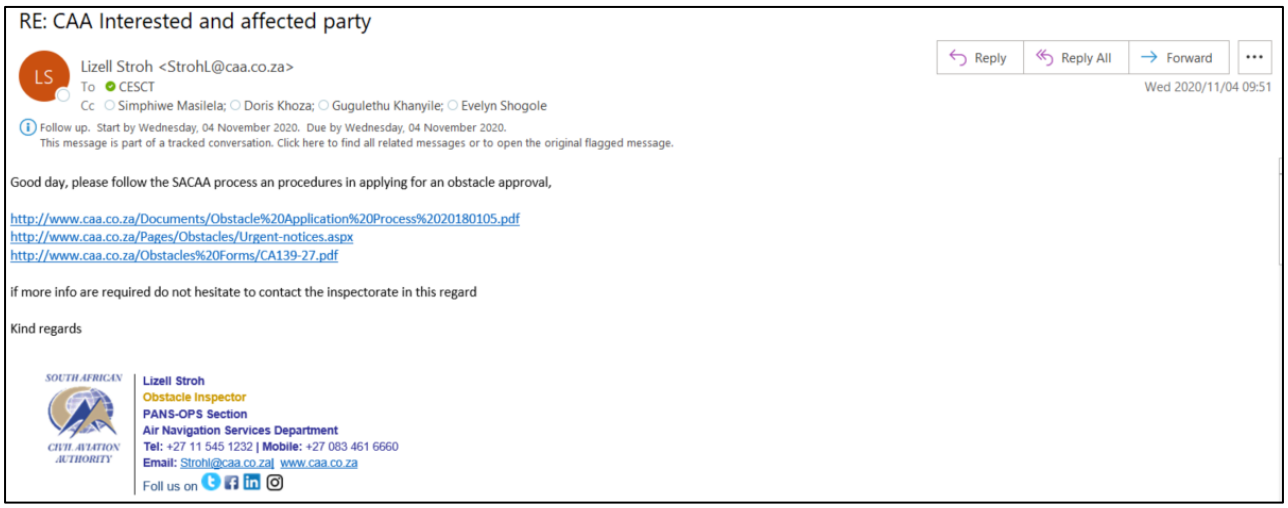
- Given the ecological sensitivity of the area it will be best to do an ecological survey of the locations to ensure that there are no species of conservation concern.
- Determine suitable speed limits and mitigation measures for the roads, as these are quite a few nocturnal faunal species that need to be considered and will be at risk of being trampled.
- These regions are prones to flash flood events (which due to climate change, are predicted to become less frequent, but more severe in the Western Cape), so the road and stormwater systems must take this into account.
- Soils also often have high erodibility in these areas so ensure that road design up any steep slopes is suitable and will not result in erosion impacts.
- Wind Farm applications in the area have found large bird of prey such as Verreaux's eagles are present in the region. Please ensure that the ecological specialist report seeks appropriate mitigation measures to discourage such bird of prey using the structure for nesting purposes as this could be troublesome for the maintenance of these structures.
- Ensure that the ecologist references and uses the National Biodiversity Spatial Plan (2018) as it is the best available science regarding ecological literature at the moment.
- Lastly be sure to reference the Western Cape Biodiversity Spatial Plan (2017) and its various layers which would be impacted as well as the suitability of the proposed development in line with the WCBSP Handbook. If there is conflict in the findings, relative to the development use the reasons layer of the WCBSP to determine why each layer is there in the region.

Best of luck with your EIA.

Regards,

Colin Fordham

Civil Aviation Authority:



RE: CAA Interested and affected party

LS Lizell Stroh <StrohL@caa.co.za>
To CESCT
Cc Simphiwe Masilela; Doris Khoza; Gugulethu Khanyile; Evelyn Shogole

Reply | Reply All | Forward | ...
Wed 2020/11/04 09:51

Follow up. Start by Wednesday, 04 November 2020. Due by Wednesday, 04 November 2020.
This message is part of a tracked conversation. Click here to find all related messages or to open the original flagged message.

Good day, please follow the SACAA process an procedures in applying for an obstacle approval,

http://www.caa.co.za/Documents/Obstacle%20Application%20Process%2020180105.pdf
http://www.caa.co.za/Pages/Obstacles/Urgent-notices.aspx
http://www.caa.co.za/Obstacles%20Forms/CA139-27.pdf

If more info are required do not hesitate to contact the inspectorate in this regard

Kind regards

SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Lizell Stroh
Obstacle Inspector
PANS-OPS Section
Air Navigation Services Department
Tel: +27 11 545 1232 | **Mobile:** +27 083 461 6660
Email: StrohL@caa.co.za| www.caa.co.za
Foll us on

Breede-Gouritz Catchment Management Agency

BREEDE-GOURITZ
CATCHMENT MANAGEMENT AGENCY

101 York Street 3rd Floor Rm 302 George 6530, P.O. Box 1205 George 6530

: Mr. Mthimkhulu
148/8, MATJIESFONTEIN
: 023 346 8000
:mmthimkhulu@bgcma.co.za
:4/10/2/J11E/FARM

CES
Elta House, 3rd floor
3 Caledon Rd, Mowbray
Cape Town
7700

Attention: Skye Clarke-Mcleod

Dear Madam,

COMMENTS ON THE PROPOSED CONSTRUCTION OF NEW RADIO ANTENNAE & ASSOCIATED INFRASTRUCTURE ON PORTION 8 OF FARM 148, NEAR MATJIESFONTEIN IN THE WESTERN CAPE PROVINCE

The above mentioned report, reference: **SANSA Matjiesfontein BID** has reference.

The Breede-Gouritz Catchment Management Agency (BGCMA) has the following comments:

1. No operation is allowed within 100m of a water resource or 1:100 year flood line, whichever is the greatest. If the proposed activity falls within this area, authorisation needs to be put in place in terms of the National Water Act (NWA), 1998 (Act No. 36 of 1998). This is to ensure that the riparian ecological status of the water resource will not be negatively impacted.

2. Please note that any development within 500m from the boundary of any wetland requires authorisation in terms of the National Water Act (NWA), 1998 (Act No. 36 of 1998).

3. No water maybe abstracted from any surface water body and groundwater unless authorized by this Agency. Where will the water for the proposed activity are sourced from?

4. Where solid waste disposal is to take place on site, ensure that only non-toxic materials which have no risk of polluting the groundwater, are buried in designated approved areas at acceptable depths below ground level.

www.bgcma.co.za

5. No surface, ground or storm water may be polluted as a result of any activities on the site. Please use silt retention traps and a Storm water master plan to prevent erosion and pollution.

6. The rehabilitation of the site must ensure that the final conditions of the site is environmentally acceptable and that there will be no adverse long term effects on the surrounding environment especially the water resources.

7. Please note that all requirements as stipulated in the National Water Act (NWA), 1998 (Act No. 36 of 1998) must be adhered to.

8. Please note that this Agency reserves the right to amend and / or add to the comments made above in the light of subsequent information received.

If you have any questions please don't hesitate to contact the official at the above mentioned details.

MR. JAN VAN STADEN

P.P

CHIEF EXECUTIVE OFFICER (ACTING)
DATE: 28/10/2020

APPENDIX G SPECIALIST REPORTS AND TEAM DETAIL

APPENDIX G1: SPECIALIST REPORT(S)

- **Ecological Impact Assessment Report**
- **Heritage Impact Assessment** (including the below specialist studies)
  - Archaeological Impact Assessment
  - Palaeontological Impact Assessment
  - Visual Impact Assessment

Specialist Report Attached separately

APPENDIX G2: FULL CURRICULA VITAE OF THE PROJECT TEAM

CONTACT DETAILS

Legal Name of Company	**Coastal and Environmental Services (Pty) Ltd**
Trading Name of Company	**CES Environmental and Social Advisory Services**
Designation	Cape Town Branch
Profession	Managing Director
Years with firm	Thirty (30) years
E-mail	t.avis@cesnet.co.za
Office number	+27 (0)21 045 0900
Nationality	South African
Professional Affiliations	**SACNASP**: South African Council for Natural Scientific Profession **EAPSA**: Environmental Assessment Practitioner Southern Africa **MRSSAF**: Member of the Royal Society of South Africa **BotSoc**: Botanical Society of South Africa **SAAB**: South African Association of Botanists **SAIE&ES:** South African Institute of Ecologists & Environmental Scientists **IAIA:** International Association of Impact Assessment
Key areas of expertise	Environmental & Social Impact Assessment Environmental & Social Management Plan preparation Terrestrial vegetation and flora specialist studies Coastal dune ecology specialist studies Integrated coastal zone management Strategic Environmental & Social Assessment

PROFILE

Dr Anthony Mark Avis

Ted Avis is a leading expert in the field of Environmental Impact Assessments, having project-managed numerous large-scale ESIAs to international standards, especially those of the International Finance Corporation (IFC). From 1997 to 2005 Ted acted was principle environmental consultant to Corridor Sands Limitada, managing all environment aspects of the US$1,2billion Corridor Sands Project, including five ESIA's, associated ESMPs, and the RAP. He has managed ESIA studies and related environmental assessments of similar scope in Kenya, Madagascar, Egypt, Malawi, Zambia and South Africa. Ted also has experience in large scale Strategic Environmental Assessments in southern Africa, and has been engaged by the IFC on a number of projects.

Between 1994 and 1996 Ted was instrumental in establishing the Environmental Science Department at Rhodes University, whilst a Senior lecturer in Botany at that time. This resulted from his experience running honours modules in EIA practice and environmental management, as well as the applied research he undertook in these disciplines. He was an Honorary Visiting Fellow in the Department of Environmental Sciences at Rhodes between 1998 and 2003. He was one of the first certified Environmental Assessment Practitioner in South Africa, gaining certification in April 2002. He has delivered papers and published in the field of EIA, Strategic Environmental Assessment and Integrated Coastal Zone Management, and has been a principal of CES since its inception in 1990, and Managing Director since 1998.

Ted holds a PhD in Botany, and was awarded a bronze medal by the South African Association of Botanists for the best PhD adjudicated in that year, entitled "Coastal Dune Ecology and Management in the Eastern Cape". Ted is a Certified

Environmental Assessment Practitioner (since 2002) and a professional member of the South African Council for Natural Scientific Professionals (since 1993).

EMPLOYMENT EXPERIENCE

2017 – Present: Divisional Director and head of the Environmental Cluster at NEXTEC (part of the EOH Group). EXCO member of the Industrial Technologies Division of NEXTEC.

- 1998 – Present: Full-time Managing Director of Coastal & Environmental Services.
- 1989 – 1997: Lecturer and Senior Lecturer in Botany at Rhodes University.
- 1990 – 1997: Private environmental consultant and partner of Coastal & Environmental Services (CES, established January 1990).
- 1987 – 1988: Ecological Consultant with Loxton Venn and Associates, responsible for vegetation, soils and land surveys; veld conditions assessments and EIAs.
- 1983 – 1987: Full time post-graduate research in plant ecology, including coastal management studies and Environmental Impact Assessments (EIAs).

ACADEMIC QUALIFICATIONS

- PhD, Rhodes University, 1993
- BSc (Honours), Rhodes University, 1984
- BSc, Rhodes University, 1983

PUBLICATIONS AND TEACHING

- *Presented 29 conference papers at local and international conferences, including plenary presentations.*
- *Published 19 scientific articles in peer reviewed scientific journals.*
- *Published 6 popular articles in local journals.*
- *Published 2 chapters in scientific books.*
- *Supervised 17 post graduate students (honours (10), masters (4), PhD (3)) in plant ecology, coastal ecology and vegetation science.*

COURSES PRESENTED

Presented the following:

- *Tools of Sustainable Coastal Zone Management. Short course (2 x 1-week courses) presented on behalf of NACOMA / World Bank. (Presenter on Coastal zone management and strategic environmental assessment).*
- *Environmental training and teaching for a number of professional short courses, and at undergraduate and postgraduate level at Rhodes University, most notably as a key presenter on the EIA Short Course offered by CES since 2000*
- *Training course on the Integrated Coastal Zone Management Act. Four two day short courses presented to various Government and NGO stakeholders to introduce and explain the NEMA: Integrated Coastal Zone Management Act. Presented on behalf of DEA: Oceans & Coasts. [Study leader and lead presenter).*

CONSULTING EXPERIENCE

SELECTED LARGE ENVIRONMENTAL IMPACT ASSESSMENTS

- Principal consultant for the specialist studies for the Environmental Impact Assessments of proposed dune mining on the Eastern Shores of Lake St Lucia.
- Overall responsibility as EIA project manager for all environmental aspects of Billiton's TiGen mineral sand mining

operations in Mozambique, to produce an EIA that meets international standards.

- EIA project manager for the Corridor Sands mineral sand mining project in southern Mozambique, to produce four EIAs to World Bank standards for the project's bankable feasibility study. EIAs produced for the mine site and smelter, the 400Kv power line, the 87km rail route and a bulk cargo facility at Matola Port. All these EIAs included the preparation of Environmental Management Plans.
- EIA project manager for Tiomin Resources Inc (Toronto, Canada) for their Kwale mineral sands project in southern Kenya. Responsible for producing all six volumes of the EIA, regarded as the most comprehensive in Kenya to date.
- EIA project manager for the EIA to support the rezoning of land to special purposes for the establishment of the Coega Industrial Development Zone (IDZ).
- EIA project manager for the EIA to support the rezoning of land to special purposes for the establishment of the East London IDZ.
- Numerous small-scale Scoping Reports as part of the Environmental Impact Assessment Process and in accordance with the requirements of the Environmental Conservation Act.
- Pre-feasibility Environmental Impact Assessments, including one for BHP's mineral sand mining project in northern Mozambique, and similar projects in south-west Madagascar and Mozambique.
- Study leader for a comprehensive EIA for the World Bank funded 400Kv Mozambique Malawi Interconnector project power line, Malawi sector.
- EIA for a dedicated haul road, material handling facility and jetty near Praia de Xai Xai, Mozambique for WMC Resources, Australia.
- EIA Project Manager for the Nuclear Materials Authority of Egypt, to prepare the EIA as part of the Downer EDI Feasibility Study Team. (2007).
- EIA for a large scale resort development, including two golf courses and three hotels in the Eastern Cape, South Africa. (Ongoing).
- EIA for the Madiba Bay resort development, incorporating the development of various portions of land within a 5000 hectare site for a range of resort type facilities. (2005 – 2008).
- Study Leader for an EIA for a large heavy mineral mining project in South West Madagascar for Exxaro (2006 – 2008).
- Study Leader for an EIA for a proposed heavy mineral mine on the shores of Lake Malawi near Chipoka. (2005 – 2006).
- Study Leader for an ESIA for a proposed large scale integrated tourism resort development in the Eastern Cape (2007 – 2008).

- Environmental and Social consultants to the International Finance Corporation for the Kafue Gorge Lower Hydropower project, Zambia.
- Study Leader for an Environmental, Social and Health Impact Assessment for a proposed large sugar cane to ethanol biofuel project in Sierra Leone for Addax Bioenergy, Geneva (2009 - 2010).
- Study Leader for an ESHIA for a proposed large scale Jatropha biofuels project in Mozambique (2009 - 2010).
- Study leader for Environmental Impact Assessment for a proposed large scale copper and nickel mine in the North West Province of Zambia (2010).
- Lead consultant for an addendum Environmental Impact Assessment for the proposed expansion of a heavy mineral mining project in Nampula Province, Mozambique (2010).
- Quality control reviewer for approximately 8 EIA's for various Windfarm Projects in South Africa (2009 – 2010).
- Study leader for an ESHIA for a proposed large scale palm oil plantation in Sierra Leone (2010).
- Study leader for ESIA for a rare earths mine in Kangankula, Malawi for the Lynas Corporation.
- Study leader for ESIA for a large scale copper mine in the North West Province of Zambia for First Quantum Minerals (2011).
- Study leader for an ESIA for a proposed Cement Plant and for a proposed Limestone quarry in southern Mozambique (2012).
- Study Leader for an Environmental Impact Assessment of the Mooi-Mgeni Transfer Scheme – Phase 2, KwaZulu-Natal Province, South Africa for TCTA (2012).
- Study leader for an ESHIA for a proposed large scale palm oil plantation and estate in Liberia, compliant with international sector specific guidelines. For EP Oil (2012).
- Study leader for an ESHIA for a proposed large scale forestry plantation in Niassa Province, Mozambique for Niassa Green Resources and to be compliant with international sector specific guidelines (2010).
- Study leader for an EIA for a proposed golf course in Makana District, South Africa (2012)
- Study leader for an EIA for a proposed housing and residential estate in Makana District, South Africa (2012).
- Study Leader for an ESHIA for a heavy mineral mining project in South West Madagascar for World Titanium Resources (2013).
- Study Leader for an ESHIA for a heavy mineral mining project on the West Coast of South Africa for Zirco Resources (2013).
- Study Leader for the Tete Iron Ore project ESHIA located in Tete province, Mozambique for Baobab Resources and Capitol Resources Lda (2013 - 2016).

- Study Leader for an ESHIA for the Nicanda Hills Graphite mining project in Cabo Delgado Province, Mozambique for Triton Resources, Perth (2015 - 2016)
- Study Leader for an EIA for the proposed Riemvasmaak Hydropower Station in the Augrabies Falls National Park, undertaken for HydroSA (2015-2016).
- Study Leader for an ESHIA for the Ancuabe Hills Graphite mining project in Cabo Delgado Province, Mozambique for Triton Resources, Perth (2015 – 2016)
- Study Leader for an ESHIA for a tin mine in North Kivu province, DRC for Alphamin Resources (2015 - 2016).
- Study Leader for an EIA for a floating power plant, Port of Ngqura, Eastern Cape Province of South Africa. Prepared as part of the Independent Power Producers Programme on behalf of the Department of Energy's IPP Office and Transnet (2015-2106).
- Study Leader for an EIA to facilitate the import of Liquefied Natural Gas (LNG) at the Port of Ngqura, Eastern Cape Province of South Africa. Prepared as part of the Independent Power Producers Programme on behalf of the Department of Energy's IPP Office and Transnet (2015-2106).
- Study Leader for an ESHIA for the Balama Graphite mining project in Cabo Delgado Province, Mozambique for Battery Minerals Resources, Perth (2017 – 2018)
- Reviewer and co-author for an ESHIA for the Pilivili Mineral Mine, Nampula Province, Mozambique for Kenmare Resources (2018 - 2019)
- Reviewer, co-author and study leader for the Boulders Wind Farm EIA located at near Paternoster, Western Cape, South Africa for Vredenberg Wind Farm (Pty) Ltd. (2019).
- Reviewer for the EIA for the proposed Coastal Protection Scheme, St Francis Bay, Kouga Local Municipality, Eastern Cape Province (2019-2020).
- Study Leader for an ESHIA for a Coal to Urea project in the Highveld Industrial Park on behalf of Wison Engineering (China) and the Industrial Development Corporation (2019 – 2020).

POLICY AND STRATEGIC ASSESSMENTS

- The development of the Eastern Cape Coastal Management Plan, to be adopted as policy by the Eastern Cape Government
- Study leader for the preparation of a State of Environment Report, and Environmental Implementation Plan for the Amatole District Municipality, covering an area of approximately 25 000 km.
- Reports on ecological assessments of the damage caused to the environment by alleged illegal developments along the former Transkei coastline.
- Study leader and project manager for the preparation of a World Bank/Global Environmental Facility funded geographic

Strategic Environmental Assessment of the proposed greater Addo Elephant National Park, Eastern Cape, South Africa.

- A Strategic Environmental Assessment of four land use options in the Centane district of the Wild Coast.
- SEA covering an area half the size of the Eastern Cape (former Transkei) to identify where afforestation projects could be implemented on a sustainable basis for poverty alleviation. Prepared for the Department of Water Affairs and Forestry (2006 – 2007).
- Integrated Coastal Zone Management Plan for the Buffalo City Municipality, Eastern Cape South Africa, including numerous Management Plans for estuaries, beaches etc. (2006 – 2007).
- A Sustainability Analysis of various land use alternatives to determine optimum land use for the future rehabilitation of lease areas at Richards Bay Minerals. (2006).
- State of Environmental Report and Environmental Management System for the Ukhulambe District Municipality. (2005).
- Strategic Environmental Overview for two integrated tourism anchor projects in Mozambique for the International Finance Corporation (2007).
- Study Leader of the Western Cape State of Coast report prepared for the Department of Environmental Affairs & Development Planning (2017-2018).
- Study leader for the revised Coastal Management Programme of the West Coast, on behalf of the West Coast District Municipality (2019).

ECOLOGICAL AND COASTAL

- Ecological impact assessment for a proposed Zinc and Phosphoric Acid plant in the Eastern Cape.
- Ecological specialist reports for the Coega Industrial Development Zone Strategic Environmental Assessment
- Ecological impact assessment of proposed 800km Wild Coast N2 Toll Road, Eastern Cape.
- Study leader for the ecological impact assessment of the Wild Coast Toll Road EIA, Eastern Cape and Kwazulu/Natal, South Africa (2004).
- Study Leader for Baseline Ecological Surveys of coastal lease areas in southern Mozambique for Rio Tinto exploration (2008).
- Pre-feasibility Ecological Survey of the Skeleton Coast to identify critical impacts linked to Diamond and Mineral Mining exploration (2008).
- Coordinator for ecological investigations to establish a sound baseline prior to implementing an EIA, North West Province, Zambia (2011).
- Assessment of the extent and conservation value of forested areas along the Wild Coast within the former Transkei, on behalf of the Eastern Cape Parks Board (2011)

- Study Leader for a biological and archaeological (including heritage) baseline and impact assessment study of the Lesotho Highlands Water Project – Phase II. Prepared for the Lesotho Highlands Development Authority (2013-2014)
- Study Leader for the preparation of the Nhangonzo Critical Habitat Biodiversity Assessment, Inhambane Province, Mozambique. Prepared for Sasol Petroleum Mozambique Limitada and Sasol Petroleum Temane Limitada (2015).
- Bookram Coastal Dune Specialist Study (2017).
- Coastal Dune and Ecological Impact Assessment for the proposed Mosselbankfontein Farm Housing Development near Witsand, Western Cape Province (2019).
- Strategic Environmental Overview: Development Opportunities and Constraints. Cape Agulhas Municipality: Duiker Street to Struisbaai Harbour Precinct Development Plan (2019 -2020).
- Environmental Management and Maintenance Plans for 3 sites (Gouritz; Still Bay & Witsands) in the Hessenque Local Municipality (2020)
- Environmental Risk Assessment and Revegetation Plan for the Witsands Landfill site near Scarborough, for City of Cape Town (2020).

ENVIRONMENTAL MANAGEMENT

- Project manager for a five-year rehabilitation programme of Samancor's Chemfos mine on the West Coast, which later became the West Coast Fossil Park.
- Development of an Open Space Management Plan for the Coega Industrial Development Zone (IDZ), including the demarcation of open spaces, formulation of uses within the open space, integration with MOSS principles and developing guidelines and a business plan for the management of the open space system.
- Preparation of numerous Environmental Management Programme Reports, in terms of the Minerals Act, for quarry operations in the Eastern Cape, including EMPRs for both the Eastern and Western Coega Kops.
- Study Leader for the development of two detailed and definitive Environmental Management Plans for the construction of two large bridges across rivers in the Wild Coast, as part of the Wild Coast N2 Toll Road Project, for South African National Roads Agency Limited. (2006).
- Joint Study Leader for the development of numerous Construction and Operational Phase Environmental and Social Management Plans for Tiomin's proposed Kwale mineral mine in Kenya.
- Completion of numerous (>20) Environmental & Social Management Plans as part of the EIA process and ESIA deliverables.

- Development of a range of Standard Operating Procedures (SOPs) as part of the operational phase ESMP for a large scale agricultural project.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

ANTHONY M. AVIS (TED) Date: 17 January 2020

CONTACT DETAILS

Name of Company	**CES – Environmental and Social Advisory Services**
Designation	Cape Town Branch
Profession	Principal Environmental Consultant, Botanical Specialist and Branch Manager
Years with firm	Eight (8) years
E-mail	t.martin@cesnet.co.za
Office number	+27 (0)21 045 0900
Nationality	**South African**
Professional Body	**SACNASP**: South African Council for Natural Scientific Profession: Professional Natural Scientist (400018/14) **SAAB**: Member of the South African Association of Botanists **IAIASa**: Member of the International Association for Impact Assessments South Africa Member of Golden Key International Honour Society
Key areas of expertise	• Biodiversity Surveys and Impact Assessments • Environmental Impact Assessments • Critical Habitat Assessments • Biodiversity Management and Monitoring Plans

PROFILE

Ms Tarryn Martin

Tarryn holds a BSc (Botany and Zoology), a BSc (Hons) in African Vertebrate Biodiversity and an MSc with distinction in Botany from Rhodes University. Tarryn's Master's thesis examined the impact of fire on the recovery of C_3 and C_4 Panicoid and non-Panicoid grasses within the context of climate change for which she won the Junior Captain Scott-Medal (Plant Science) for producing the top MSc of 2010 from the South African Academy of Science and Art as well as an Award for Outstanding Academic Achievement in Range and Forage Science from the Grassland Society of Southern Africa. Tarryn specialises in conducting vegetation assessments in South Africa, Mozambique and other African countries. These assessments are often to IFC standards, specifically Performance Standard 6. Tarryn has also undertaken critical habitat assessments for areas requiring biodiversity offsets. Other botanical related work includes, developing alien management plans and biodiversity management and monitoring plans.

EMPLOYMENT EXPERIENCE

Environmental Consultant and Botanical Specialist, EOH Coastal and Environmental Services
May 2012-Present

- Botanical and ecological assessments for local and international EIAs in Southern Africa
- Identifying and mapping vegetation communities and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Designing rehabilitation and biodiversity offset plans
- Designing alien management plans
- Critical Habitat Assessments
- Large ESIA studies
- Managing budgets
- Cape Town branch manager
- Coordinating specialists and site visits

Accounts Manager, Green Route DMC
October 2011- January 2012

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction.

Camp Administrator and Project Co-ordinator, Windsor Mountain International Summer Camp, USA
April 2011 - September 2012

- Co-ordinated staff and camper travel arrangements
- Coordinated main camp events
- Assisted with marketing the camp to prospective families.

Freelance Project Manager, Green Route DMC
November 2010 - April 2011

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction.

Camp Counselor, Windsor Mountain Summer Camp, USA
June 2010 - October 2010

NERC Research Assistant, Botany Department, Rhodes University, Grahamstown in collaboration with Sheffield University, Sheffield, England
April 2009 - May 2010

- Set up and maintained experiments within a common garden plot experiment
- collected, collated and entered data
- Assisted with the analysis of the data and writing of journal articles

Head Demonstrator, Botany Department, Rhodes University
March 2007 - October 2008

Operations Assistant, Green Route DMC
September 2005 - February 2007

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction

PUBLICATIONS

1. Ripley, B.; Visser, V.; Christin, PA.; Archibald, S.; Martin, T and Osborne, C. Fire ecology of C_3 and C_4 grasses depends on evolutionary history and frequency of burning but not photosynthetic type. *Ecology.* 96 (10): 2679-2691. 2015
2. Taylor, S.; Ripley, B.S.; Martin, T.; De Wet, L-A.; Woodward, F.I.; Osborne, C.P. Physiological advantages of C_4 grasses in the field: a comparative experiment demonstrating the importance of drought. *Global Change Biology*. 20 (6): 1992-2003. 2014
3. Ripley, B; Donald, G; Osborne, C; Abraham, T and Martin, T. Experimental investigation of fire ecology in the C3 and C4 subspecies of *Alloteropsis semialata. Journal of Ecology.* 98 (5): 1196 - 1203. 2010
4. South African Association of Botanists (SAAB) conference, Grahamstown. Title: Responses of C3 and C4 Panicoid and non-Panicoid grasses to fire. January 2010
5. South African Association of Botanists (SAAB) conference, Drakensberg. Title: Photosynthetic and Evolutionary determinants of the response of selected C3 and C4 (NADP-ME) grasses to fire. January 2008

COURSES

1. Rhodes University and CES, Grahamstown
   EIA Short Course *2012*
2. Fynbos identification course, Kirstenbosch, 2015.
3. Photography Short Course, Cape Town School of Photography, 2015.
4. Using Organized Reasoning to Improve Environmental Impact Assessment, 2018, International IAIA conference, Durban

CONSULTING EXPERIENCE

International Projects

1. 2020 Critical Habitat Assessment for a graphite mine in Cabo Delgado, Mozambique. This assessment was to IFC standards.
2. 2020 Biodiversity Management Plan and Monitoring Plan for mine at Pilivilli in Nampula Province, Mozambique. This assessment was to IFC standards.
3. 2019: Botanical Assessment for a cocoa plantation, Tanzania.
4. 2019: Critical Habitat Assessment, Biodiversity Management Plan and Ecosystem Services Assessment for JCM Solar Farm in Cameroon.
5. 2019: Undertook the Kenmare Road and Infrastructure Botanical Baseline Survey and Impact Assessment for an infrastructure corridor that will link the existing mine at Moma to the new proposed mine at Pillivilli in Nampula Province, Mozambique. This assessment was to IFC standards.
6. 2012 – Present: Kenmare Terrestrial Monitoring Program Project Manager and Specialist Survey, Nampula Province, Mozambique.
7. 2018: Conducted a field survey and wrote a botanical report to IFC standards for the proposed Balama Graphite Mine Environmental and Social Impact Assessment (ESIA) in Cabo Delgado Province, Mozambique.
8. 2018: Co-authored the critical habitat assessment chapter for the proposed Kenmare Pilivilli Heavy Minerals Mine.
9. 2018: Authored the Conservation Efforts chapter for the Kenmare Pilivilli Heavy Minerals Mine.
10. 2017-2018: Co-authored and analysed data for the Kenmare Bioregional Survey of *Icuria dunensis* (species trigger for critical habitat) in Nampula Province, Mozambique. This was for a mining project that needed to be IFC compliant.
11. 2017: Conducted a field survey and wrote a botanical report to IFC standards for the proposed Ancuabe Graphite Mine Environmental and Social Impact Assessment (ESIA) in Cabo Delgado Province, Mozambique.
12. 2017-2018: Managed the Suni Resources Montepuez Graphite Mine Environmental Impact Assessment. This included the management of ten specialists, the co-ordination of their field surveys, regular client liaison and the writing of the Environmental Impact Assessment Report which summarised the specialists findings, assessed the impacts of the proposed mine on the environment and provided mitigation measures to reduce the impact.
    I was also the lead botanist for this baseline survey and impact assessment and undertook the required field work and analysed the data and wrote the report.
13. 2017: Undertook the botanical baseline survey and impact assessment for the proposed Kenmare Pilivili Heavy Mineral Mine in Nampula Province, Mozambique. This was to IFC Standards.
14. 2017: Ecological Survey for the Megaruma Mining Limitada Ruby Mine Exploration License, Cabo Delgado, Mozambique.
15. 2016: Undertook the botanical baseline survey and impact assessment, wrote an alien invasive management plan and co-authored the biodeiveristy monitoring plan for this farm. The project was located in Zambezia Province, Mozambique.

16. 2015-2016: Conducted the Triton Minerals Nicanda Hills Graphite Mine Botanical Survey and Impact Assessment. Was also the project manager and specialist co-ordinator for this project. The project was located in Cabo Delgado Province, Mozambique.
17. 2015: Was part of the team that undertook a Critical Habitat Assessment for the Nhangonzo Coastal Stream site at Inhassora in Mozambique that Sasol intend to establish drill pads at. This project needed to meet the IFC standards.
18. 2014: Lurio Green Resources Wood Chip Mill and Medium Density Fibre-board Plant, Project Manager and Ecological Specialist, Nampula Province, Mozambique. 2014-2015.
19. 2013-2014: LHDA Botanical Survey, Baseline and Impact assessment, Lesotho.
20. 2014: Biotherm Solar Voltaic Ecological Assessment, Zambia.
21. 2013-2014: Lurio Green Resources Plantation Botanical Assessment, Vegetation and Sensitivity Mapping, Specialist Co-ordination, Nampula Province, Mozambique.
22. 2013: Syrah Resources Botanical Baseline Survey and Ecological Assessment., Cabo Delgado Mozambique.
23. 2013-2014: Baobab Mining Ecological Baseline Survey and Impact Assessment, Tete, Mozambique.

South African Projects

24. 2019: Ecological Assessment for a wind farm EIA, Kleinzee, Northern Cape
25. 2019: Ecological Assessment for construction of satellite antennae, Matjiesfontein, Western Cape
26. 2019: Ecological Assessment for two housing developments in Zeerust, North West Province
27. 2019: Botanical Assessment in Retreat, Cape Town for the DRDLR land claim.
28. 2019: Cape Agulhas Municipality Botanical Assessment for the expansion of industrial zone, Western Cape, South Africa, 2019.
29. 2018: Ecological Assessment for the construction of a farm dam in Greyton, Western Cape.
30. 2018: Conducted the Ecological Survey for a housing development in Noordhoek, Cape Town
31. 2018: Conducted the field survey and developed an alien invasive management plan for the Swartland Municipality, Western Cape.
32. 2017: Undertook the field survey and co-authored a coastal dune study that assesses the impacts associated with the proposed rezoning and subdivision of Farm Bookram No. 30 to develop a resort.
33. 2017: Project managed and co-authored a risk assessment for the use of Marram Grass to stabilise dunes in the City of Cape Town.
34. 2015-2016: iGas Saldanha to Ankerlig Biodiversity Assessment Project Manager, Saldanha.
35. 2015: Innowind Ukomoleza Wind Energy Facility Alien Invasive Management Plan, Eastern Cape Province, South Africa.
36. 2015: Savannah Nxuba Wind Energy Facility Powerline Ecological Assessment, ground truthing and permit applications, Eastern Cape South Africa.

37. 2014: Cob Bay botanical groundtruthing assessment, Eastern Cape, South Africa.
38. 2013-2016: Dassiesridge Wind Energy Facility Project Manager, Eastern Cape, South Africa.
39. 2013: Harvestvale botanical groundtruthing assessment, Eastern Cape, South Africa.
40. 2012: Tsitsikamma Wind Energy Facility Community Power Line Ecological Assessment, Eastern Cape, South Africa.
41. 2012: Golden Valley Wind Energy Facility Power Line Ecological Assessment, Eastern Cape, South Africa.
42. 2012: Middleton Wind Energy Facility Ecological Assessment and Project Management, Eastern Cape, South Africa.
43. 2012: Mossel Bay Power Line Ecological Assessment, Western Cape, South Africa.
44. 2012: Groundtruthing the turbine sites for the Waainek Wind Energy Facility, Eastern Cape, South Africa.
45. 2012: Toliara Mineral Sands Rehabilitation and Offset Strategy Report, Madagascar.

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

Tarryn Martin Date: 7 September 2020

Ms Amber Jackson
Curriculum Vitae

CONTACT DETAILS

Name of Company	**CES – Environmental and Social Advisory Services**
Designation	Cape Town Branch
Position	Principal Environmental Consultant/ Faunal Specialist
Years with firm	Since September 2011
E-mail	a.jackson@cesnet.co.za
Office number	+27 (0)21 045 0900
Nationality	South African
Professional Body	SACNASP: South African Council for Natural Scientific Profession: Professional Natural Scientist (100125/12) International Association of Impact Assessment (IAIAsa) (5812) Herpetological Association of Southern Africa
Key areas of expertise	➢ Environmental and Social Risk Management ➢ Environmental, Social and Health Impact Assessments ➢ Faunal Impact Assessments

PROFILE

Ms Amber Jackson

Amber holds a Masters in Environmental Management from the University of Cape Town and has a background in both Social and Ecological work. Her undergraduate degrees focused on Ecology, Conservation and Environment with particular reference to landscape effects on Herpetofauna, while her masters focused on the environmental management of social and ecological systems. With a dissertation in food security that investigated the complex food system of informal and formal distribution markets. At CES, Amber has been responsible for the management of projects and specialist teams, the preparation and monitoring of project budgets in excess of $500 000. She has managed Environmental, Social and Health Impact Assessments for projects in the renewable, housing, agri-forestry and mining sectors in Mozambique and South Africa to national and international lenders standards including the AfDB, EIB, FSC and IFC. Amber specializes in faunal assessments and has conducted a number of these in the both South Africa and Mozambique to international standards, the majority were assisted by and to Prof Bill Branch. She has recently concluded an Environmental and Social Rik management course with the IFC held in Johannesburg over 2018.

EMPLOYMENT EXPERIENCE

Environmental Consultant, CES
2011 – Present

- Project Management, including budgets, deliverables and timelines.
- Environmental Impact Assessments and Basic Assessments project
- Environmental Control Officer
- Faunal Impact Assessment
- Public/client/authority liaison
- Mentoring and training of junior staff

ACADEMIC QUALIFICATIONS

- 2011 M. Phil Environmental Management (University of Cape Town)
- 2008BSc (Hons) Ecology, Environment and Conservation (University of the Witwatersrand)
- 2007BSc 'Ecology, Environment and Conservation' and Zoology (WITS)

CONTINUING PROFESSIONAL DEVELOPMENT

Herpetological Association of Southern Africa Conference- Cape St Frances
September 2019

International Finance Corporation Environmental and Social Risk Management (ESRM) Program
January – November 2018

IAIA WC EMP Implementation Workshop
27 February 2018

IAIAsa National Annual Conference
Goudini Spa, Rawsonville.
August 2017

Biodiversity & Business Indaba, NBBN
Theme: Moving Forward Together (Partnerships & Collaborations)
April 2017

Snake Awareness, Identification and Handling course, Cape Reptile Institute (CRI)
November 2016

Coaching Skills programme, Kim Coach
November 2016

Western Cape Biodiversity Information Event, IAIAsa
Theme: Biodiversity offsets & the launch of a Biodiversity Information Tool
May 2016

Photography Short Course
Cape Town School of Photography, 2015.

Mainstreaming Biodiversity into Business: WHAT, WHY, WHEN and HOW
Hosted by Dr Marie Parramon Gurney on behalf of the NBBN at the Rhodes Business School,
June 2014

IAIAsa National Annual Conference
Thaba'Nchu Sun, Bloemfontein
September 2013

St Johns Life first aid course
July 2012

CONSULTING EXPERIENCE

Environmental and Social Risk Assessment and Management:

85. Crooks Brothers Post EIA Work- Environmental and Social EMPr, Policies, E&S Management Plans and Monitoring Programmes
86. Blouberg Development Initiative- E&S Risk Assessment

87. Port St Johns Second Beach Coastal Infrastructure Project - E&S Risk Assessment
88. Bankable Feasibility Study of Simandou Infrastructure Project – Port and Railway Summary of critical habitat, biodiversity offset plan and monitoring and evaluation plan.

Environmental and Social Impact Assessments (ESIA) to Lender Standards:

89. Triton Ancuabe Graphite Mine (ESHIA), Mozambique. IFC Standards.
90. Lurio Green Resources Forestry Projects ESIA project upgrade to Lender standards including IFC, EIB, FSC and AfDB.
91. Niassa Green Resources Forestry Projects ESIA to Lender standards including IFC, EIB, FSC and AfDB.
92. Green Resources Woodchip and MDF plant (EPDA).

Faunal Impact Assessments:

93. Kenmare Faunal Biodiversity Management Plan, Mozambique.
94. Kenmare Faunal Monitoring Pogramme (year 1)- Baseline, Mozambique.
95. Kenmare addendum ESIA Faunal Impact Assessment, Mozambique.
96. Kenmare infrastructure corridor ESIA Faunal Impact Assessment, Mozambique.
97. Olam Cocoa Plantation Faunal Impact Assessment, Tanzania.
98. Boulders Powerline BA Faunal desktop impact assessment, WC, SA.
99. JCM Solar Voltaic project Faunal desktop critical habitat assessment, Cameroon.
100. Ramotshere housing development BA Faunal desktop impact assessment, NW, SA.
101. Cape Agulhas Municipality Industrial development faunal impact assessment, WC, SA.
102. SANSA Solar PV BA Faunal desktop impact assessment, WC, SA.
103. Wisson Coal to Urea Faunal desktop assessment, Mpumalanga.
104. Assessment Boschendal Estate Faunal Opportunities and Constraints, WC, SA.
105. Ganspan-Pan Wetland Reserve Recreational and Tourist Development Avifaunal Impact Assessment, NC, SA.
106. Suni Resources Balama Graphite Mine Project (ESIA), Mozambique.
107. City of Johannesburg Municipal Reserve Proclamation for Linksfield Ridge and Northcliff Hill, South Africa.
108. Battery Minerals Montepuez Graphite Mine Project (ESIA), Mozambique.
109. Triton Minerals Nicanda Hills Graphite Mine Project (ESIA), Mozambique.
110. Sasol Biodiversity Assessment
111. Augrabies falls hydro-electric project Hydro-SA (ESIA)
112. Lesotho Highlands Water Project (ESIA), Lesotho.
113. Lurio Green Resources Forestry Projects (ESIA), Mozambique.
114. Malawi Monazite mine Projects (ESIA) EMP ecological management contribution

Coastal Development:

115. Port St Johns Second Beach Coastal Infrastructure Project (EIA), South Africa.
116. PGS Seismic Project (ESIA), Mozambique.
117. Woodbridge Island Revetment checklist.

Renewable Energy:

118. G7 Brandvalley Wind Energy Project (EIA)
119. G7 Rietkloof Wind Energy Project (EIA)
120. G7 Brandvalley Powerlines (BA)
121. G7 Rietkloof Powerlines (BA)

122. Boschendal wine estate Hydro-electric schemes (BA, 24G and WULA)
123. Mossel Bay Wind Energy Project (EIA)
124. Mossel Bay Powerline (BA) 132kV interconnection
125. Inyanda Farm Wind Energy (EIA)
126. Middleton Wind Energy (EIA)
127. Peddie Wind Energy (EIA)
128. Cookhouse Wind Energy Project (EIA)
129. Haverfontein Wind Energy Project (EIA)
130. Plan 8 Wind Energy Project (EIA)
131. Brakkefontein Wind Energy Project (EIA)
132. Grassridge Wind Energy Project (EIA) (Coega)
133. St Lucia Wind Energy Project (EIA)

Estate Projects:
134. Belmont Valley Golf Course and Makana Residential Estate (EIA)
135. Belton Farm Eco Estate (BA).
136. Ramotshere housing development (BA).

Palm Oil Projects:
137. Liberia Palm bay & Butow (ESIA)

Construction audits and Environmental Control Officer (Construction):
138. ACSA ECO CT (Lead ECO)
139. Enel Paleisheuwel Solar farm (Lead ECO)
140. NRA Caledon road upgrade ECO
141. Solar Capital DeAar Solar farm annual audits
142. Eskom Pinotage substation WUL offset compliance

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

AMBER LEAH JACKSON **02 March 2020**

CONTACT DETAILS

Name of Company	**CES – Environmental and Social Advisory Services**
Designation	Cape Town Branch
Profession	Environmental Consultant and Administrator
Years with firm	>2 years
E-mail	cesct@cesnet.co.za
Office number	+27 21 045 0900
Nationality	South African
Professional Body	**IAIA South Africa**: International Association of Impact Assessors South Africa
Key areas of expertise	➢ Assisting with Environmental Impact Assessment processes ➢ Basic Assessments ➢ Report writing ➢ Stakeholder engagement processes and reporting ➢ Field Assistant for Sampling ➢ Specialist Co-ordination and Contracting

PROFILE

Ms Skye Clarke-Mcleod

Skye has almost two years' experience working as an Environmental Consultant for CES. Skye obtained her bachelor's degree in Environmental Management from The University of South Africa whilst working in Hospitality Management. She has been registered as a member of the International Association for Impact Assessment since 2019 and attended their workshop on ECO and Environmental Management Auditing as well as the 5 week course on Environmental Report Writing Skye manages Basic Assessments which includes undertaking client and I&AP liaison, writing the Basic Assessment Report and Environmental Management Plans preparing all the public participation material, conducting research and compiling and interpreting data. Skye's interests include ecosystems management.

EMPLOYMENT EXPERIENCE

- Environmental Consultant - Coastal and Environmental Services Cape Town (2019)

ACADEMIC QUALIFICATIONS

- BA Environmental Management (2018) University of South Africa

CONSULTING EXPERIENCE

Assisting on the Following Projects, April 2019-Present

- **Boulders Wind Farm EIA, Vredenburg**- The key responsibilities on this project were compiling an extensive public participation document in excess of 900 pages documenting all communication between I&AP's and the EAP for the final submission of the EIA report
- **West Coast District Municipality Coastal Management Plan**- Assisted by editing and formatting the five local municipality CMP's as well as the district municipality CMP for final submission.
- **Malawi Department of Environmental Affairs Catchment Management Plan**- The key responsibilities on this project were report coalition, formatting and writing up socio-economic descriptions for the surrounding populations.
- **Ganspan-Pan Resort, Francis Baard Municipality-** The key responsibilities on this project were to include and respond to any comments or questions received during the 30 day review period, consolidate and submit the final report thereafter.
- **EDF Renewables Ecological Baseline Assessment, Kleinsee-** The key responsibilities on this project were as a field assistant to assist the Ecological Specialist with sampling and species identification.
- **Construction Comliance Monitoring:** ACSA Ground Support Equipment Workshop Construction and SANRAL N2 Upgrade, Caledon
- **Coega EIA for Floating Power Plant, Port of Nqura:** Public participation for the scoping report
- **Duiker Street Precinct Development Plan:** Management of the Issues and Responses Trail and incoming comments from I&Aps
- **De Deur , Door of Hope Children's Mission Village and S24G Process:** Assistance in the final submission of Basic Assessment Report and Application for the S24G process
- **South African National Space Agency Satellite Construction, Matjiesfontein-(current)** The key responsibilities on this project were the initial site visit as a field assistant to the ecological specialist, assisting with sampling and species identification, developing a register of I&Aps, engaging with stakeholders, drafting the background information document, drafting the BAR and EMPr,

CERTIFICATION

I, the undersigned, certify that to the best of my knowledge and belief, this CV correctly describes me, my qualifications, and my experience. I understand that any wilful misstatement described herein may lead to my disqualification or dismissal, if engaged.

Skye Clarke-Mcleod Date: 17 October 2020

CURRICULUM VITAE

Jenna Lavin

Tel: (+27) 083 619 0854 (c)
E-mail address: jenna.lavin@gmail.com
ID number: 8512050014089

Address: 103 D'Urban St, Bothasig, Cape Town

EDUCATION:

Tertiary

2011	Continued Professional Development Course in Urban Conservation Management (University of Cape Town) Part I and Part II
2010	M.Sc. with Distinction in Archaeology (University of Cape Town) Title: *Palaeoecology of the KBS member of the Koobi Fora Formation: Implications for Pleistocene Hominin Behaviour.*
2007	B.Sc. Honours in Archaeology (University of Cape Town) Title: *The Lost Tribes of the Peninsula: An Investigation into the historical distribution of Chacma baboons (Papio ursinus) at the Cape Peninsula, South Africa.* Koobi Fora Field School, Rutgers University (U.S.A.)/ National Museums of Kenya
2006	B.Sc. Archaeology (University of Cape Town) B.Sc. Environmental and Geographic Science (University of Cape Town)

Secondary

1999-2003	Rustenburg High School for Girls Firsts in English, Afrikaans, Mathematics HG, Biology HG, History HG, Entrepreneurship.

EMPLOYMENT HISTORY:

PROFESSIONAL DEVELOPMENT
Environmental and Heritage Management:

- ***Director: Heritage for CTS heritage and member of OpenHeritage NPC.***

July 2016 to present

I am a member of the senior management of the company. I am responsible for project management and quality control on all of our heritage-related projects. I provide specialist heritage expertise when required and assist with the drafting of management plans, NIDs, heritage impact assessments and other specialist heritage reports. I liaise with clients, authorities and other specialists to ensure the highest quality product from CTS Heritage. I manage the budgets and financial compliance for all our projects and for the business in general. I also manage the staff in the Heritage Directorate.

I have been involved in developing the online map for the National Resistance and Liberation Heritage Route with DAC, contributing to the Stellenbosch Municipal Heritage Survey (SMHS) among other large-scale projects. The SMHS won an award in 2019. In addition to the SMHS, I have also worked on Municipal Inventories in terms of section 30 of the NHRA within the City of

Cape Town as well as in Saldanha Bay Municipality and Greyton. I have also assisted in drafting the World Heritage Nomination for the "Origins of Modern Humans" serial nomination. In addition, between 2016 and 2020 I have completed over 100 Heritage Impact Assessments, Archaeological Impact Assessments and Heritage Screening Assessments across South Africa.

Through OpenHeritage, I have been intimately involved with the development, and successful implementation of a digital heritage objects management system for the National Museum in Kenya as well as Tristan da Cuhna. We are in the process of rolling out the same system to the new Lesotho National Museum.

- ***Assistant Director for Policy, Research and Planning at Heritage Western Cape (HWC).***

August 2014 to June 2016

As a member of the management structure of HWC, I was responsible for the drafting of new heritage related policy, the grading and declaration of Provincial Heritage Sites, the development of Conservation Management Plans, facilitating the development of inventories of heritage resources through local authorities as well as managing the development of the Western Cape's Heritage Information Management System (HIMS). I was also responsible for managing the project to nominate the Modern Human Origins proposed World Heritage Site.

In this position, on behalf of HWC I engaged with DEADP regarding the development of a Standard Operation Procedure in terms of section 38(8) of the NHRA. Furthermore, I engaged with the CoCT and other Local Authorities in terms of the process around the delegation of powers in terms of the NHRA.

I performed the role of Acting Deputy Director for HWC from April to December 2015, including financial management responsibilities, staff management responsibilities, problem solving and the training of new staff.

- ***Heritage Officer for Palaeontology and for the Mpumalanga Province at the South African Heritage Resources Agency (SAHRA).***

January 2013 to June 2014

Responsibilities in this position included managing palaeontological permit applications in terms of Section 35 of the NHRA and development applications in terms of Section 38 of the NHRA. Projects included the development of a National Palaeotechnic Report identifying significant palaeontological deposits throughout SA, as well as developing professional relationships between SAHRA and the Palaeontological Society of South Africa (PSSA) and the Geological Society of South Africa (GSSA). During this time, I was part of the team that developed the digitised National Palaeontological Sensitivity Map, the first of its kind in the world.

- ***Heritage Officer for Archaeology, Palaeontology and Meteorites at Heritage Western Cape (HWC).***

September 2010 to December 2012

HWC is a Public Entity that forms part of the Heritage Resource Management Component of the Provincial Governments' Department of Cultural Affairs and Sport (DCAS). Projects included the declaration of Pinnacle Point and the West Coast Fossil Park as Provincial Heritage Sites (PHSs), the management of the development of the Baboon Point PHS Conservation Management Plan as well as an educational outreach program as part of the DCAS MOD Centre Project.

- ***Heritage Officer for the Archaeology, Palaeontology and Meteorites Unit of the South African Heritage Resources Agency (SAHRA) as part of a three month contract.***

January 2010 to March 2010

Field Work Experience:

2016-present	Various archaeological and heritage field assessments for specialist archaeological assessments and heritage impact assessments
2010-2016	Various archaeological and heritage field assessments on behalf of HWC and SAHRA
2008-2009	Field Assistant, Dr. D. Braun, Elandsfontein Excavation Locality, University of Cape Town (UCT)
	Field Assistant, Dr. D. Braun, Koobi Fora Research Project (Kenya), Rutgers University, New Jersey
2006	Field Assistant, Damiana Ravasi (PhD), Zoology Department, University of Cape Town.
2005	Research Assistant, Dr. Becky Ackerman, Archaeology Department, University of Cape Town
2004	Field Assistant, Prestwich Place Excavation Locality, Archaeology Contracts Office, UCT

Teaching Positions:

2020	Guest Lecturer, Introduction to South African Heritage Legislation, UCT MPhil: Conservation of the Built Environment
	Guest Lecturer, Introduction to South African Heritage Legislation, Rhodes University: Post Graduate Diploma in Heritage
2019	Guest Lecturer, Introduction to South African Heritage Legislation, UCT MPhil: Conservation of the Built Environment
2017	Guest Lecturer, South African Heritage Legislation, George Washington University Heritage Management Field School
2016	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2015	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2014	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2013	Guest Lecturer, South African Heritage Legislation, Archaeology Honours Course, University of Cape Town
2010	Teaching Assistant, Langebaanweg Field School, Arizona State University
2009	Demonstrator, Archaeology in Practice, University of Cape Town (AGE3013H)
	Demonstrator, Introduction to Geography, Earth and Environmental Science, University of Cape Town (GEO1009F)
	Teaching Assistant, Koobi Fora Field School (Kenya), Rutgers University, New Jersey
	Lecturer, Introduction to Geography, Earth and Environmental Science: Supplementary Course, University of Cape Town (EGS1004S)
	Demonstrator, Elandsfontein Honours Field School, University of Cape Town (AGE4000W)
2008	Demonstrator, Introduction to Geography, Earth and Environmental Science, University of Cape Town (ERT1000F)

Conferences and Papers

2019	ASAPA, Kimerley, RSA: *"Interactive Online Mapping: Using innovative technologies to communicate the significance and relevance of archaeological sites"*
2017	ASAPA, Pretoria, RSA: *"Using Heritage Data to Guide Responsible Development: Tools to ensure high quality recording of heritage sites"*
	ICAHM, Bagomoyo, Tanzania: *"OpenHeritage: Development and implementation of national heritage management systems - Lessons from South Africa, Namibia and Kenya"*
2016	ICAHM, Salalah, Oman: *"Straight to the (Baboon) Point: A look at the Conservation of Archaeological Landscapes in South Africa using Baboon Point as a Case Study"*
2015	Leakey Foundation, Sonoma County, San Fransisco, USA: *""Straight to the (Baboon) Point: A look at the Conservation of Archaeological Landscapes in South Africa using Baboon Point as a Case Study"*
2012	PSSA, Johannesburg, RSA: *"SAHRIS Palaeosensitivity Map - Methodology and Implementation"*

Other

In 2013 I was asked to join the panel of judges for the Ministerial awards for Heritage in the Western Cape. From 2013 to 2014, I was a member of the Heritage Western Cape Archaeology, Palaeontology and Meteorites Committee and I currently sit on the Heritage Western Cape Inventories, Gradings and Interpretations Committee, and have been since 2016.

In November 2013, I was awarded a bursary from the Department of Arts and Culture to complete a Masters in Philosophy in Conservation of the Built Environment through the UCT Faculty of Engineering and the Built Environment in 2014 and 2015. I was in the process of finalising this degree in 2017, however the birth of my son has halted my progress.

I am a paid up member of the Association for Southern African Professional Archaeologists (ASAPA), the Association of Professional Heritage Practitioners (APHP) and I have been a member of the Executive Council of APHP since 2014.

In June 2017, I was selected as Chair of APHP, a position that I currently hold. I am a member of the Palaeontological Society of South Africa (PSSA) and ICOMOS South Africa, for which I am Vice-President of the Board. I am also a member of the International Committee for Archaeological Heritage Management (ICAHM), a committee of UNESCO.

I am an active participant in a not-for-profit company called OpenHeritage which is dedicated to opening access to heritage resources through digital innovation. To this end, we have been involved in a number of projects including Wikipeadia Training with Africa Centre, the development and implementation of a Collections Management System for the National Museums of Kenya and the development of a digital inventory of the Vernacular Architecture of the Eastern Cape.

Referees

Colette Scheermeyer
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Gerhard Gerber
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Andrew Hall
CEO of HWC from 2011 to 2015
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(Currently based in Saudi Arabia)

CEDAR TOWER SERVICES

CURRICULUM VITAE

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EDUCATION:

- M.Sc., Archeology - University of Cape Town (2011)
- B.Sc. (Honours), Archeology - University of Cape Town (2005)
- B.Sc., Archeology and Environmental & Geographical Sciences - University of Cape Town (2004)
- A+ and MCSE - New Horizons, Bloemfontein (1999)
- Matric (Distinction) - St Andrew's School, Bloemfontein (1997)

EMPLOYMENT HISTORY:

December 2013 - present : Cedar Tower Services (Pty) Ltd, Cape Town, South Africa

Position : Owner/Director

April 2015 – present : OpenHeritage, Cape Town, South Africa

Position : Founder

Responsibilities :

• Director of OpenHeritage, a non-profit organisation tasked with rolling out free open source heritage management systems to developing nations

December 2013 - present : Mothers2Mothers - AgeWell Global LLC, (pilot) through Cedar Tower Services Cape Town, South Africa

March 2015 - present : IT Services Consultant to m2m

Responsibilities :

• Currently providing ongoing project support

December 2013 – December 2014 : AgeWell Global LLC Developer

Responsibilities :

• Drupal development of handheld recording system on smartphones and tablets for health data in the older persons sector

November 2011 – November 2013 : South African Heritage Resources

Agency (SAHRA) Cape Town, South Africa

Position : Project Manager & Developer: SAHRIS (The South African Heritage Resource Information System)

Responsibilities :

Design and implement South Africa's first national heritage management system. In summary this involves:

• Planning and selection of a suitable platform to develop SAHRIS

• Planning, selection, installation and setup of dedicated servers using Ubuntu Server OS

• Development of SAHRIS on the Drupal Platform

• Setup of a Geoserver to interface with Drupal

• Live Disaster Recovery Setup

• Installation and setup of mass storage devices (NAS Servers) across multiple data centres

• Setup of replication and backup

• Regular planning and assessment meetings with key stakeholders to outline future system improvements

• Training users, especially of SAHRA and the nine Provincial Heritage Resources Authorities,

and museums

- Creation of training videos and help documentation
- Implementation of the website theme designed by an outside graphic design company
- Data Migration of Sites, Objects, Media Content, Profiles, Reports
- Designing, planning and overseeing SAHRA's Digitisation
- Promotion of SAHRIS and production of peer reviewed articles

November 2008 - June 2010 : Heritage Western Cape Position : Senior Heritage Officer: Archaeology Responsibilities :

- Identify, protect and manage archaeological resources in the Western Cape
- Assess development applications, write policies, nominate sites for Provincial Heritage Site (grade 2) status
- Maintain and update GIS reporting database with SAHRA

Project Involvement: November 2008 – March 2009

- Designed, wrote and implemented database tracking system for applications and issuing of coded Records of Decision
- Implemented and maintained GIS system for archaeological sites, reports and provincial heritage sites
- Worked closely with SAHRA in bringing the GIS Reporting Project to its first release in November 2009
- Ran a workshop in July 2009 to allow all the practitioners in the province to see the demonstration of the database and the updated requirements of the system in terms of the minimum standards
- Involved monthly reporting and quarterly reporting to management as per government policies

December 2007 – September 2011 (and intermittently prior) : Archaeological Consultant, Independent

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IT Contractor & Research Assistant Project Involvement :

African Climate & Development Initiative (ACDI), UCT, Cape Town, 2011

- Design of database system for the ACDI audit of projects, departments, people and research units engaged in climate change related research at UCT
- Pooled various GIS data repositories to initiate discussion around the impacts of CC on the

Cederberg Municipality and prepared the GIS groundwork for a demonstration presentation in May 2011

- Collaborated with the MAPA project to setup the structure for an online solution to hosting the UCT projects audit
- Was also involved in the Southern African Regional Universities Association (SARUA) meeting in March 2011 and presented a Google Earth mapping layer linked to the audit database to provide a possible solution to their collaboration framework. Involved in setup and maintenance of WordPress website for the ACDI and UCT steering committee for the Enterprise Content Management (ECM) project

eastern Cederberg Rock Art Group (eCRAG), Western Cape, 2008

- Archaeological surveys for rock art and other archaeological sites from Wupperthal in the north to Op die Berg in the south of the Cederberg
- Contributed to three Conservation Management Plans handed to each owner for completed properties
- Current number of sites documented: 464
- Created and managed the photographic, digital report and GIS archive

Just Fruit and Veg, Killarney Gardens (July 2008-January 2009, November 2010-February 2011) Spar Ordering System:

- Designed and implemented database system to run the Packing Sheets, Production Totals and automatic exports of the Spar Group's orders to JFV Pastel Accounting system
- The system also imports weekly price updates from their unique pricing system

JFV Pricing System:

- Overhauled an Excel based pricing system which calculated suggested selling prices based on margins and cost inputs
- The new system tracks costs and selling price changes per product and is able to export the new prices across multiple price structures directly in Pastel
- Various choices can be manipulated to derive a new selling price and the database has been coded to prevent accidental errors which cropped up in the Excel based system that relied on macros

HIMAP – Historical Mapping Project, Cape Town, June 2009 – December 2009

• Digitally mapped the historical layers of the 18th century of Cape Town from various historical maps in a project with Dr Antonia Malan

• Combined archival data with the shape files so that various interpretative layers could easily be generated

ACO Prestwich Place, Cape Town, April 2008 – August 2008

• Design and implementation of database system for the Prestwich Place burials

• This includes a GIS mapping of the data and a 3d modelling tool for point cloud data using VRML

Iziko Museums, Cape Town, December 2007 – March 2008

• Design of interactive multimedia exhibit displayed in the rock art collection comprising a selection from the Bleek & Lloyd Archive and the Warmhoek rock art trail in Clanwilliam

Masters (& partly Honours) Project at UCT, Cape Town, 2005, 2008-2011

• Design of database system for the SARU archaeological records

• This involved the digitisation of 10 000 slides and the organisation of all the digital photographs taken since 2001

• All the site records were physically scanned and typed up, mapped on GIS and linked relationally to my system

• Archive generated over 250 gigabytes of data

Genex, Cape Town, July 2007 – October 2007

• Project managed the migration of the accounting systems from Accpac for Windows to Fincon Accounting

• Ran the Accounting department on a short term basis as caretaker before taking on another project at Ellies in Maputo, Mozambique

Millennium Foods, Killarney Gardens, June 2007 Ordering System:

• Designed and implemented networked database system to capture EDI orders from Checkers and to automate standing orders from their other customers

• The system also exports these orders directly into Pastel Accounting and runs their packing and production reports

Ellies Electronics, Cape Town, February - May 2006

- Project managed the migration of the accounting systems from Accpac (DOS version) to Fincon Accounting
- Setup and installed Windows NT server and email server

Kardex and Tracking Systems, Bloemfontein, November 1999 - February 2000

- Designed two database systems to track stock in a multi-company environment, produce dispatch labels and to automate tripsheets

January - July 2007 : Archaeological Contractor Responsibilities :

- Contract work undertaken for the Archaeological Contracts Office at UCT & Cape Archaeological Survey.
- Cape Nature Archaeological Survey Project from July 2007 – December 2007.

January 2006 – November 2007 : Fincon Position : IT Consultant Responsibilities :

- Training, installation and Accountancy services
- Main clients: Ellies Cape Town, Ellies Maputo, IT Outlook, Genex, Toshiba Central

1998 – 2002 :

- Spent two full years as well as two short term periods working and travelling in Europe and the UK

REFERENCES:

Professor John Parkington, Supervisor at UCT 079 872 4807

Raymond Berkmann, Ellies Electronics, Cape Town 021 532 2225

Dr Janette Deacon, APM Committee, HWC, Cape Town 082 491 5067

Mamakomoreng Nkhasi EO, Corporate Affairs, SAHRA 021 462 4502

Dr Mitchell Besser, Mothers2Mothers, Cape Town 021 466 9160

Name:	JOHN EDWARD ALMOND
Profession:	PALAEONTOLOGIST / GEOLOGIST / EDUCATOR
Date of Birth:	27 MAY 1959
Parent Company:	*NATURA VIVA* CC, PO Box 124 10 Mill Street, CAPE TOWN 8010, RSA
Position in Company:	MANAGING MEMBER
Years with Company:	17
Years of experience:	35 (palaeontological and geological research)
Nationality:	UK (RSA Permanent Resident)
HDI Status:	White male
Education:	Dorking County Grammar School, Surrey, UK
	BA (Hons.) Natural Sciences (Zoology), University of Cambridge, 1980
	Part II (Hons.) Natural Sciences (Geology), University of Cambridge, 1981
	PhD (Palaeontology), University of Cambridge, 1986

Professional Qualifications: PhD in Earth Sciences (Palaeontology), University of Cambridge, UK (1986).

Languages:	Reading	Speaking	Writing
English:	Good	Good	Good
German:	Good	Fair	Fair
Spanish:	Good	Fair	Limited
French:	Fair	Limited	Limited
Afrikaans:	Fair	Limited	Limited

- Deutsche Mittelstufeprufung (Goethe-Institut, Schwäbisch-Hall)
- Curso de Español (Superior Alto), Universidad de Salamanca

Membership of Professional Bodies:

- Palaeontological Society of South Africa (PSSA)

- Geological Society of South Africa (Western Cape)
- Association of Heritage Assessment Practitioners (AHAP)

BRIEF SUMMARY OF WORK EXPERIENCE:

1981-1990
- Visiting Scientist to various academic institutions (universities, museums) in the USA, Czech Republic, France, South Africa, Sudan, Germany: palaeontological research (Palaeozoic invertebrates)

1985-1988
- Research Fellow, Corpus Christi College, Cambridge University: palaeontological research (Palaeozoic invertebrates)
- Undergraduate teaching (course supervisor), extra mural lecturing (Workers Educational Association)

1989-1990
- Humboldt Foundation Postdoctoral Research Fellow, University of Tübingen, Germany: palaeontological research (Palaeozoic invertebrates and trace fossils)
- Deutsche Mittelstufeprufung (Goethe-Institut, Schwäbisch-Hall)

1991-1998
- Scientific Officer (Palaeontology), Council for Geoscience, South Africa: palaeontological field work and research in Western and Northern Cape, Namibia (Late Precambrian – Palaeozoic fossil biotas), collaboration with foreign scientists, curation of Bellville fossil collections, member of SACS Biostratigraphy Committee, Chairman of Western Cape Branch of Geological Society of SA
- Adult education (*e.g.* UCT and SA Museum Summer School Programmes)

1998-2000
- Field guide registration and training in South Africa (FGASA, Field Guides Association of South Africa) and Namibia (NATH)
- Curso de Español (Superior Alto), Universidad de Salamanca
- Palaeontological research (Palaeozoic fish and trace fossils)
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2000-2015
- Establishment of private company *Natura Viva* cc (Cape Town), specializing in natural history excursions, adult educational courses (geology / palaeontology / botany / astronomy / zoology *etc*), public lectures, developing databases for nature reserves - especially in the arid west of southern Africa (RSA, Namibia), palaeontological heritage assessments, palaeontological and geological consultancy
- Development of science educational materials for schools in geology / fossils / evolution: textbooks, teacher training courses (new GET, FET science curricula)
- Scientific research: Late Proterozoic to Palaeozoic invertebrates, trace fossils, fish of RSA and S. Namibia; Mid Palaeozoic glacial events (Cape Supergroup); trace fossils, invertebrates, petrified wood and vertebrate remains, Karoo Supergroup; geobotanical relationships in arid areas (Great and Little Karoo)

- Field supervision of undergraduate geology mapping projects (University of Cambridge)
- Re-organisation of W. Cape fossil collections, Council for Geoscience (Bellville)
- Reviews of regional palaeontological records on a provincial basis (W. Cape, E. Cape, N. Cape) for South African Heritage Resources Agency (SAHRA), Heritage Western Cape (HWC);
- Geological and palaeontological contributions to 1: 250 000 geology sheet explanations for Council for Geoscience (Clanwilliam, Loeriesfontein, Alexander Bay sheets)
- Organization of 15th Biennial Conference of the Palaeontological Society, Matjiesfontein (Laingsburg), September 2008.
- Geological and palaeontological fieldwork in Madagascar with team from the Council for Geoscience (2012)
- Fossil heritage conservation and management in the Cape region, RSA (Archaeology, Palaeontology & Meteorites Committee, Heritage Western Cape); numerous palaeontological heritage assessment studies for developments in Western, Northern and Eastern Cape, Free State, Mpumalanga, Gauteng, Limpopo and Northwest

Selected publications and reviewed research reports

(*excluding* the great majority of palaeontological impact assessment reports):

- ALMOND, J.E. 1985a. The Silurian-Devonian fossil record of the Myriapoda. Philosophical Transactions of the Royal Society, London B309, 227-237, pl. 1.
- ALMOND, J.E. 1985b. A vermiform problematicum from the Dinantian of Foulden, Berwickshire, Scotland. Transactions of the Royal Society of Edinburgh (Earth Sciences) 76, 41-47.
- ALMOND, J.E. 1985c. Les arthropleurides du Stephanien de Montceau-les-Mines, France. Bull. Hist. Soc. nature. Autun 115, 59-60.
- ALMOND, J.E. 1986. Studies on Palaeozoic Arthropoda, 322pp, 21 pls. Unpublished PhD thesis, University of Cambridge, UK.
- WHITTINGTON, H.B. & ALMOND, J.E. 1987. Appendages and habits of the Upper Ordovician trilobite *Triarthrus eatoni*. Philosophical Transactions of the Royal Society, London B317, 1-46, pls. 1-10.
- KLITZSCH, E., ALMOND, J., BARAZI, N., EL HASSAN, A., MANSOUR, N. & SEMTNER, A. 1990. Short note on recently discovered Paleozoic strata of NE Sudan (Red Sea Hills). Berliner geowissenschaftliche Abhandlungen (A) 120.1, 87-88.
- BRIGGS, D.E.G. & ALMOND, J.E. 1994. The arthropleurids from the Stephanian (Late carboniferous) of Montceau-les-Mines (Massif Central,

France). In: Poplin, C. & Heyler, D. (Eds.) Quand le Massif Central était sous l'équateur. Un écosystème carbonifère à Montceau-les-Mines, 127-135. Paris.

- ALMOND, J.E. & EVANS, F.J. 1996. Early - Middle Devonian fish faunas from the Bokkeveld Group, South Africa. Abstracts, 9th Biennial Conference of the Palaeontological Society of South Africa, September 1996, Stellenbosch, 1p.
- ALMOND, J.E. & GRESSE, P.G. 1996. Traces and dubiofossils from the Late Precambrian – Cambrian of South Africa. Abstracts, 9th Biennial Conference of the Palaeontological Society of South Africa, September 1996, Stellenbosch, 1p.
- ALMOND, J.E., ROBERTS, D., & AVERY, G. 1996. Fossil sites in the southwestern Cape. Excursion Guide, 9th Biennial Conference of the Palaeontological Society of South Africa, September 1996, Stellenbosch, 46 p.
- ALMOND, J.E. 1997. Fish fossils from the Devonian Bokkeveld Group of South Africa. Stratigraphy. African Anthropology, Archaeology, Geology and Palaeontology 1(2): 15-28.
- ALMOND, J.E. 1998a. Early Palaeozoic trace fossils from southern Africa. Tercera Reunión Argentina de Icnologia, Mar del Plata, 1998, Abstracts p. 4.
- ALMOND, J.E. 1998b. Trace fossils from the Cape Supergroup (Early Ordovician – Early Carboniferous) of South Africa. Journal of African Earth Sciences 27 (1A): 4-5.
- ANDERSON, M.E., ALMOND, J.E., EVANS, F.J. & LONG, J.A. 1998. Devonian (Emsian-Eifelian) fishes from the Lower Bokkeveld Group (Ceres Subgroup) of South Africa. Journal of African Earth Sciences 27 (1A): 7-8.
- BRADDY, S.J. & ALMOND, J.E. 1998. Eurypterid trackways from the Table Mountain Group (Ordovician) of South Africa. Journal of African Earth Sciences 27 (1A): 34-36.
- ALMOND, J.E. 1998c. Non-marine trace fossils from the western outcrop area of the Permian Ecca Group, southern Africa. Tercera Reunión Argentina de Icnologia, Mar del Plata, 1998, Abstracts p. 3.
- ALMOND, J.E. 1998d. Vendian-Early Palaeozoic biotas of the Western and Northern Cape Provinces, South Africa (Nama and Vanrhynsdorp Groups, Cape Supergroup). Excursion Guidebook, Gondwana-10 Post-conference Field Trip Po3b, 36pp.
- SMITH, R.M.H. & ALMOND, J.E. 1998. Late Permian continental trace assemblages from the Lower Beaufort Group (Karoo Supergroup), South Africa. Tercera Reunión Argentina de Icnologia, Mar del Plata, 1998, Abstracts p. 29.

- ALMOND, J.E., EVANS, F.J., & COTTER, E. 1998. Young Gondwana records. Cape Supergroup field trip. Excursion guidebook, Gondwana-10, 28 June–04 July 1998, Cape Town, Department of Earth Sciences, University of Cape Town, 64 pp., table and maps.
- FRIMMEL. H.E. ALMOND, J.E. & GRESSE, P.G. 1998. Gariep Belt and Nama Basin. Excursion guidebook, Gondwana-10, 28 June–04 July 1998, Cape Town, Department of Earth Sciences, University of Cape Town, 75 pp.
- BRADDY, S.J. & ALMOND, J.E. 1999. Eurypterid trackways from the Table Mountain Group (Ordovician) of South Africa. Journal of African Earth Sciences 29: 165-177.
- ANDERSON, M.E., ALMOND, J.E., EVANS, F.J. & LONG, J.A. 1999. Devonian (Emsian-Eifelian) fish from the Lower Bokkeveld Group (Ceres Subgroup), South Africa. Journal of African Earth Sciences 29: 179-194.
- ANDERSON, M.E., LONG, J.A., EVANS, F.J., ALMOND, J.E., THERON, J.N. & BENDER, P.A. 1999. Biogeographic affinities of Middle and Late Devonian fishes of South Africa. Records of the Western Australian Museum, Supplement No. 57: 157-168.
- ALMOND, J.E. 2000. Geology and palaeontology of central northern Namibia. Unpublished field guide prepared for NATH (Namibian Academy for Tourism and Hospitality) Windhoek, 45 pp.
- WILSON, H.M. & ALMOND, J.E. 2001. New euthycarcinoids and an enigmatic arthropod from the British Coal Measures. Palaeontology 44, 143-156.
- FOURIE, J. & ALMOND, J. 2001. Advanced nature guiding, 148 pp. The Nature College, Cape Town.
- ALMOND, J.E. 2002a. Giant arthropod trackway from the Lower Ecca Group (Mid-Permian) of the Great Karoo, South Africa. Conference programme and abstracts, 12th Biennial Conference of the Palaeontological Society of South Africa, October 2002, Bloemfontein.
- ALMOND, J.E. 2002b. Giant arthropod trackway, Ecca Group. Geobulletin 45: p28.
- DE BEER, C.H., GRESSE, P.G., THERON, J.N. & ALMOND, J.E. 2002. The geology of the Calvinia area. Explanation to 1: 250 000 geology Sheet 3118 Calvinia. 92 pp. Council for Geoscience, Pretoria.
- ALMOND, J., MARSHALL, J. & EVANS, F. 2002. Latest Devonian and earliest Carboniferous glacial events in South Africa. Abstracts, 16th International Sedimentological Congress, RAU, Johannesburg, pp 11-12.
- MARSHALL, J.E.A., ASTIN, T.R., EVANS, F. & ALMOND, J. 2002. The palaeoclimatic significance of the Devonian – Carboniferous boundary. In: Geology of the Devonian System. Proceedings of the International Symposium, Syktyvkar, Republic of Komi, Russia, pp. 23-25.

- ALMOND, J.E., COLE, D.I. & VLOK, A-L. 2003. Preliminary report on geology / botany relationships in the Groenefontein Nature Reserve, near Calitzdorp, Western Cape Province. Council for Geoscience Report Number 2003-0201, 40 pp. Council for Geoscience, Pretoria.
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Grade 10 teacher's book, 224 pp. Cambridge University Press, Cambridge etc.

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- ALMOND, J.E. 2013d. Proposed 16 Mtpa expansion of Transnet's existing manganese ore export railway line & associated infrastructure between Hotazel and the Port of Ngqura, Northern & Eastern Cape. Part 2: De Aar to the Coega IDZ, Northern and Eastern Cape. Palaeontological specialist assessment: combined desktop and field-based study, 76 pp. Natura Viva cc, Cape Town.
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Dr John E. Almond
***Natura Viva* cc**
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CAPE TOWN 8010
(021) 462 3622

Bruce Eitzen

Professional Landscape Architect

Accreditation: SACLAP Credential ID 20127

South African Council for Landscape Architecture Professionals

Tel: 021 782 8890

Email: neworld@telkomsa.net

4 Lower Kildare Crescent, Fish Hoek, Cape Town, 7975

Bruce is a registered Landscape Architect and Environmental Planner with the South African Council of Landscape Architecture Professionals (SACLAP) and Specialist Practitioner in Visual and Landscape Heritage with thirty years of experience across the board of landscape architecture and environmental planning. And has practised in South Africa, Central Africa and East Africa. He holds a BSc (Botany) from the University of Cape Town and a Masters in Landscape Architecture from the University of Pretoria. He served for three years three years on the Association of Professional Heritage Practitioners (APHP) Executive Committee chairing Professional Practice. He also served on the National Executive Committee of the Institute for Landscape Architects in South Africa (ILASA) and was the Chair of ILASA Cape for four years. He also chaired the Local Organising Committee for the International Federation of Landscape Architect's 2012 World Congress (IFLA 2012) held in Cape Town

Education

BSc Botany 1984: University of Western Cape

ML, Landscape Architecture 1988: University of Pretoria

Experience

Director:
New World Associates, Landscape Architects, Cape Town
2003 – Present
Practice relocated to Cape Town in 2003 and offers services in Landscape Architecture, Environmental, Visual and Heritage Planning.

Director:
New World Associates, Landscape Architects (Zimbabwe) Harare
1995 – 2003
Landscape Architects and Environmental Planners.

Managing Director:
EDP (Zimbabwe) Harare
1991– 1995
Landscape Architects and Environmental Planners

Associate at
EDP, Randburg
1988 – 1991
Graduate Landscape Architect in this firm of Landscape Architects and Environmental Planners becoming Associate in 1991.

Visual Planning Projects

- **Harcroft, Constantia: VIA preparation for a historic estate of 10 ha in Upper Constantia located on the boundary of the TMNP.**
- **Saldanha Separator Plant, Vredenburg: Preparation of the VIA for a heavy industrial development in a semi-rural area on the West Coast.**
- **Novo Power Wind Farm, Vredenburg: Preparation of the VIA for an extensive industrial development in the Vredenburg Peninsula, West Coast.**
- **Moerasrivier Mine, George: Preparation of VIA for gravel quarry in the George area.**
- **Khoisan Bay, De Kelders: Revision of earlier VIA with new project details.**
- **Scarborough, Peninsula: Preparation of VIA and visual guidelines for residential development on urban edge in a highly scenic coastal hamlet.**
- **Brakkloof, Plettenberg Bay: Preparation of VIA for proposed residential development on urban edge near the outstanding Robberg Peninsula.**
- **De Doorns, SW Cape: Preparation of VIA for proposed service station in this historic wine town on a scenic route.**
- **6A Marine Drive, Paarden Eiland: Preparation of VIA for building on Marine Drive with outsize billboard facades.**
- **ESKOM Tiekos Substation, Langebaan: Preparation of VIA for a proposed substation and section of power lines in this popular tourist area near Club Mykonos.**
- **Zevenwacht Service Station, Kuil's River: Preparation of Visual Comment for proposed service station in Kuil's River.**
- **Garden Route East, George: Preparation of VIA for proposed regional shopping mall in scenic George on the Garden Route.**
- **Middagkrans, Franschhoek: Preparation of VIA for post-modern boutique hotel in historic Franschhoek.**
- **Milkwood Mall, Hawston: Preparation of VIA for regional shopping centre on a scenic route.**
- **Camps Bay Retreat, Cape Town: Photography in preparation of VIA for proposed expansion at this historic landmark site.**
- **89 on Victoria, Sea Point: Preparation of VIA for proposed apartment complex on Victoria Road, Sea Point.**

- Hangberg VIA, Hout Bay: Preparation of VIA for proposed township extension under the Hangberg in scenic Hout Bay.
- 1 4-Jay Road, Milnerton: Visual comment for billboard on side of building.
- Citrusdal WWTW, Citrusdal: Preparation of VIA for an upgrade to Citrusdal's sewage treatment infrastructure.
- Topcliffe, Somerset West: Preparation of VIA for a subdivision on the Helderberg in deep forest in heritage smallholding.
- Langezandt Quays, Struisbaai: Preparation of VIA for a key hotel on the harbour in this small resort town.
- Hermanus Regional Shopping Centre: Preparation of VIA for a major regional shopping centre in this resort town.
- Breede Valley Ultra City, Worcester: Preparation of VIA for a newly sited twin Ultra City on the N1 near Worcester.
- Welbeloond, Durbanville: Preparation of VIA for a major gateway development on the N7 entrance to Cape Town and gateway to the Durbanville Hills Wine Route.
- Gavin's Plaas, Saldanha: Preparation of VIA for a massive industrial site adjacent to the Fossil Park. High visual, palaeontological and botanical impacts to be accommodated – in progress.
- Khoisan Bay, De Kelders: Preparation of VIA for a large residential expansion adjacent to the R43 coastal road and adjacent nature reserve.
- Royal Palms, Paarl: Preparation of VIA for a residential estate in the historic Dal Josaphat area with special reference to impact on heritage resources.
- Somerset Hospital, Green Point: Preparation of VIA for new alternative to a controversial high rise redevelopment of this historic site next to Fortress Wynyard and the Waterfront.
- Lion's Hill, Tamboerskloof: Preparation of VIA for apartment complexes on a highly exposed hillside with dense mixed woodland below Lion's Head.
- Dido Valley, Simon's Town: Joint preparation of visual components of HIA for a high mixed residential development on a marginal site.
- Schoonspruit, Malmesbury: Preparation of VIA for a residential development around a high profile, grand Victorian house complete with turret.
- Glen Lily, Malmesbury: Preparation of VIA for a large expansion of N Malmesbury on veterinarian horse farm sited on a 17th century church erf including realignment of the urban edge.
- Koringberg, Swartland: Preparation of VIA for a very high density residential development in this historic church town.
- De Draay, Hermanus: Preparation of VIA for a residential development on a former flower farm around the famous Heuningklip.

- Voorwaarts, Tulbagh: Preparation of VIA for a residential estate on the western entrance to historic Tulbagh.
- Waverenskroon, Tulbagh: Preparation of VIA for a massive mixed residential, school, hotel and equestrian estate on an historic estate with important Renosterveld component in Tulbagh.
- Haasendal, Kuils River: Preparation of VIA for a massive residential development around the Kuils River Golf Course at the gateway to the Stellenbosch Wine Route.
- Compagnes Drift, Bot River: Preparation of Level 3 VIA for proposed low density housing on 20 Ha of this historic 18th century wine farm of 500 Ha on the edge of the Kogelberg Biosphere Reserve.
- Aan de Weber, Jamestown: Preparation of Level 3 VIA for this small housing estate of several hectares adjacent to historic Jamestown, Stellenbosch.
- Riverside, Stanford: Preparation of VIA Scoping for a large, prominently sited, residential estate outside the urban edge near the historic 18th century hamlet of Stanford in the Overberg.
- Lang Gelegen, Pearly Beach: Preparation of VIA Scoping for an extensive coastal resort development outside the urban edge in this resort town.
- Botmaskop Hotel and Conference Centre, Stellenbosch: Preparation of Level 3 VIA for this controversial resort development on Helshoogte Pass between Stellenbosch, Pniël and Franschhoek.
- Langezandt Fishermen's Village, L'Agulhas: Preparation of Heritage/Urban Design VIA for development of controversial housing project in the vernacular fishermen's cottage style.
- Hout Bay Erwen 4869/-71: Preparation of Visual Statement for small residential/resort development above Hout Bay in a highly visible location.
- Blueberry Hills, St Helena Bay: Preparation of VIA for coastal hillside residential area in the picturesque West Coast.
- House Grigoryan, Steenberg: Preparation of extensive, Level 4 VIA for a luxury house above the historic 17th century Steenberg Estate in the south peninsula, CT

APPENDIX G3: EAP UNDERTAKING UNDER OATH

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

South African National Space Agency (SANSA) Basic Assessment for Radio Antennae and Scientific Instruments for Deep Space Exploration, Matjiesfontein, Western Cape

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
2. This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.environment.gov.za/documents/forms.
3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed, emailed, delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Environment House
473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at
Email: EIAAdmin@environment.gov.za

1. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP Company Name:	Coastal and Environmental Services			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	1	Contribution level (indicate 1 to 8 or non-compliant)	135%
EAP name:	Dr Ted Avis			
EAP Qualifications:	BSc Rhodes University, 1983 BSc Honours Rhodes University, 1984 PhD Rhodes University, 1993			
Professional affiliation/registration:	SACNASP: South African Council for Natural Scientific Profssionals EAPSA: Environmental Assessment Practitioner Southern Africa MRSSAF: Member of the Royal Society of South Africa BotSoc: Botanical Society of South Africa SAAB: South African Association of Botanists SAIE&ES: South African Institute of Ecologists and Environmental Scientists IAIA: International Association of Impact Assessment			
Physical address:	67 African Street, Grahamstown, Eastern Cape, South Africa			
Postal address:	67 African Street, Grahamstown, Eastern Cape, South Africa			
Postal code:	6140	Cell	082 783 6393	
Telephone:	0210450900	Fax		
E-mail:	t.avis@cesnet.co.za			

The appointed EAP must meet the requirements of Regulation 13 of GN R982 of 04 December 2014, as amended

2. DECLARATION BY THE EAP

I, Ted Avis, declare that –

- I act as the independent environmental assessment practitioner in this application;
- I have expertise in conducting environmental impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I will take into account, to the extent possible, the matters listed in Regulation 13 of the Regulations when preparing the application and any report relating to the application;
- I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
- I will perform all obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act.

Disclosure of Vested Interest (delete whichever is not applicable)

Details of EAP: Declaration and Undertaking Under Oath

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;
- ~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~

Signature of the Environmental Assessment Practitioner

CES Environmental and Social Advisory Services
Name of Company:

15/10/2020
Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, Anthony Mark Avis, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Environmental Assessment Practitioner

~~CES Environmental and Social Advisory Services~~
Name of Company

15/10/2020
Date

Signature of the Commissioner of Oaths

15.10.2020
Date

LYNN SMIT
COMMISSIONER OF OATHS
REFERENCE NUMBER: 9/1/8/2 EAST LONDON
25 TECOMA STREET, BEREA
EAST LONDON, 5214

APPENDIX G4: SPECIALIST DECLARATIONS

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

South African National Space Agency (SANSA) Basic Assessment for Radio Antennae and Scientific Instruments for Deep Space Exploration, Matjiesfontein, Western Cape

Kindly note the following:

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3. A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
4. All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
5. All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

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473 Steve Biko Road
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Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

Details of Specialist, Declaration and Undertaking Under Oath

Page 1 of 3

1. SPECIALIST INFORMATION

Specialist Company Name:	CES Environmental and Social Advisory Services (			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	1	Percentage Procurement recognition	135%
Specialist name:	Ms Tarryn Martin			
Specialist Qualifications:	MSc Botany (Rhodes University)			
Professional affiliation/registration:	SACNASP: South African Council for Natural Scientific Profession: Professional Natural Scientist (400018/14) SAAB: Member of the South African Association of Botanists IAIASa: Member of the International Association for Impact Assessments South Africa Member of Golden Key International Honour Society			
Physical address:	30 Chudleigh Road, Plumstead, 7800			
Postal address:	67 African Street			
Postal code:	6140	Cell:	N/A	
Telephone:	021 045 0903	Fax:	27 (86) 410 7822	
E-mail:	t.martin@cesnet.co.za			

2. DECLARATION BY THE SPECIALIST

I, Tarryn Martin , declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

CES Environmental and Social Advisory Services

Name of Company:

14 October 2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _____Tarryn Martin__, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

CES Environmental and Social Advisory Services

Name of Company

14 October 2020

Date

Signature of the Commissioner of Oaths

14 October 2020

Date

LYNN SMIT
COMMISSIONER OF OATHS
REFERENCE NUMBER: 911/8/2 EAST LONDON
25 TECOMA STREET, BEREA
EAST LONDON, 5214

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

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473 Steve Biko Road
Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:
Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	CES Environmental and Social Advisory Services (			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	1	Percentage Procurement recognition	135%
Specialist name:	Ms Amber Jackson			
Specialist Qualifications:	M. Phil Environmental Management (University of Cape Town)			
Professional affiliation/registration:	South African SACNASP: South African Council for Natural Scientific Profession: Professional Natural Scientist (100125/12) International Association of Impact Assessment (IAIAsa) (5812) Herpetological Association of Southern Africa			
Physical address:	Third Avenue, Kenilworth, Cape Town, 7708			
Postal address:	67 African Street			
Postal code:	6140	Cell:	N/A	
Telephone:	021 045 0900	Fax:	27 (86) 410 7822	
E-mail:	a.jackson@cesnet.co.za			

2. DECLARATION BY THE SPECIALIST

I, Amber Jackson, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

CES Environmental and Social Advisory Services

Name of Company:

26 October 2020

Date

Details of Specialist, Declaration and Undertaking Under Oath

3. **UNDERTAKING UNDER OATH/ AFFIRMATION**

I, _____Amber Jackson__, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

CES Environmental and Social Advisory Services

Name of Company

26 October 2020

Date

Signature of the Commissioner of Oaths

26TH OCTOBER 2020

Date

LYNN SMIT
COMMISSIONER OF OATHS
REFERENCE NUMBER: 9/1/6/2 EAST LONDON
25 TECOMA STREET, BEREA
EAST LONDON, 5214

environmental affairs
Department
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

	(For official use only)
File Reference Number:	
NEAS Reference Number:	DEA/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

South African National Space Agency (SANSA) Basic Assessment for Radio Antennae and Scientific Instruments for Deep Space Exploration, Matjiesfontein, Western Cape

Kindly note the following:

1. This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
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Departmental Details

Postal address:
Department of Environmental Affairs
Attention: Chief Director: Integrated Environmental Authorisations
Private Bag X447
Pretoria
0001

Physical address:
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Environment House
473 Steve Biko Road
Arcadia

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Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	CTS HERITAGE			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	
Specialist name:	JENNA LAVIN			
Specialist Qualifications:	MSC ARCHAEOLOGY			
Professional affiliation/registration:	ASAPA APHP			
Physical address:	34 HARRIES ST, PLUMSTEAD			
Postal address:				
Postal code:		Cell:	083 619 0854	
Telephone:		Fax:		
E-mail:	jenna.lavin@ctsheritage.com			

2. DECLARATION BY THE SPECIALIST

I, JENNA LAVIN, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
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- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of the Specialist

CTS HERITAGE

Name of Company:

19/10/2020

Date

Details of Specialist, Declaration and Undertaking Under Oath

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, JENNA LAVIN, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

CTS HERITAGE

Name of Company

19/10/2020

Date

JOHANNES H.S. MATTHEUS

Signature of the Commissioner of Oaths

Date

SUID-AFRIKAANSE POLISIEDIENS
SUPPORT HEAD - MUIZENBERG
19 OCT 2020
SUPPORT HEAD - MUIZENBERG
SOUTH AFRICAN POLICE SERVICE

environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

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Environment House
473 Steve Biko Road
Arcadia

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Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	CTS HERITAGE			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	
Specialist name:	Nicholas Wiltshire			
Specialist Qualifications:	MSc, Archaeology			
Professional affiliation/registration:	ASAPA, APHP			
Physical address:	34 Harries Street, Plumstead, Cape Town			
Postal address:	34 Harries Street, Plumstead, Cape Town			
Postal code:	7800	Cell:	082 303 7870	
Telephone:	087 073 5739	Fax:		
E-mail:	nic.wiltshire@ctsheritage.com			

2. DECLARATION BY THE SPECIALIST

I, _Nicholas Wiltshire_____, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
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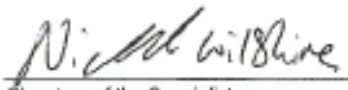
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

CTS HERITAGE

Name of Company:

20 October 2020

Date

Details of Specialist, Declaration and Undertaking Under Oath

3. **UNDERTAKING UNDER OATH/ AFFIRMATION**

I, _Nicholas Wiltshire_____, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

N. Wiltshire

Signature of the Specialist

CTS HERITAGE

Name of Company

19 OCTOBER 2020

Date

Signature of the Commissioner of Oaths

19TH October 2020

Date

LYNN SMIT
COMMISSIONER OF OATHS
REFERENCE NUMBER: 9/1/8/2 EAST LONDON
25 TECOMA STREET, BEREA
EAST LONDON, 5214

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

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Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	NATURA VIVA CC			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition	100
Specialist name:	Dr John Edward Almond			
Specialist Qualifications:	PhD (palaeontology)			
Professional affiliation/registration:	Palaeontolgical Society of Southern Africa, Association of Professional Heritage Practitioners (W Cape)			
Physical address:	76 Breda Park, Breda Street, Oranjezicht, CAPE TOWN			
Postal address:	PO Box 12410 Mill Street, Cape Town			
Postal code:	8010	Cell:	n/a	
Telephone:	021 462 3622	Fax:	n/a	
E-mail:	naturaviva@universe.co.za			

2. DECLARATION BY THE SPECIALIST

I, **Dr John Edward Almond**, declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

John E. Almond

Signature of the Specialist

NATURA VIVA CC

Name of Company:

20 October 2020

Date

Details of Specialist, Declaration and Undertaking Under Oath

3. **UNDERTAKING UNDER OATH/ AFFIRMATION**

I, **Dr John Edward Almond**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

John E. Almond

Signature of the Specialist

NATURA VIVA CC

Name of Company

20 October 2020

Date

Signature of the Commissioner of Oaths

20TH OCTOBER 2020

Date

LYNN SMIT
COMMISSIONER OF OATHS
REFERENCE NUMBER: 9/1/8/2 EAST LONDON
25 TECOMA STREET, BEREA
EAST LONDON, 5214

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Arcadia

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Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	**New World Associates Landscape Architects**			
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)		Percentage Procurement recognition	
Specialist name:	**Bruce Eitzen**			
Specialist Qualifications:	**BSc ML**			
Professional affiliation/registration:	**PrLArch**			
Physical address:	**4 Lower Kildare Crescent, Fish Hoek**			
Postal address:	**7975**			
Postal code:	**WC**	Cell:	**082-222-2113**	
Telephone:	**021-782-8890**	Fax:	**NA**	
E-mail:	**neworld@telkomsa.net**			

2. DECLARATION BY THE SPECIALIST

I, Bruce Eitzen declare that --

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
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- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Bruce Eitzen.

Signature of the Specialist

New World Associates Landscape Architects

Name of Company:

9 November 2020

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Bruce Eitzen**, , swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Bruce Eitzen.

Signature of the Specialist

New World Associates Landscape Architects
Name of Company

09TH NOVEMBER 2020
Date

Signature of the Commissioner of Oaths

09.11.2020
Date

LYNN SMIT
COMMISSIONER OF OATHS
REFERENCE NUMBER: 9/1/8/2 EAST LONDON
25 TECOMA STREET, BEREA
EAST LONDON, 5214

REFERENCES

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