

JOINT LAND USE PLANNING APPLICATION MOTIVATION REPORT

TO

KAREEBERG MUNICIPALITY

Application made in terms of the Kareeberg Municipal Planning By-Law (2015) read together with the Kareeberg Municipal Land Use Scheme (2022)

KAROO HOOGLAND MUNICIPALITY

Application made in terms of the Karoo Hoogland Municipal Planning By-Law (2015) read together with the Karoo Hoogland Municipal Land Use Scheme (2022)

HANTAM MUNICIPALITY

Application made in terms of the Spatial Planning and Land Use Management Act (2013) read together with the Hantam Land Use Scheme (2021)

PROJECT NO: NATI11679.44

28 August 2024 (Rev.)

On behalf of:

Prepared by:

TABLE OF CONTENTS

SECTION A: INTRODUCTION	6
1 BACKGROUND AND CONTEXT OF THE APPLICATION	6
1.1 BACKGROUND TO SKA	6
1.2 STRUCTURE OF THE DOCUMENT	8
1.2.1 SUPPLEMENTARY DOCUMENTATION	8
SECTION B: THE PROJECT SITE	9
2 SITE INFORMATION	9
2.1 LOCATION AND CONTEXT	9
2.2 PROPERTY DETAIL	10
2.3 EXISTING INFRASTRUCTURE	14
2.3.1 GRID POWER NETWORK	16
2.3.2 LANDING STRIP	16
2.4 CURRENT LAND-USE	16
SECTION C: APPLICATION CONTEXT	18
3 HISTORY OF THE APPLICATION PROCESS	18
3.1 DECLARATION OF ASTRONOMY ADVANTAGE AREAS	18
3.1.1 KAROO CORE ASTRONOMY ADVANTAGE AREA	18
3.1.2 KAROO CENTRAL ASTRONOMY ADVANTAGE AREAS	19
3.2 INITIAL APPROVALS OBTAINED	19
3.2.1 ENVIRONMENTAL APPROVALS IN RESPECT OF MEERKAT CONSTRUCTION	19
3.2.2 WATER LICENCES	20
3.2.3 WASTE MANAGEMENT LICENCES	20
3.2.4 MINING PERMITS	21
3.2.5 REZONING APPROVAL	21
4 EXCLUSION FROM THE REQUIREMENT TO OBTAIN ENVIRONMENTAL AUTHORISATION	22
4.1 STRATEGIC ENVIRONMENTAL ASSESSMENT	22
4.1.1 STATE OF THE ENVIRONMENT	23
4.2 FINDINGS OF THE ASSESSMENTS	24
4.3 ENVIRONMENTAL CONSTRUCTION AUDITS	
5 RECORD OF DECISION – NATIONAL HERITAGE RESOURCES ACT 25 OF 1999	27
6 SUBDIVISION OF AGRICULTURAL LAND ACT 70 OF 1970	28
7 EXEMPTION IN TERMS OF MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 28 OF 2002	29
SECTION D: APPLICATION DETAILS	30
8 LAND USE PLANNING AND ASSOCIATED ASPECTS	30
8.1 REZONING	30
8.1.1 APPLICATION TO KAROO HOOGLAND MUNICIPALITY	31

8.1.2	APPLICATION TO KAREEBERG MUNICIPALITY	33
8.1.3	APPLICATION TO HANTAM MUNICIPALITY	34
8.2	REGISTRATION OF SERVITUDES	35
8.3	SITE DEVELOPMENT PLAN / BUILDING PLANS	35
8.4	COMMENTS TO BE OBTAINED DURING THE LAND USE MANAGEMENT PROCESS.....	35
SECTION E: PROJECT PROPOSALS		37
9	RATIONALE FOR THE PROPOSED INFRASTRUCTURE PROJECT	37
10	DEVELOPMENT COMPONENTS	37
11	EXTENDED ASTRONOMY ZONE: PROPOSED DEVELOPMENT & INFRASTRUCTURE	38
11.1	SKA DISH ANTENNAS.....	38
11.2	PHOTOVOLTAIC PLANTS	39
12	ENGINEERING, ACCESS AND SECURITY SERVICES	40
12.1	ACCESS AND ROADS.....	40
12.2	ELECTRICITY & FIBRE-OPTIC CABLES.....	43
12.3	WATER DEMAND AND SUPPLY	47
12.4	SEWAGE AND EFFLUENT MANAGEMENT.....	49
13	MANAGEMENT OF CONSTRUCTION AND OPERATIONAL PHASES	49
13.1	CONSTRUCTION CONTROL.....	49
13.2	OPERATIONAL MANAGEMENT	49
SECTION F: COMPLIANCE WITH RELEVANT POLICY		50
14	RELEVANT PLANNING POLICY AND FRAMEWORKS	50
14.1	NORTHERN CAPE ENVIRONMENTAL IMPLEMENTATION PLAN	50
14.2	NORTHERN CAPE GROWTH AND DEVELOPMENT STRATEGY.....	50
14.3	NORTHERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK.....	51
14.3.1	SPATIAL DEVELOPMENT STRATEGY 1: ENHANCE REGIONAL CONNECTIVITY	53
14.3.2	SPATIAL DEVELOPMENT STRATEGY 2: PROTECT AND MANAGE BIODIVERSITY, WATER AND AGRICULTURAL RESOURCES	54
14.4	PIXLEY KA SEME DISTRICT MUNICIPALITY.....	56
14.4.1	INTEGRATED DEVELOPMENT PLAN.....	56
14.4.2	SPATIAL DEVELOPMENT FRAMEWORK	57
15.5	NAMAKWA DISTRICT MUNICIPALITY	57
15.5.1	INTEGRATED DEVELOPMENT PLAN.....	57
14.5.2	SPATIAL DEVELOPMENT FRAMEWORK	58
14.6	KAREEBERG LOCAL MUNICIPALITY.....	59
14.6.1	INTEGRATED DEVELOPMENT PLAN.....	59
14.6.2	SPATIAL DEVELOPMENT FRAMEWORK	60
14.6.2.1	KEY DEVELOPMENT STRATEGIES	61
14.6.2.2	COMPOSITE MACRO SPATIAL DEVELOPMENT FRAMEWORK	62
14.7	KAROO HOOGLAND LOCAL MUNICIPALITY	62
14.7.1	INTEGRATED DEVELOPMENT PLAN.....	62
14.7.2	SPATIAL DEVELOPMENT FRAMEWORK	63

14.7.2.1	KEY DEVELOPMENT STRATEGIES	63
14.7.2.2	COMPOSITE MACRO SPATIAL DEVELOPMENT FRAMEWORK	63
14.8	HANTAM LOCAL MUNICIPALITY.....	627
14.8.1	INTEGRATED DEVELOPMENT PLAN.....	627
14.8.2	SPATIAL DEVELOPMENT FRAMEWORK	637
14.8.2.1	KEY DEVELOPMENT STRATEGIES	637
14.8.2.2	COMPOSITE MACRO SPATIAL DEVELOPMENT FRAMEWORK	637
15	LEGISLATIVE CONTEXT	69
15.1	DEVELOPMENT PRINCIPLES	69
15.1.1	SPATIAL JUSTICE.....	69
15.1.2	SPATIAL SUSTAINABILITY	69
15.1.3	EFFICIENCY	69
15.1.4	SPATIAL RESILIENCE	69
15.1.5	GOOD ADMINISTRATION	70
SECTION G: CONCLUSION		71

LIST OF FIGURES

	Page No.
Figure 1: The project site in context of the SKA1_MID phases.	7
Figure 2: Document structure.	8
Figure 3: The project site in context of the Karoo Hoogland, Hantam and Kareeberg Municipalities.	9
Figure 4: MeerKat.	15
Figure 5: KAT-7.	15
Figure 6: HERA.	15
Figure 7: SKA Site Complex.	16
Figure 8: Bushmanland Vloëre; Quiver Tree Forest; dolerite boulders and rounded inselbergs generally occurring in the centre of the project site.	17
Figure 9: Very High sensitivity terrestrial ecology and biodiversity features.	25
Figure 10: Very high sensitivity aquatic ecosystem features.	25
Figure 11: Heritage resources within the project site.	26
Figure 12: Heritage Sensitivity Map.	28
Figure 13: Composite map of the proposed SKA infrastructure on the project site.	31
Figure 14: Model of Antenna Foundation; Completed Foundation; shutter work prior to concrete casting; reinforcing steel for pile cap.	39
Figure 15: Composite map of estimated locations of existing road upgrades and new access roads to be constructed during SKA1_MID.	40
Figure 16: Composite map indicating the electrical and fibre optic cables to be constructed.	44
Figure 17: Composite Spatial Vision for the Northern Cape Province.	53
Figure 18: Northern Cape Development Zones.	55
Figure 19: Protected Areas Expansion.	56
Figure 20: Namakwa District Municipality SDF.	59
Figure 21: Macro Composite Map for Kareeberg Municipality.	61
Figure 22: SARAO Micro SDF.	62
Figure 23: Karoo Hoogland Macro Composite Map.	65
Figure 24: SARAO Micro SDF.	66
Figure 25: Hantam Macro Composite Map.	59

LIST OF TABLES

	Page No.
Table 1: Property details of land units located in the Karoo Hoogland Municipality.	10
Table 2: Property details of land units located in the Kareeberg Municipality.	12
Table 3: Property details of land units located in the Hantam Municipality.	13
Table 4: Environmental approvals obtained in respect of the construction and operation of the MeerKAT.	19
Table 5: List of detailed specialist assessments.	23
Table 6: Additional Technical Studies.	24
Table 7: Summary of proposed rezoning of the project site.	31

Table 8:	Zoning and land uses applied for on the project site located in Karoo Hoogland Municipality.	32
Table 9:	Zoning and land uses applied for on the project site located in Kareeberg Municipality.	33
Table 10:	Zoning and land uses applied for on the project site located in Hantam Municipality.	34
Table 11:	Distances of existing road upgrades and new access roads to be constructed in Karoo Hoogland Municipality.	41
Table 12:	Distances of existing road upgrades and new access roads to be constructed in Kareeberg Municipality.	42
Table 13:	Distances of existing road upgrades and new access roads to be constructed in Hantam Municipality.	43
Table 14:	Length of electrical and fibre optic cables in Karoo Hoogland Municipality.	45
Table 15:	Length of electrical and fibre optic cables in Kareeberg Municipality.	46
Table 16:	Length of electrical and fibre optic cables in Hantam Municipality.	47
Table 17:	Estimated SKA1_MID daily water demand.	48

SECTION A: INTRODUCTION

1 BACKGROUND AND CONTEXT OF THE APPLICATION

The National Research Foundation ("NRF"¹) through its National Facility, the South African Radio Astronomy Observatory ("SARAO") is responsible for managing all radio astronomy initiatives and facilities in South Africa, including the existing MeerKAT Radio Telescope as well as coordinating South Africa's contribution to the infrastructure and engineering and construction planning for the Square Kilometre Array Radio Telescope (generally referred to as "SKA").

The SKA, in short, is a radio telescope to be built in South Africa and Australia which will have a total collecting area of approximately one (1) square kilometre. It will operate over a wide range of frequencies and its size will make it 50 times more sensitive, and up to 10 000 faster (in terms of its survey speed) than the best radio telescopes of today. It will be powerful enough to detect radio waves from objects millions or even billions of light years away from Earth (a light year is the distance light can travel in one year, at a velocity of 300 000 km/s.)

1.1 BACKGROUND TO SKA

The history of the SKA dates to the early 1990's with an international effort by the International Union of Radio Science's Large Telescope Working Group to build the world's largest and most sensitive radio telescope to help better understand the history of the universe.

For 10 years (1997 to 2007), the International Square Kilometre Array Steering Committee ("ISSC") worked on preparing an International Collaboration Agreement for the SKA Programme, which agreement became effective on 1 January 2008. This Agreement was signed by the European Union, United States, and Canadian SKA Consortia, the Australian SKA Coordination Committee, the NRF in South Africa, the National Astronomical Observatories in China, and the National Centre for Radio Astrophysics in India and culminated in an invitation to submit proposals to host the envisaged SKA project.

South Africa was one of five countries who, in 2003, submitted proposals to host the SKA. The application process ended in 2005 with South Africa and Australia been shortlisted as contenders. In 2012, following a comprehensive technical and scientific assessment of the South African and Australian sites, the independent SKA Site Advisory Committee selected Africa as the preferred site. In an effort to maximise the use of the investments already made by both contenders, it was decided that the SKA should be co-hosted by South Africa along with its African Partner Countries² and Australia.

Subsequently the International SKAO announced that the extensive SKA mid-frequency dish array would be developed in Africa, and the more compact low-frequency aperture array would be constructed in Australia. This decision was made based on its analysis of technical and scientific factors, cost factors, and implementation plans.

Taking into consideration various technical, scientific and cost factors, and implementation plans it was ultimately decided that the SKA is to be constructed in two phases:

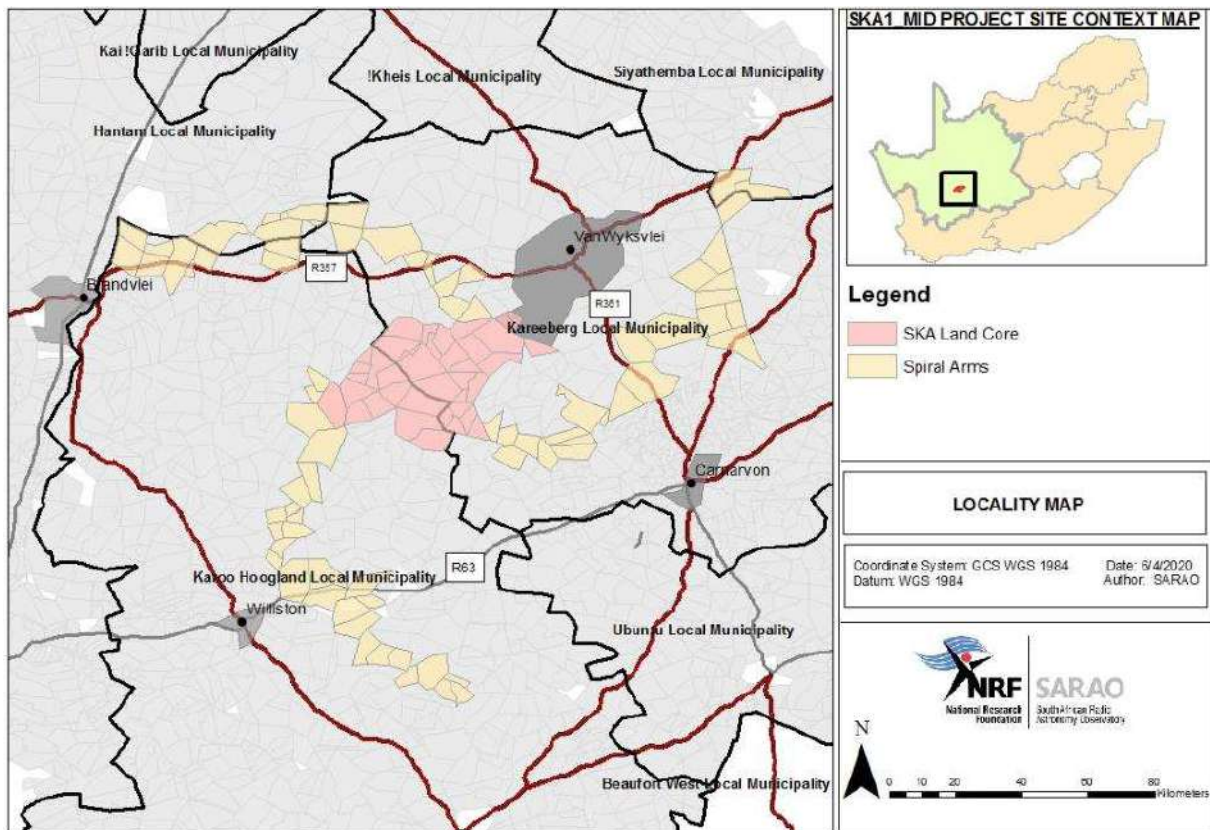
¹ The NRF, as an entity of the Department of Science and Innovation, was established as an independent government agency, through the National Research Foundation Act (Act No 23 of 1998) to primarily promote and support research through funding, human resource development and the provision of National Research Facilities in all fields of natural and social sciences, humanities and technology, and thereby contribute to the improvement of the quality of life of all South Africans.

² Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia.

- Phase 1 (called SKA1) in South Africa and Australia, and
- Phase 2 (called SKA2) expanding in South Africa and into SKA Africa partner countries with the component in Australia also being expanded.

The SKA Phase 1 consist of an array of 197 dish-antennas, incorporating the 64-dish MeerKAT radio telescope, and associated infrastructure, and is referred to as SKA1_MID. The majority of the SKA1_MID infrastructure is constructed on NRF-owned land while approximately 1200 hectares of privately owned land, forming part of the identified spiral arms, will be required for the construction of the remaining dish-antennas. It is envisaged that the SKA1_MID will be implemented as follows (refer to Figure 1 below):

- **SKA Land Core:** The rezoning of, and subsequent construction on, the NRF-owned land comprising 37 farm units, 121 838 hectares in extent. The rezoning of the SKA Land Core had been completed with the granting of the rezoning by the Kareeberg and Karoo Hoogland Municipalities on 5 May 2021, and 28 April 2021, respectively. Construction of the SKA Land Core project officially commenced on 14 September 2021 whereafter a number of dish-antennas and supporting infrastructure were developed.
- **Spirals Arms:** A further 1 200 hectares of privately owned land will be required for the construction of 21 dish-antennas and supporting infrastructure in three spiral arms which will affect approximately 73 farm units. The farming units (hereinafter referred to as the "project site") upon which the dish-antennas will be established and upon which the necessary servitudes will be registered is the subject of this application (refer to paragraph 2.2 for detailed description of the project site).



1.2 STRUCTURE OF THE DOCUMENT

This document consists of eight sections (including this introductory section) (refer to Figure 2), which, together with the annexures illustrate how the project site is to be rezoned in order to make provision for the proposed spiral arms of the SKA1_MID project and taking in consideration the concept design of SKA phase 2.

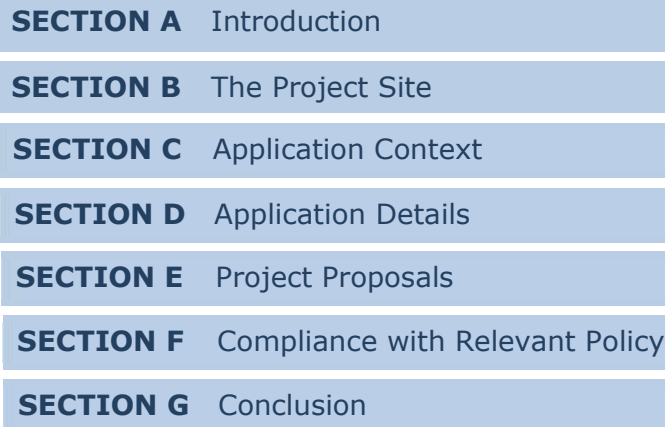


Figure 2: Document structure.

1.2.1 SUPPLEMENTARY DOCUMENTATION

The document is to be read together with the annexures listed below.

Annexure 1:	List of Plans
Annexure 2:	Power of Attorney
Annexure 3:	Title Deeds & Conveyancer Certificate
Annexure 4:	Land Surveyor's Diagrams
Annexure 5:	<u>Existing Zoning Approvals</u>
Annexure 5.1:	Kareeberg Municipality Rezoning Approval, 15 February 2012: Farm Mey's Dam No. 68
Annexure 5.2:	Karoo Hoogland Municipality Rezoning Approval, 16 October 2012: Remainder and Portion 1 of Farm Losberg No. 73
Annexure 5.3:	Kareeberg Municipality Rezoning Approval dated 5 May 2021
Annexure 5.4:	Karoo Hoogland Municipality Rezoning Approval dated 28 April 2021
Annexure 6:	<u>Environmental Related Approvals</u>
Annexure 6.1:	Exclusion from requirement to obtain Environmental Authorisation PLEASE NOTE: Due to the sheer volume of the IEMP same has not been included herewith but is available on request from the NRF.
Annexure 6.2:	Water Licences in respect of existing infrastructure
Annexure 6.3:	Waste Management Licences
Annexure 6.4.1:	Mining Permits in respect of existing borrow pits
Annexure 6.4.2:	Mining Exemption in terms of Sections 16, 20, 22 & 27 of MPRDA
Annexure 6.5:	Heritage Record of Decision
Annexure 7:	Memo in respect of applicability of SALA
Annexure 8:	<u>Land Use Planning Application Forms</u>
Annexure 8.1:	Kareeberg Municipality
Annexure 8.2:	Karoo Hoogland Municipality
Annexure 8.3:	Hantam Municipality

SECTION B: THE PROJECT SITE

2 SITE INFORMATION

2.1 LOCATION AND CONTEXT

The project site is located on the north-western corner of the Great Karoo, a vast semi-arid area of the Northern Cape Province, which is generally considered as a relatively remote part of South Africa.

It straddles the boundary of the Karoo Hoogland, Hantam and Kareeberg local municipalities, which, in turn, is located in the Pixley ka Seme District Municipality and Namakwa District Municipality respectively.

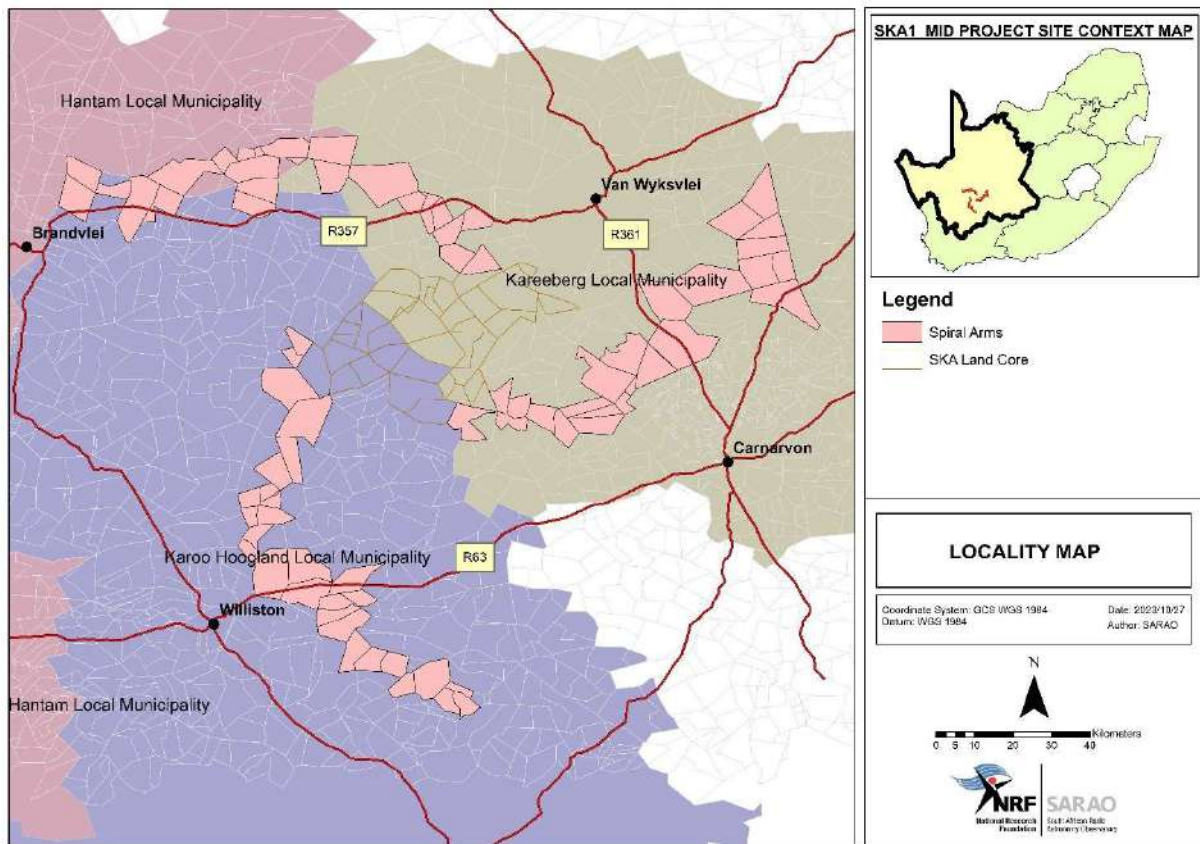


Figure 3: The project site in context of the Karoo Hoogland, Hantam and Kareeberg local municipalities.

The three spiral arms extend in an outward direction from the SKA Land Core in a north-western, southern and north-eastern direction towards. The spiral arms are referred to by the name of the town in which direction it extends, namely the Brandvlei Spiral Arm (1), the Williston Spiral Arm (2) and the Carnarvon/Van Wyksvlei Spiral Arm (3).

The major roads servicing the area is the R63 between Carnarvon and Williston, the R361 (via R386) between Carnarvon and Van Wyksvlei from where the R357 will take you to Brandvlei.

The circle route throughout the study area is completed by the R353 from Brandvlei which joins the R63 at Williston.

2.2 PROPERTY DETAIL

The SKA1_MID site, also referred to as the Spiral Arms or project site, comprises of the Brandvlei, Williston and Carnarvon Spiral Arms – named after the towns in which direction the arms extend. The Spiral Arms, which is the subject of this application, comprise of 64 land units covering 268 192.98 hectares in extent. The properties, or portions thereof, is specifically required to construct the SKA project. It is noted that the 40 land units which comprised the SKA Land Core area has already been rezoned and is thus excluded from this application.

Whilst the NRF will not be acquiring the land units comprising the spiral arms, it has entered into agreements with the relevant property owners to register the servitudes necessary to establish the required infrastructure. Almost 80% of the servitudes have been registered in general terms, with 50 having been registered in the Kimberley Deeds Office, a further 12 have been notarially executed with only 2 still to be executed (agreements have been signed).

The Power of Attorneys from the relevant farm owners are attached herewith under Annexure 2.

The land units comprise of a combined area of 268 192.98ha. 32 farming units covering an area of approximately 113 838 ha is located in the jurisdiction of the Karoo Hoogland Municipality, 26 farm units covering 131 770 ha falls within the Kareeberg municipal jurisdiction, while the remaining 6 farm units covering an area of 22 583 ha falls within the Hantam Municipality.

The table below provides a summary of the properties applicable to this application³.

Table 1: Property details of land units located in the Karoo Hoogland Municipality.

KAROO HOOGLAND MUNICIPALITY (All land units are located in the Karoo Hoogland Municipality, Division Fraserburg)				
FARM DESCRIPTION	OWNER	SIZE (ha)	TITLE DEED	SERVITUDE STATUS
Remainder of the Farm Stemregt No. 68	Albertus du Toit Blomerus	1306.3698	T22222/2004	K31/2023S
Remainder of the Farm Die Tuin No. 493	Nicolaas van Schalkwyk	3078.5744	T30323/1972	PN12/2024
Portion 1 (Wilda) of the Farm Die Tuin No. 493	Louwsdrift Trust	3078.5706	T31429/2000	PN7/2024
The Farm Zand Puts No. 77	Philippus Hermanus Marais	8673.7712	T38487/1996	K122/2022S
The Farm Bissies en Anteel Kolk No. 91	Biesies Boerdery Trust	9486.6772	T20683/2005	K120/2022S
Remainder of the Farm Dassie Kloof No. 105	Dawid Frederik Johannes Louw	4282.7751	T8049/2002	K119/2023S

³ K[number]S under the column 'Servitude Status' implies that the servitude has been registered in the Kimberley Deeds Office. PN implies that the Notarial Deed of Servitude has been notarially executed and filed in the Notary's Protocol.

Remainder of the Farm Oest No. 107	Dawid Frederik Johannes Louw	4500.9943	T65385/2015	K119/2023S
Remainder of the Farm Koega No. 108	Francois Louw	1267.3011	T71180/2012	K133/2023S
Portion 2 (Klipbank) of the Farm Koega No. 108	Charl Francois Langner	2032.0840	T11167/2003	K111/2023S
Remainder of Portion 3 of the Farm Koega No. 108	Francois Louw	1180.3721	T71180/2012	K133/2023S
Portion 4 (a portion of Portion 3) of the Farm Koega No. 108	Francois Louw	88.1547	T71180/2012	K133/2023S
Portion 1 (Uitkomst) of the Farm Friesland No. 200	Klipdrift Trust	2505.4790	T56522/2013	K93/2023S
Remainder of the Farm Bloem-Fontein No. 119	Estate late Johannes Theron	3051.6665	T15753/1987	PN13/2024
Remainder of the Farm Klip Drift No. 203	Jasper Michael Hoon	6002.7076	T21507/2013	K3/2024S
Remainder of Portion 1 (Vadersklip) of the Farm Korfsplaas No. 204	WFO Trust	1188.3754	T59867/1998	K87/2023S
The Farm Weltevrede No. 205	WFO Trust	2209.3829	T59867/1998	K87/2023S
Portion 1 (Jacobus Daal) of the Farm Bloem-Fontein No. 119	Francois Louw	1511.4463	T71180/2012	K133/20223S
Remainder of Portion 1 (Browns Laage) of the Farm Vaalhoek No. 120	Jakobus Esterhuizen	2074.7976	T35485/2013	K123/2023S
Portion 2 (a portion of Portion 1) of the Farm Vaal Hoek No. 120	Francois Louw	1439.2571	T71180/2012	K133/2023S
The Farm Riet Kolk No. 6	Elpie Louw	5840.5889	T5411/1973	K123/2022S
Remainder of Portion 1 (Vos Zyn Vlei) of the Farm Vos Zyn Vlei No. 7	Dirk Johannes Louis Husselmann	2569.6088	T67351/1998	K124/2022S
The Farm Sunny Side No. 8	Marthinus Dawid Gous	8624.9846	T11728/1977	K64/2023S
Remainder of the Farm Abiquas Puts No. 9	Willem Petrus Louw	4138.9282	T94086/2005	K106/2022S
The Farm Leeuw Krantz No. 134	WM Symington Familie Trust	6356.1098	T121414/2003	PN6/2024
Remainder of the Farm Ongelukfontein No. 135	Willem Abraham van Schalkwyk B-E Trust	8897.5481	T15475/1961	
Remainder of the Farm Zakfontein No. 148	Jacobus Nel Louw	6732.6755	T34966/1993	K97/2023S
Remainder of the Farm Langbaken No. 149	Jacobus Nel Louw	4934.0952	T97994/1998	K97/2023S
Portion 2 of the Farm Langbaken No. 149	Langbaken Trust	5078.6082	T628/2002	K88/2023S
The Farm Tierkop No. 51	Albertus Du Toit Blomerus	2287.2430	T2222/2004	K31/2023S

Remainder of the Farm Palmiet Fontein No. 171	Rus & Vrede Familietrust	4353.8708	T33595/1994	K135/2023S
Remainder of the Farm Korfsplaats No. 204	Stofkraal Trust	2267.6942	T71255/2002	K1/2024S
Remainder of the Farm Scheerkraal No. 5	Daniel Arnoldus Snyman	4129.8790	T52814/1995	K109/2022S

Table 2: Property details of land units located in the Kareeberg Municipality.

KAREEBERG MUNICIPALITY (All land units are located in the Kareeberg Municipality, Division Carnarvon)				
PROPERTY DESCRIPTION	OWNER	SIZE (ha)	TITLE DEED	SERVITUDE STATUS
Remainder of the Farm Waterval No. 497	Etresia Elizabeth Van Wyk & Antoinette Van Tromp	5171.8801	T21233/1996	K129/2018S
Remainder of the Farm Paarde Vlei No. 73	Dwaalberg Landgoed (Pty) Ltd.	8174.0277	T10533/1973	K80/2023S
Remainder of the Farm Garst Kolk No. 74	Litau Landgoed (Pty) Ltd.	12497.4309	T78883/2006	PN9/2024
The Remainder of the Farm Wolf Werf No. 23	Wolfberg CC	6706.9739	T23145/1986	K94/2022S
The Farm Riet Kops Kolk No. 25	Hardemans Karoo (Pty) Ltd.	12079.9420	T2699/2018	PN8/2024
Portion 1 of the Farm Thomas Pan No. 38	Johannes Benjamin van der Westhuizen	3731.4046	T20213/1986	PN11/2024
Portion 4 (a portion of Portion 3) of the Farm Thomas Pan No. 38	Gannapan Boerdery CC	6482.8674	T62607/1993	PN2/2024
Remainder of the Farm Bottel Put No. 48	Johannes Benjamin van der Westhuizen	5670.7442	T25987/2007	PN11/2024
Portion 1 of the Farm Bottel Put No. 48	Johannes Benjamin van der Westhuizen	5136.1371	T20213/1986	PN11/2024
Portion 2 of the Farm Bottel Put No. 48	Johannes Benjamin van der Westhuizen	3253.0344	T20213/1986	PN11/2024
Portion 2 (Goei Hoop) of the Farm Groot Kolk No. 57	Easton James-Trustees	3170.9648	T55319/1999	K2/2023S
Portion 4 (Grootkolk) of the Farm Groot Kolk No. 57	Pieter Daniel van Wyk	3171.0292	T88604/1995	K142/2023S
Remainder of the Farm Moffys Dam No. 58	Nicholaas Franciscus Petrus de Klerk	2459.3218	T4841/2018	K108/2022S
Portion 1 of the Farm Moffys Dam No. 58	Nicholaas Franciscus Petrus de Klerk	2459.2890	T4841/2018	K108/2022S
Portion 3 of the Farm Moffys Dam No. 58	Guillaum du Toit	2473.7529	T76453/2000	K95/2022S
Portion 1 of the Farm Jagt Pan No. 62	Kareeberg Municipality	3698.7524	T18010/2007	K138/2023S

Portion 1 of the Farm Vlak Leegte No. 491	Maria Louw	2997.6820	T91746/1997	
Portion 1 (Geluk) of the Farm Uitspan-Kolk No. 499	Edna German (previously Jacobs)	3230.2844	T92642/1994	K1/2023S
The Farm Bitterpoort No. 576	Bonnza Boerdery (Pty) Ltd.	12360.5848	T2120/2003	K99/2022S
Remainder of Portion 3 of the Farm Thomas Pan No. 38	Gannapan Boerdery CC	6367.3738	T63262/1987	K4/2024S
Portion 1 (Dubbelde Vlei Noord) of the Farm Dubbelde Vlei No. 63	Kareeberg Municipality	3443.1526	T18009/2007	K138/2023S
The Farm Kareekloof No. 490	Burger Developments (Pty) Ltd.	8739.7220	T1502/2024	PN18/2024
Portion 9 of the Farm Jagersberg No. 72	Daan Vermeulen Trust	6558.0499	T51544/2010	K108/2023S
Remainder of the Farm Uitspan-Kolk No. 499	Jan Hermans Le Roux Jacobs	3345.4403	T5461/1985	K97/2022S
Remainder Portion 2 (Bondeblaf Oos) of the Farm Honde Blaf No. 493	Engela Adriana Rossouw	2583.2789	T48583/2012	K100/2022S
Portion 3 (portion of Portion 1) of the Farm Honde Blaf No. 493	Spring Lights 26 (Pty) Ltd.	2411.9566	T3668/2017	K110/2022S
The Farm Jagterskloof No. 593	Spring Lights 26 (Pty) Ltd.	2142.9733	T73727/2014	K110/2022S

Table 3: Property details of land units located in the Hantam Municipality.

HANTAM MUNICIPALITY (All land units are located in the Hantam Municipality, Division Fraserburg)				
PROPERTY DESCRIPTION	OWNER	SIZE (ha)	TITLE DEED	SERVITUDE STATUS
Remainder of the Farm Zout Poort No. 10	Japie Folscher Trust	8384.7000	T112375/1997	K65/2023S
Portion 1 (Klipkoppies) of the Farm Jan Louws Leegte No. 11	Charl Andries Cilliers de Villiers	428.2648	T25811/2011	K111/2022S
Portion 5 of the Farm Jan Louws Leegte No. 11	Nicholas Johannes Folscher	1993.2106	T80974/1999	PN6/2023
Remainder of the Farm Kameel Boom Puts No. 13	Charl Andries Cilliers de Villiers	4589.8807	T25811/2011	K111/2022S
Portion 2 (a portion of Portion 1) of the Farm Jan Louw Kolk No. 14	Charl Andries Cilliers de Villiers	428.2674	T25811/2011	K111/2022S
Portion 3 of the Farm Jan Louws Leegte No. 11	BV Boerdery Dienste CC	1062.0983	T7391/2014	K128/2023S

There are no restrictive title deed conditions prevalent in either one of the holding deeds that would prevent the construction of the proposed SKA1_MID and the development of its associated infrastructure.

The project site is currently zoned **Agricultural Zone**, which typically makes provision for 'agriculture' and related activities as a primary use. The latter is defined in the respective land use schemes of the Kareeberg and Karoo Hoogland local municipalities as follows:

"Agriculture means the cultivation of land for crops, plants, trees or the breeding of animals, or the operation of a game farm on natural veld or land; it includes such only activities and buildings which are reasonably connected with the main agricultural activity on the land, including a dwelling house(s) and workers accommodation, but does not include abattoirs, feed-pen farming, aquaculture or other defined consent uses".

The definition of 'agricultural use' in the Hantam Land Use Management Scheme (2021) is somewhat similar. This scheme defines it as follows:

'Means the cultivation of crops and plants and/or the breeding of animals, as well as the operation of a game farm on an extensive basis on natural land or veld, stock- or auction pens and at most two residential houses and other buildings, and it includes workers dwellings for bona fide labourers, which are reasonably connected with the main agricultural activity on the farm.'

2.2.1 CENTRAL ASTRONOMY ADVANTAGE AREA OVERLAY ZONE

As described in Chapter 3 of this report, three Central Astronomy Advantage Areas were declared by the Minister of Science and Technology in terms of Notice 141 of 2014, published in Government Gazette No. 37397 on 28 February 2014.

The aim of this Central Astronomy Advantage Areas is to control and prevent activities that may cause light pollution or radio frequency interference that may affect astronomy and related scientific endeavours within declared Core Astronomy Areas.

The Kareeberg and Karoo Hoogland local municipalities have therefore prepared a Central Astronomy Advantage Area Overlay Zone, the purpose of which is to restrict certain activities and for which the permission from the Astronomy Advantage Area Management Authority is required. The activities, as it relates to the SKA1_MID project, are as follows:

- *Prospecting or mining activities;*
- *The construction, expansion or operation of any fixed radio frequency interference sources;*
- *The construction or expansion of road or rail transport networks or parts thereof;*
- *The operation, construction or expansion of facilities for the generation, transmission or distribution of electricity;*
- *Activities capable of causing radio frequency interference, including bringing into the area or operating any interference source, mobile radio frequency interference source or short-range device.*

As evident from the above, the construction of the additional 21 radio telescope dish-antennas and associated infrastructure is not accommodated under the definition of 'agriculture', hence, the need for this rezoning application.

2.3 EXISTING INFRASTRUCTURE

The SKA project comprises of a host of radio telescope arrays, research facilities and supporting infrastructure. At its core is the MeerKAT, a 64-dish radio telescope array, which was built to

demonstrate South Africa's ability to host the SKA project. The properties upon which the MeerKat was constructed is referred to as the "core site".

Also included on the core site is the KAT-7, a compact radio telescope of which all of its antennas lie within an area only 200 metres within the core site.



Figure 4: MeerKAT.



Figure 5: KAT-7.

The Hydrogen Epoch of Reionization Array ("HERA") is an international science and technology collaboration to build a telescope array to advance our understanding of the early galaxy, specifically the birth of the first galaxies and black holes. It consists of 331 antennas of 14m in diameter. The HERA was granted the status of SKA precursor telescope by the SKAO in July 2017, joining the three other SKA precursor telescopes located on the SKA sites in Australia and South Africa⁴.



Figure 6: HERA.

Also included on the core site is the SKA Site Complex. This facility is a National Key Point and consists of:

- Dish-assembly shed: comprising the main working area where the SKA dish-antennas are assembled;
- Pedestal-assembly shed: a 274m² working area where all antenna components are integrated and includes offices, a store room and ablution facilities and a uncovered concrete slab for integration of the sub reflector with the dish support structure and initial alignment of the dish;
- Karoo Array Processor Building (KAPB) and power facility: constructed in a 5m underground bunker to limited radio-frequency. The KAPB currently houses the centralised telescope equipment for the MeerKAT while the power facility distributes power to the SKA site complex, the KAT 7, the MeerKAT and the HERA;
- Chemical storeroom: accommodates 200 litre drums that are double stacked and designed in terms of the requirements of the fire-safety by-laws and regulations for the storage of chemicals;
- Diesel storage area: three diesel tanks installed above ground to be used to generate electricity in the event of loss of power from Eskom;
- Sewage and wastewater treatment plant; and
- Carport and temporary on-site accommodation.

⁴ DeBoer, D., Bowman, J.D., Jacobs, D., Parsons, A., Liu, A., Werthimer, D., Ali, Z., Carilli, C.L., Chiang, C., Sievers, J.L., Furlanetto, S.R., Hewitt, J.N., Tegmark, M., Dillon, J.S., Bradley, R.F., Moore, D., Aguirre, J.E., Bernardi, G., Walbrugh, W., Morales, M.F., Pober, J., 2014: HERA: Chasing Our Cosmic Dawn, Bulletin of the American Astronomical Society, 46 (3) in IEPM.

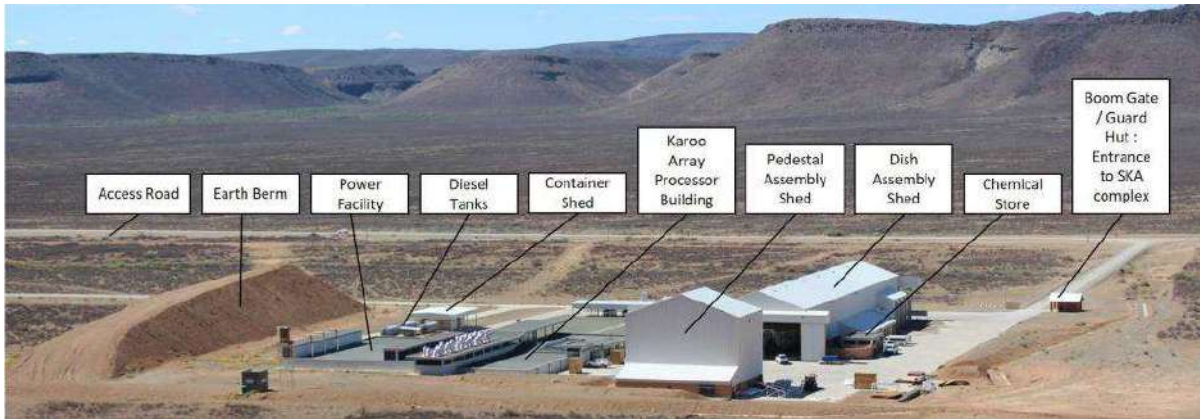


Figure 7: SKA Site Complex.

2.3.1 GRID POWER NETWORK

The existing grid power is supplied by the Eskom Karoo Substation located in Carnarvon via an overhead 33 kV line with a capacity of 4.5 Mega Volt Amp. A voltage regulator, regulating the power at 33 kV is located at the base camp located on the Remainder Farm Number 527 (common referred to as "Klerfontein").

From Klerfontein the line runs for approximately 25 km to the second voltage regulator, where power is stepped up by a constant percentage ensuring a supply of 33 kV and minimising radio frequency interference. Once the line passes through the second voltage regulator it runs to the existing construction camps as well as the SKA site complex.

A power drop-off from the main 33 Kv line at the boundary fence of the Remainder of farm Swartfontein No. 496 will provide power to the Hifax guest instrument, the farmhouses at Swartfontein and Portion 1 of the Remainder of the farm Swartfontein No. 496 ("Bergsig"), the Security Guard hut to be placed on the road to implement access control and the construction camp to be established on Visserskloof.

It is to be noted that small solar photovoltaic plants ("PV") will be established throughout the Spiral Arms. The purpose of the same is to provide additional electricity to the dish-antennas to prevent damages to said infrastructure due to possible load shedding events.

2.3.2 LANDING STRIP

The 1 300m long and 18m wide SKA landing strip with a taxiway connecting a 35m x 60m apron is located on Farm Mey's Dam No. 68 (Kareeberg Municipality) within the core site. The landing strip constitutes an "aerodrome" as defined in the Civil Aviation Act 13 of 2009 and was designed to accommodate a Pilatus PC- 12 (design aircraft) or similar.

2.4 CURRENT LAND-USE

The project site displays characteristics of a typical Nama Karoo landscape – large, flat to undulating plains with occasional sandstone and doleritic mountains and water courses that flow only in response to summer rain storms in what was a sparsely populated area (mainly farmsteads).



Figure 8: Bushmanland Vloëre (top left); Quiver Tree Forest (top right); dolerite boulders and rounded inselbergs generally occurring in the centre of the project site (bottom left and bottom right) (Source: Gaea Enviro Pty Ltd, 2018).

The vegetation encountered generally falls within the Nama-Karoo biome, which is characterised by low shrub land and grasses and underlain, as a whole, by a wide variety of Karoo Supergroup geology as well as more recent deposits. A pocket of wetlands featuring Bushmanland Vloëre forming part of the Azonal Vegetation Biome is located in the north-eastern corner of the project site.

The project site is characterised by an arid climate and receives on average less than 200mm annual rainfall. The mean annual rainfall at Fraserburg is 182mm, at Brandvlei 127mm, and Carnarvon 209mm. During 2019, the larger Karoo area was severely affected by a drought cycle which was considered by some as the worst in 100 years with some farmers in the Northern Cape only having about 30% of their core herd's remaining⁵

The project site is, historically, dominated by sheep farming with the climate, vegetation and large tracts of grazing land ideally suited for this use. The respective land units all share similar characteristics with farms dedicated to sheep farming and limited farm infrastructure, mostly concentrated at a single farm 'werf' which comprise of farmsteads, labourers cottages, farm sheds, general infrastructure and rounding pens. In instances where farms have access to rivers or boreholes for water abstraction, limited irrigated fields are also present.

⁵ Drought is killing SA's farmers – city [press - <https://city-press.news24.com/Business/drought-is-killing-sas-farmers-20191115> Riana de Lange 2019-11-1

SECTION C: APPLICATION CONTEXT

3 HISTORY OF THE APPLICATION PROCESS

This application follows on a comprehensive legislative and environmental process which resulted in amongst others the declaration of Astronomy Advantage Areas, issuing of a number of Environmental Authorizations (refer to paragraph 3.2.1 below), water and waste management licenses and mining permits for the construction of MeerKAT (refer to paragraphs 3.2.2 and 3.2.4 below and Annexures 6.4.1 and 6.4.2).

A Strategic Environmental Assessment (SEA) was undertaken by the CSIR over a period of nearly 4 years. The outcomes of the SEA culminated in the drafting and adoption of the Integrated Environmental Management Plan ("IEMP") as the environmental instrument for the construction of the SKA1_MID.

In terms of section 24(2)(e) of NEMA the Minister of Environmental Affairs excluded the NRF from the requirement to obtain an environmental authorization (refer to paragraph 4 below and Annexure 6.1) (Due to the sheer volume of the IEMP same has not been included herewith but is available on the NRF's website and on request). The Minister of Mineral Resources & Energy has also granted an exemption to the NRF from applying for mineral permits/licenses for SKA stone quarries and borrow pits (refer to paragraph 7 below and Annexure 6.4.2).

3.1 DECLARATION OF ASTRONOMY ADVANTAGE AREAS

To protect astronomy in all its forms in South Africa, it was necessary to pass legislation that, amongst others, identify and protect areas in which astronomy projects can be undertaken and regulate activities that cause or could cause interference. The Astronomy Geographic Advantage Act 21 of 2007 (the "AGA Act") was thus adopted as a comprehensive long-term instrument and together with its associated regulations provides for a wide range of requirements for the advancement and protection of astronomy in South Africa, in particular, although not limited to, the project site.

The AGA envisages a national system of Astronomy Advantage Areas ("AAA") which is highly suitable for astronomy and to date the following AAAs have been declared:

- the Northern Cape Province excluding Sol Plaatje Municipality;
- the Karoo Core AAA; and
- the Karoo Central AAAs.

3.1.1 KAROO CORE ASTRONOMY ADVANTAGE AREA

The 13 406 hectares Karoo Core AAA was declared in 2010⁶ for purposes of astronomy and related scientific endeavours. It hosts the KAT-7, MeerKAT and HERA radio telescopes which were declared for purposes of radio astronomy and related scientific endeavours.

The Karoo Core AAA is subject to regulations prohibiting any activities listed in section 23(1) of the AGA Act relevant to radio astronomy unless it is required for radio astronomy purposes⁷. The AAA is under a co-management agreement between the Astronomy Management Authority and the NRF and access to the area is restricted in terms of section 20 of the AGA Act.

⁶ Declared in terms of section 7 of the AGA Act on 20 August 2010.

⁷ Regulation R465 published on 22 June 2012.

3.1.2 KAROO CENTRAL ASTRONOMY ADVANTAGE AREAS

Three Karoo Central AAAs were declared in 2014 for radio astronomy and related scientific endeavours:

- Karoo Central AAA 1, approximately 123 456 square kilometres (km²),
- Karoo Central AAA 2, approximately 79 963 km² and
- Karoo Central AAA 3, approximately 44 602 km².

The Karoo Central AAA 1 is the largest of the Karoo Central AAA and includes four District Municipalities: Namakwa District Municipality, Pixley Ka Seme District Municipality, Siyanda District Municipality, and Central Karoo District Municipality.

The Karoo Central AAA regulations published in Regulation R465 on 22 June 2012 to protect the AAA prescribe specific protection measures for the use of the radio frequency spectrum and standards and conditions that must be complied with in conducting activities declared in terms of subsections 23(1) (b), (i) and (k) of the AGA Act.

The project site is located within the Karoo Central AAAs. The land use and associated activities which can be accommodated on the project site is thus astronomy related but also include activities related to environmental and heritage research and conservation.

3.2 INITIAL APPROVALS OBTAINED

3.2.1 ENVIRONMENTAL APPROVALS IN RESPECT OF MEERKAT CONSTRUCTION

Between 2007 and 2012 three Environmental Authorisations ("EA") and one Amendment were issued for the construction and operation of the MeerKAT and associated activities.

Table 4: Environmental approvals obtained in respect of the construction and operation of the MeerKAT.

APPROVAL REFERENCE NO.	DATE	ACTIVITIES AUTHORISED	PROPERTY
EA: NAT/NC/PS/CAR1/06/06 Permit 25/2007	30 May 2007	GN 387: Activities 12, 1, 15, 16 GN 387: Activity 2	RE & Ptn 1 Farm Losberg No. 73; Farm Mey's Dam No. 68; Farm Blouputs; RE Farm Rooizand No. 72; Ptn 1 Farm Brak Puts No. 66
EA: NC/PIX/MEER1/2008 Permit 72/2008	7 October 2008	GN 386: Activity 14, 15, 16	REM & Ptn 1 Farm Losberg No. 73; Farm Mey's Dam No. 68
EA: NC/PIX/KAR/TEL3/20/2008 Permit 41/2009	6 July 2009	GN 387: Amendment iro Activity 2	REM & Ptn 1 Farm Losberg No. 73; Farm Mey's Dam No. 68
EA: NC/PIX/KAR/TEL3/20/2008 Amendment to Permit 41/2009	10 February 2012	GN R386: Activities 7, 12, 13, 14, 15, 16(b), 17 GN R387: Activity 2	REM & Ptn 1 Farm Losberg No. 73; Farm Mey's Dam No. 68

3.2.2 WATER LICENCES

Water use licences were issued to the NRF on 29 August 2012 granting approval for extracting water from boreholes for a period of 20 years for use during the construction and operational phases of MeerKAT. The NRF has also obtained further water use licences for the Visserskloof Construction Camp and the SKA Core site in compliance with regulatory requirements of the National Water Act 36 of 1998. These licences were granted on 24 January 2022 and 12 May 2020, respectively.

The licences authorize the NRF to abstract water from boreholes for domestic water supply for the construction and operation of research telescopes near drainage lines, streams and existing roads. It also entails the abstraction of groundwater from boreholes for the Visserskloof construction camp to support the construction of the SKA1_MID project.

In addition to the above, the NRF has submitted two further applications to the Department of Water and Sanitation for the registration of a water use in terms of Section 39 of the National Water Act 36 of 1998 for the proposed infrastructure in the spiral arms. On 5 May 2023 and 19 July 2023, respectively, the Department of Water and Sanitation confirmed that the intended water use falls within the ambit of the General Authorization. As a result, the applicant is permitted to continue with the water uses as permissible in terms of Section 22 (1) (a) (iii) of the NWA.

The registered water uses, registration Certificates and a copy of the General Authorization is included herewith under Annexure 6.2.

3.2.3 WASTE MANAGEMENT LICENCES

The NRF is the holder of two waste management licences (Licence number 12/9/11/L817/8, class H:H and Licence number 12/9/11/L758/8, class H:H respectively) granted in terms of section 49 of the National Environmental Management: Waste Act 59 of 2008 ("NEMWA") on 27 March 2012 for the wastewater treatment works on the Remainder and Portion 1 of Farm Losberg No. 73 and Farm Mey's Dam No. 68. Refer to Annexure 6.3 for copies of the issued licenses.

The waste management licences are valid for a period of 20 years and permit the following waste management activities as listed in Category A of the list of waste management activities that have, or are likely to have, a detrimental effect on the environment (Government Notice 718 dated 3 July 2009):

- Category A – Activity (11): the treatment of effluent, wastewater or sewage with an annual throughput capacity of more than 2 000 cubic metres but less than 15 000 m³; and
- Category A – Activity (18): the construction of facilities associated with Activity (11).

Further water use licences were granted to the NRF by the Department of Water Affairs on 29 August 2012 for a period of 20 years authorising water usage associated with the disposing of waste in terms of section 21(g) of the National Water Act:

- License No: 14/D54E/A/1911: granted for the disposal of 7 200 m³ of wastewater per annum into an evaporation dam on the Remainder and Portion 1 of Farm Losberg No. 73; and
- License No: 14/D54E/ACGI/1012: granted for the disposal of 2 880 m³ of wastewater per annum into an evaporation dam on Farm Mey's Dam No. 68.

3.2.4 MINING PERMITS

There are currently four licenced borrow pits, for which Mining Permits were issued, near the core site. These borrow pits were used to supply gravel material for the MeerKAT project but are currently not mined for gravel.

The following mining permits are associated with the existing borrow pits that were used for the MeerKAT (refer to Annexure 6.4.1):

- Mining Permits No. MP19/2012, No. MP20/2012, and No. MP21/2012: granted in respect of mining activities on Farm Mey's Dam No. 68;
- Mining Permits No. MP29/2012, No. MP18/2012, No. MP24/2012, No. MP17/2012, No. MP23/2012, and No. MP28/2012: granted in respect for borrow pits on Farm Mey's Dam No. 68;
- Mining Permit No. MP16/2012: granted in respect a borrow pit on Erf 353; and
- Mining Permit No. MP22/2012: granted in respect a stone quarry on Farm Saaifontein.

It is noted that the NRF obtained an exemption from the provisions of Sections 16, 20, 22 and 27 of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) ("MPRDA") in respect of any activity to remove any mineral within the NRF's area of jurisdiction for the construction and maintenance of roads and infrastructure incidental to the SKA_MID (Exemption attached hereto as Annexure 6.4.2).

It is the intention to use the existing licenced borrow pits in the SKA land core area to its maximum potential before creating any new borrow pits to reduce the disturbance of land.

3.2.5 REZONING APPROVALS

Application was made in terms of Section 8 of the former Land Use Planning Ordinance 15 of 1985 (hereinafter referred to as "LUPO Scheme 8 Regulations") read together with the Northern Cape Planning and Development Act 7 of 1998 ("NCPDA") to the Kareeberg Municipality for the rezoning of Farm Mey's Dam Number 68 from Agriculture Zone 1 to Special Zone to allow for the construction of a radio telescope and related infrastructure.

A similar application was made in terms of Section 44(2) of the NCPDA read with the Municipal Manual and Procedure for Land Use Management 2005 to the Karoo Hoogland Municipality for rezoning of the Remainder and Portion 1 of Farm Losberg No. 73 from Agriculture Zone 1 to Special Zone.

A joint application was submitted to both municipalities by WM de Kock Associates and Delia Power Town Planning Services with approval granted by Kareeberg Municipality (Ref No. 15.1.R) on 15 February 2012 and Karoo Hoogland Municipality (Ref No. 16.8.1.1) on 16 October 2012 (rezoning approvals attached as Annexures 5.1 and 5.2).

Further to the above, an application was made during 2020, in terms of Section 3(2)(b) and 3(2)(i) of the Karoo Hoogland Municipal Planning By-Law, 2015 read together with the Karoo Hoogland Scheme Regulations, 2005 and the Spatial Planning and Land Use Management Act 16 of 2013 for the rezoning of 12 farms comprising the SKA Land Core site from Agriculture Zone 1 to Special Zone for purposes of establishing the first stage of the SKA1_MID facility and from Agriculture Zone 1 to Open Space Zone III in support of the declared Meerkat National Park.

Similarly, application was also made in terms of Section 3(2)(b) and 3(2)(i) of the Kareeberg Municipal Planning By-Law read together with the Kareeberg Municipal Zoning Scheme (2009) and the Spatial Planning and Land Use Management Act 16 of 2013 for the rezoning of 25 farms comprising the SKA Land Core site from Agriculture Zone 1 to Special Zone for purposes of establishing the first stage of the SKA1_MID facility and from Agriculture Zone 1 to Open Space Zone III in support of the declared Meerkat National Park.

A joint application was submitted to both municipalities by Werksmans Attorneys with approval granted by Kareeberg Municipal (Ref No. 15.1.R) on 5 May 2021 and Karoo Hoogland Municipality (Ref No. 16.8.1.1) on 28 April 2021 (rezoning approvals attached as Annexures 5.3 and 5.4).

4 EXCLUSION FROM THE REQUIREMENT TO OBTAIN ENVIRONMENTAL AUTHORISATION

The National Environmental Management Act 107 of 1998 creates the fundamental legal framework that ensures the legislative concretisation of the environmental rights guaranteed in section 24 of the Constitution of the Republic of South Africa, 1996.

The Act sets out fundamental principles that apply to the actions of all organs of state that may significantly affect the environment. In order to give effect to the general objectives of integrated environmental management laid down in NEMA, the Act requires that the potential consequences for or impacts on the environment of listed activities or specified activities must be considered, investigated, assessed and reported on, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of this Act.

The identification of the SKA and MeerKAT as one of eighteen Strategic Integrated Projects ("SIPs") (refer to paragraph 11) which are large scale infrastructure projects of national importance aimed at unlocking the development potential in the country compelled the Department of Environmental Affairs to undertake Strategic Environmental Assessments ("SEAs") to integrate the regulatory environmental requirements for undertaking the SIPs.

4.1 STRATEGIC ENVIRONMENTAL ASSESSMENT

The Department of Environmental Affairs subsequently appointed the Council for Scientific and Industrial Research (CSIR) to undertake a SEA for Strategic Integrated Project 16: SKA1_MID.

According to the CSIR the mission of the SEA was "to provide a platform to coordinate research and data collection within the proposed development area of SKA1_MID and integrate the environmental authorisation process ensuring that environmental factors are adequately considered and environmental principles implemented at the strategic planning stage"⁸.

The findings and outputs of the SEA were compiled into two reports:

- an **Integrated Environmental Management Plan ("IEMP")** which established the minimum requirements for the construction and operation phases of SKA1_MID, environmental principles, environmental monitoring and control activities as well as long-term research monitoring programmes to be implemented on the project site; and
- a **Strategic Environmental Assessment Report ("SEA Report")** (available on request)

⁸ CSIR, 2016. Strategic Environmental Assessment for the South African mid-frequency array of SKA Phase 1. CSIR Report Number: CSIR/02100/EMS/ER/2016/15240/B

which included details about the analysis, timeline and activities, stakeholder engagement, and specialist studies undertaken during the Strategic Environmental Assessment process.

On 22 March 2019, by Government Notice No 436 published in Government Gazette 42323, the Minister of Environmental Affairs in terms of section 24(2)(e) of the NEMA excluded the NRF from the requirement to obtain an environmental authorisation for any listed activities by adopting the IEMP as environmental management instrument (Notice of Adoption attached as Annexure 6.1).

The project proposals, with specific reference to the design and placement of the SKA1_MID infrastructure, that led to this land use planning application, was prepared in accordance with the principles of NEMA and the concept of integrated environmental management.

4.1.1 STATE OF THE ENVIRONMENT

The environmental process that had been undertaken as part of the SEA included a thorough assessment of the state of the environment within which the project site is located. The aspects addressed and the respective consultants were as follows:

Table 5: List of detailed specialist assessments.

STUDY ASPECT	SPECIALIST CONSULTANT
Terrestrial Ecology & Biodiversity Assessment	Dr Sue Milton (<i>RENU-KAROO Veld Restoration cc</i>)
Freshwater Aquatic Ecosystems Assessment	Kate Snaddon; Deann Ollis & Tumisho Ngobela (<i>Freshwater Research Centre</i>)
Fine-Scale Habitat Mapping & Baseline of SKA Land Core Area	Simon Todd (<i>SAEON Arid Lands Node</i>)
Endangered Species Survey	Bonnie Schumann & Esté Matthew (<i>Endangered Wildlife Trust</i>)
Bat Fauna Sensitivity Study	Kate MacEwan (<i>Inkululeko Wildlife Services</i>)
Avifauna Sensitivity Study	Dr Richard Dean (<i>DST/NRF at UCTs Centre of Excellence at Percy FitzPatrick Institute of African Ornithology</i>)
Heritage Assessment (Incl Archaeology, Palaeontology, Cultural Heritage & Landscape)	Kyla Bluff, Nicholas Wiltshire & Jenna Lavin (<i>Cedar Tower Services</i>) Jayson Orton (<i>ASHA Consulting</i>) John Almond (<i>NaturaViva</i>) Bernard Oberholzer (<i>BOLA Landscape Architect</i>) Quinton Lawson (<i>MLB Architects</i>)
Soils, Erosion & Agricultural Potential Assessment	Johann Lanz
Agricultural Economics Study	Prof Johann Kirsten (<i>Bureau for Economic Research: University of Stellenbosch</i>)
Review of Existing Socio-Economic Surveys	Prof Doreen Atkinson (<i>C2 National Research Foundation</i>)
Socio-Economic Assessment	Prof Doreen Atkinson (<i>C2 National Research Foundation</i>) Rae Wolpe (<i>Impact Economix</i>) Adv Hendrik Kotze (<i>University of Stellenbosch Business School</i>)

Screening Major Hazard Installation Risk
Assessment

Michael Paul Oberholzer (*RISCOM Pty Ltd*)

Table 6 below lists additional technical studies undertaken by the NRF to inform the design of SKA1_MID.

Table 6: Additional Technical Studies.

STUDY ASPECT	SPECIALIST CONSULTANT
Geotechnical Field Assessment	Kobus Troskie (GCS (Pty) Ltd)
Hydrogeological Field Assessment	Kobus Troskie (GCS (Pty) Ltd)
Heritage Field Assessment	Justin du Piesanie (Digby Wells)
Ecological and Aquatic Field Assessment	Joh Henschel (SAEON Arid Lands Node)

4.2 FINDINGS OF THE ASSESSMENTS

The SEA process included intensive iterations with the specialist consultants which *inter alia* led to the detailed identification and surveying of no-go areas and subsequent adjustment of the design so as to ensure that the potential detrimental impact of the final proposal is limited to an acceptable level and that the potential positive impact thereof is optimised. These areas include habitats that are essential for the survival of rare plant or animal species and practically impossible to restore once they have been destroyed.

The areas not suitable for development and which subsequently informed the design and placement of the proposed infrastructure are reflected on Figures 9 to 11 below.

These areas include:

- mudstone/ sandstone rock sheets: these features are home to rare succulents and reptiles;
- large dolerite hills: these features cannot be restored once destroyed by blasting, trenching or road building;
- cluster of *Aloidendron dichotomum* (formerly *Aloe dichotoma* / common names: quiver tree or kokerboom): rated as Vulnerable in the 2014 Red List of South African Plants and not threatened under the National Environmental Management: Biodiversity Act 10 of 2004;
- pans and wetlands: development may change drainage patterns and affect the wildlife especially birds, amphibians and fish that use the pans after rain;
- red sand-dunes: habitat of the narrow range endemic and substrate-restricted Red Lark;
- depressional wetlands, seep wetlands and pans;
- wetland flats;
- watercourses;
- Grade II heritage sites of high provincial or regional significance including corbelled buildings declared Provincial Heritage Sites on the farms Grootfontein, Arbeidsfontein and Stuurmansfontein (no impacts anticipated), and culturally significant places not formally protected on Groot Pardekloof;
- Grade IIIa heritage features including burial grounds, rock paintings, historical buildings, stone age artefacts and monuments: high local significance heritage resources worthy of conservation.

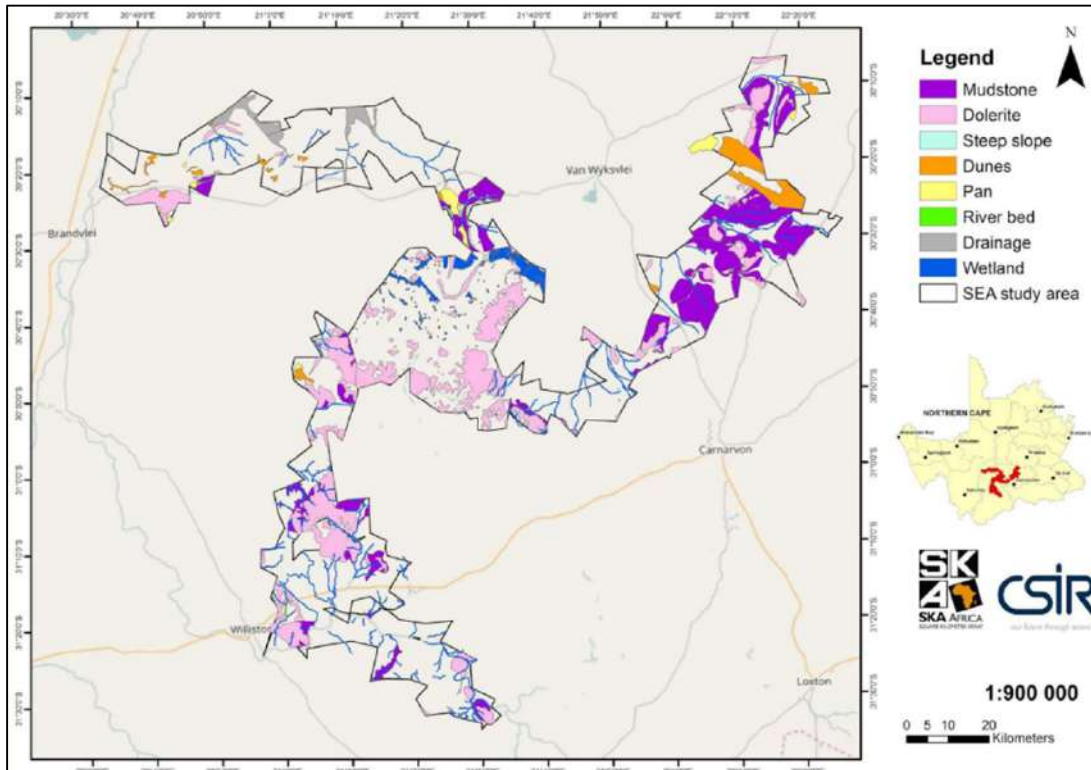


Figure 9: Very High sensitivity terrestrial ecology and biodiversity features.

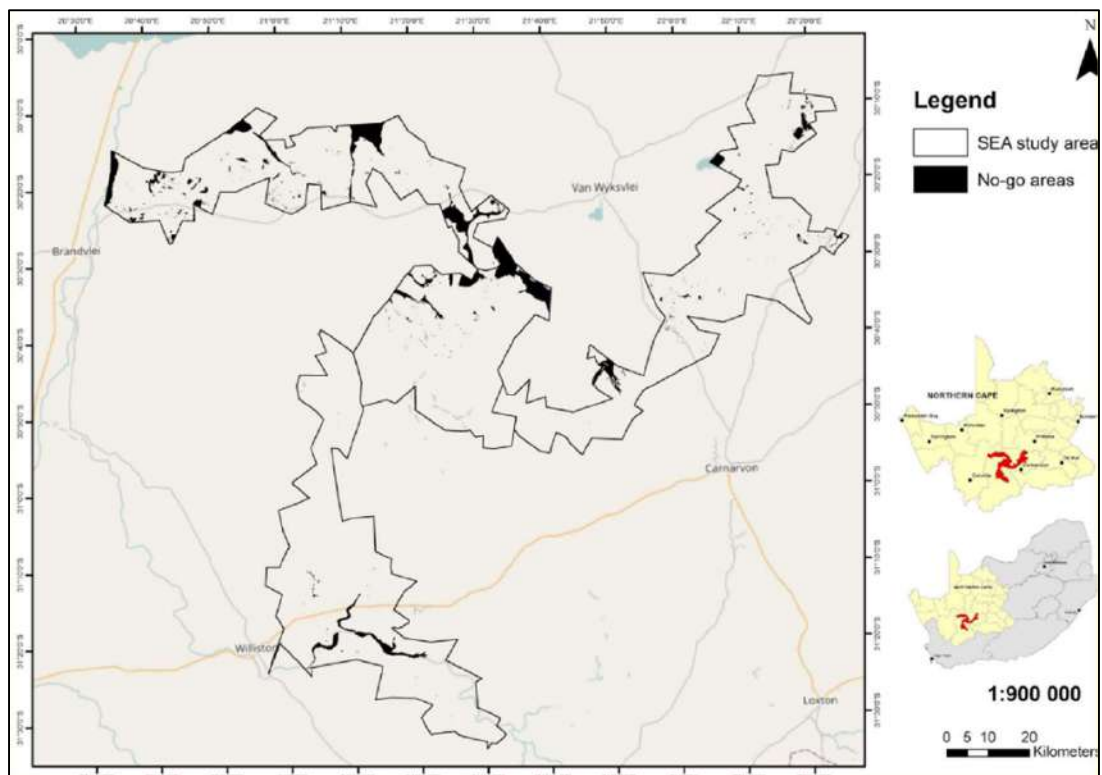


Figure 10: Very high sensitivity aquatic ecosystem features.

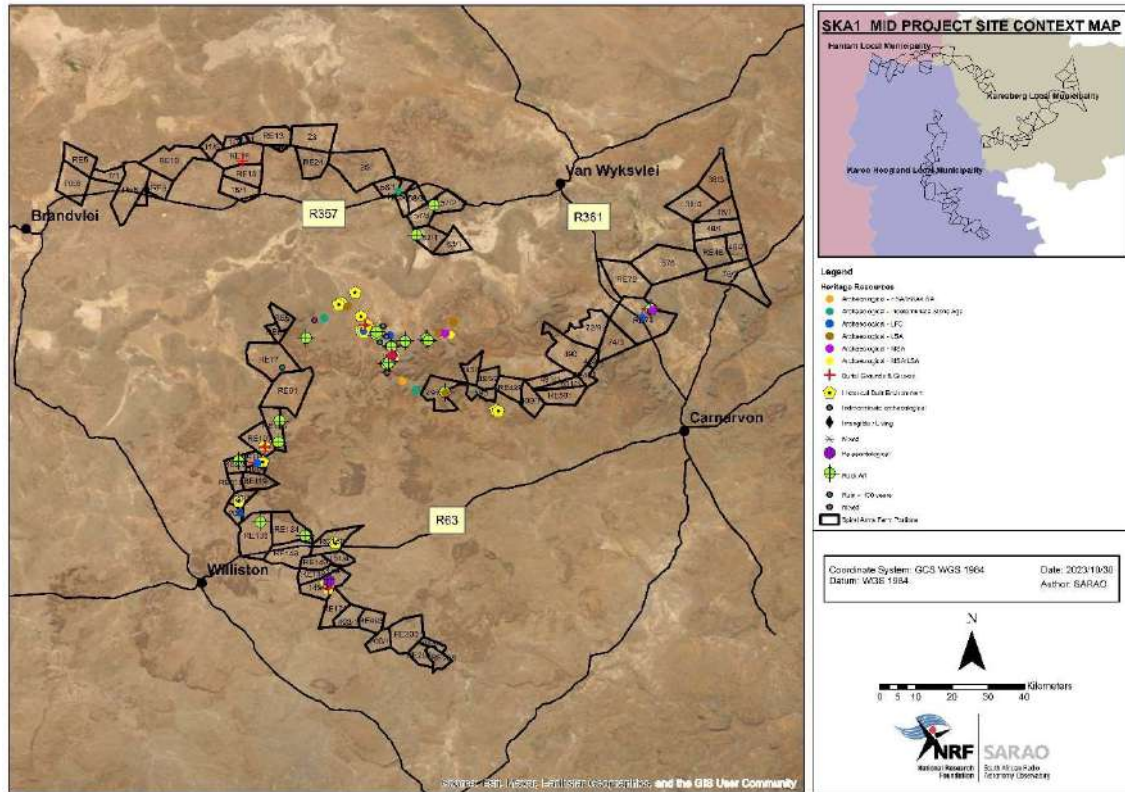


Figure 11: Heritage resources within the project site.

The NRF undertook to avoid, as far as practically possible, other sensitive environmental resources identified by the SEA process within the project site and mitigate any possible impacts as per the Environmental Management Programme approved as part the Notice of Adoption of the IEMP (refer to paragraph 4.1 above). These sensitive features include:

- populations of *Acacia erioloba* and *Hoodia* spp,
- protected and listed faunal species³;
- floodplain wetlands (river beds);
- valley bottom wetlands;
- river reaches;
- major drainage lines;
- riparian zones;
- ridges and high lying areas;
- prominent and quartz outcrops and dolerite gravel plains; and
- Grade IIIb & IIIc rock art sites.

All recommendations, impact management actions and impact management outcomes prescribed by the specialists were included in the Environmental Management Programme of the IEMP which recommendations and conditions must be complied with.

4.3 ENVIRONMENTAL CONSTRUCTION AUDITS

As mentioned above, the IEMP established the minimum requirements for the construction and operation phases of SKA1_MID, environmental principles, environmental monitoring and control activities as well as long- term research monitoring programmes to be implemented.

As such, it is required that an annual construction audit report be compiled and submitted to the DFFE for approval. The purpose of the audit report is to verify compliance against the pre-construction and construction phase of the IEMP for the audit period.

The notification to commence with construction was submitted to the DFFE on 31 August 2021 whilst construction of the SKA1_MID project formally commenced on 14 September 2021. Two audit reports have therefore already been prepared and submitted to the DFFE.

The audit report for the last reporting period (i.e. September 2022 – September 2023) commented on the following:

- Areas of good compliance;
- Environmental incidents;
- Non-conformances;
- Reportable incidents as per NEMA and the NWA;
- Social engagement;
- Protected vegetation;
- Waste management;
- Rehabilitation;
- Environmental performance; and
- Recommendations for IEMP amendments.

In conclusion, an overall environmental compliance score of 95% was achieved for the annual reporting period. The report note that this score was due to some of the requirements not being addressed before construction commenced. The report also finds that most of the previous findings that were made in the first annual audit report was addressed with just a few minor incidents remaining open.

5 RECORD OF DECISION – NATIONAL HERITAGE RESOURCES ACT 25 OF 1999

The National Heritage Resources Act 25 of 1999 ("NHRA") is the overarching legislation that protects and regulates the management of heritage resources in South Africa. The Act requires that Heritage Resources Authorities, in this case the South African Heritage Resources Agency ("SAHRA") and Northern Cape – Provincial Heritage Resources Agency (Ngwao Boswa jwa Kapa Bokone or hereinafter referred to as "Heritage NC"), be notified as early as possible of any developments that may exceed certain minimum thresholds in terms of Section 38(1), or when assessments of impacts on heritage resources are required by other legislation in terms of Section 38(8) of the Act.

The SEA process summarised above included a strategic level assessment of the heritage resources of the project site. To comply with Section 38 of NHRA this assessment report was submitted to the SAHRA and Heritage NC. As part of its final comment SAHRA requested a Heritage Impact Assessment ("HIA") to be undertaken. Digby Wells Environmental (Pty) Ltd. was subsequently appointed to undertake a HIA and compile a Conservation Management Plan ("CMP").

Digby Wells concluded that the proposed project occurs within a sensitive cultural landscape and thus made several recommendations to manage or mitigate the identified possible impacts. They however recommended that the proposed project could proceed, subject to the NRF taking into

consideration its findings.

After proper consideration, the SAHRA issued comments on 7 September 2018 (Case ID 12292) thereby endorsing the project and recommendations of the specialists as per the HIA. Since the issuing of the comment, SAHRA issued a Final Decision on 24 January 2020 which addressed several amendments to the project design and a walk-down of the project components. The Final Decision is attached as Annexure 6.5.

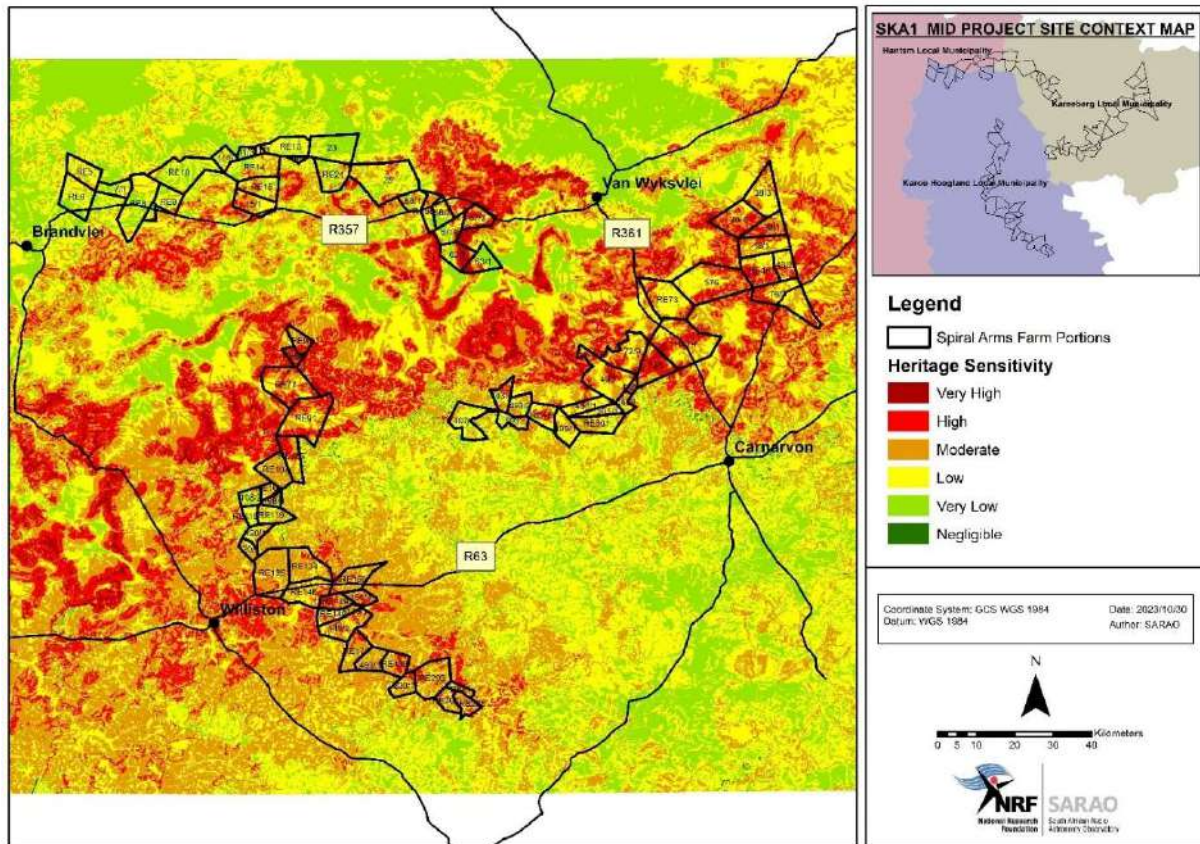


Figure 12: Heritage Sensitivity Map.

6 SUBDIVISION OF AGRICULTURAL LAND ACT 70 OF 1970

As stated above the project site is currently zoned for agricultural purposes and used as such, thus subject to the Subdivision of Agricultural Land Act 70 of 1970 ("SALA").

SALA restricts the subdivision of agricultural land and prohibits certain activities to be undertaken on agricultural land except with the permission of the Minister of Agriculture and Land Reform. The construction of the proposed SKA1_MID infrastructure in the spiral arms entails a "development area" to be established on land which is agricultural land as contemplated in section 3(f) of SALA, a restricted activity requiring written consent of the Minister.

Section 2(a) of SALA sets out the following "Actions which are excluded from the application of the Act":

- (i) any subdivision of land for the purpose of transferring a portion thereof to the State or a statutory body;
- (ii) the transfer of an undivided share in land to the State or a statutory body;

(iii) **the sale or grant of any right to any portion of agricultural land to the State or a statutory body.**

Consequently, SALA is not applicable to the SKA1_MID spiral arms and the consent of the Minister in terms of SALA is not required. A Memorandum of Advice addressing the rezoning of the project site and the applicability of SALA is attached hereto as Annexure 7.

7 EXEMPTION IN TERMS OF MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT 28 OF 2002

The Mineral and Petroleum Resources Development Act 28 of 2002 ("MPRDA") regulates mineral resource management and exploitation. The Act further provides that where a person wishes to use the surface of any land where such use may be contrary to the objects of the Act or is likely to impede the objects of the Act approval from the Minister of Mineral Resources must be obtained. Therefore, in the event that there are any rights registered in respect of the project site under the MPRDA, the approval from the Minister of Mineral Resources must be obtained.

Although there are a number of mining permits and approvals in place as summarized in paragraph 3.2.4 the NRF obtained an exemption from the provisions of Sections 16, 20, 22 and 27 of the MPRDA in respect of any activity to remove any mineral within the NRF's area of jurisdiction for the construction and maintenance of roads and infrastructure incidental to the SKA_MID (Exemption attached hereto as Annexure 6.4.2).

SECTION D: APPLICATION DETAILS

8 LAND USE PLANNING APPLICATIONS AND ASSOCIATED ASPECTS

A joint application is made on behalf of the NRF and the respective landowners for consideration by the Kareeberg, Karoo Hoogland and Hantam Municipalities in respect of the rezoning of **certain portions of the project site** and the **registration of servitudes** to allow for the construction of the proposed SKA1_MID spiral arms consisting of dish-antennas, telescopes and associated infrastructure.

The motivation for the application was drawn from the SEA process which included comprehensive specialist studies which resulted in the gazetted IEMP, the purpose being to provide conclusive evidence regarding the need and desirability of the infrastructure project and long-term management thereof.

In order to enable the implementation of the proposed SKA1_MID the following key aspects will have to be considered.

8.1 REZONING

In order to make provision for the construction of the SKA_1 dish antennas and associated photovoltaic plants, summarised in Section E, application is herewith made to the Kareeberg and Karoo Hoogland Municipalities, respectively, for the rezoning of certain portions of the project site from **Agriculture Zone** to **Extended Astronomy Zone**.

Similarly, application is herewith also made to the Hantam Municipality for the rezoning of certain portions of the project site from **Agriculture Zone I** to **Utility Zone IV**, which provides for an 'extended astronomy zone'.

In all of the applicable Municipal Land Use Schemes an 'extended astronomy zone' allows for 'astronomy and related scientific endeavours' and 'astronomy apparatus' as a primary right. The latter uses are defined in the respective Land Use Schemes as follows:

'Astronomy and related scientific endeavours' (as defined in the Astronomy Geographic Advantage Act No. 21 of 2007) means:

- a) *The science involving the observation and explanation of events beyond the earth and its atmosphere, and includes optical astronomy, radio astronomy, gamma ray astronomy and cosmic ray astronomy;*
- b) *Observations that assist in understanding the sun and the magnetosphere;*
- c) *Deep space radio dishes, array networks for the management of space flight and the management of space flight and the management of strategic scientific deep-space missions; and*
- d) *Any other scientific endeavour declared as such by the Minister in terms of section 28 of the Astronomy Geographic Advantage Act No. 21 of 2007.*

'Astronomy apparatus' – means:

All astronomy instruments, devices and associated infrastructure needed to enable astronomy and related scientific endeavours, including:

- a) *optical instruments, including antennas, for collection and measurement of radiation, including electromagnetic near-ultraviolet, visible and infrared radiation, from astronomical sources;*
- b) *radio instruments and antennas for reception of radio waves of cosmic origin;*

- c) *all components, connections and electronic communications links thereof, whether such components, connections or electronic communications links are contiguous or not; and*
- d) *all associated infrastructure and structures directly linked to the operation and maintenance of the instruments, devices and components, including access roads, energy generation apparatus and structures.*

It is the intent of the Extended Astronomy Zone to provide for the establishment, management and operation of astronomy apparatus and associated services infrastructure to support the astronomy apparatus.

Table 7: Summary of proposed rezoning of the project site (refer to Figure 13 below).

COMPONENT	AREA	ZONING	LAND USE
Kareeberg Municipality	21 ha	Extended Astronomy Zone	20 dish-antennas
Karoo Hoogland Municipality	14 ha	Extended Astronomy Zone	19 Photovoltaic plant & associated infrastructure
Hantam Municipality	4 ha	Utility Zone IV	
TOTAL:	39 ha		

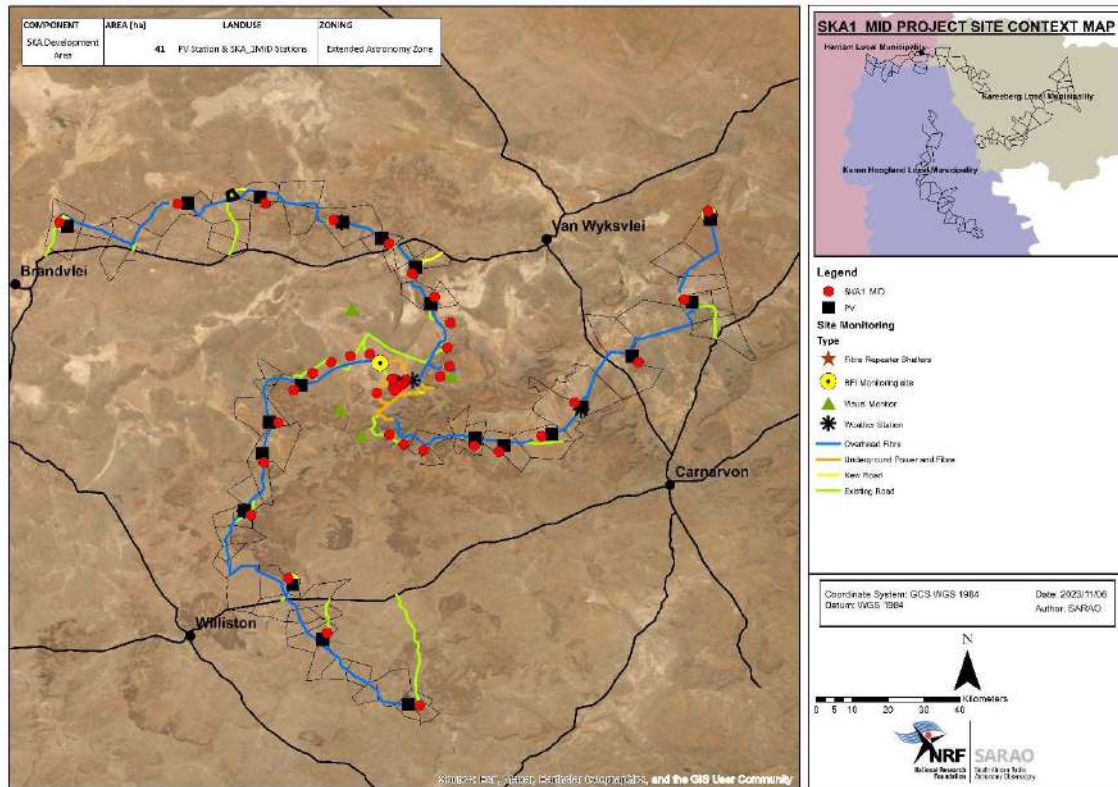


Figure 13: Composite Rezoning Plan for project site.

8.1.1 APPLICATION TO KAROO HOOGLAND MUNICIPALITY

Application is made in terms of Section 3(2)(b) and Section 3(2)(i) of the Karoo Hoogland Municipal Planning By-Law, 2015 read together with the Karoo Hoogland Land Use Scheme, 2022, for the rezoning (i.e. spot zoning) of portions of the project site from Agricultural Zone to **Extended Astronomy Zone** for the purpose of establishing SKA1 dish antennas and photovoltaic plants and associated infrastructure as part of the SKA1_MID facility.

The portions of the land units to be rezoned, the land uses to be implemented and servitudes to be registered on the respective properties are listed in Table 8 below (refer to paragraphs 11 to 14 read together with applicable Plans annexed as Annexure 1 and 8 for more detail description).

Table 8: Zoning and land uses applied for on the project site located in Karoo Hoogland Municipality.

LAND UNITS	PLAN NO	ZONING: EXTENDED ASTRONOMY ZONE	LAND USE
Remainder of the Farm Stemregt No. 68	Plan No 22		7 x SKA_1 dish-antennas 7 x Photovoltaic plants & associated infrastructure
Remainder of the Farm Die Tuin No. 493	Plan No 43		
Portion 1 (Wilda) of the Farm Die Tuin No. 493	Plan No 42		
The Farm Zand Puts No. 77	Plan No 23	2 ha	SERVITUDES 8 313m of new roads (8.3ha) 119 800m of existing roads to be upgraded (119.8ha) 166 451m new fibre lines (Overhead) (366.19ha) 21 422m new fibre & power lines (Underground) (10.71ha) 1 x Fibre repeater shelter (400m²) 2 x RFI Monitoring sites (50m²) 1 x Weather monitoring station (25m²)
The Farm Bissies en Anteel Kolk No. 91	Plan No 24	1 ha	
Remainder of the Farm Dassie Kloof No. 105	Plan No 25	1 ha	
Remainder of the Farm Oest No. 107	Plan No 26		
Remainder of the Farm Koega No. 108	Plan No 27	1 ha	
Portion 2 (Klipbank) of the Farm Koega No. 108	Plan No 30		
Remainder of Portion 3 of the Farm Koega No. 108	Plan No 29	1 ha	
Portion 4 (a portion of Portion 3) of the Farm Koega No. 108	Plan No 28		
Portion 1 (Uitkomst) of the Farm Friesland No. 200	Plan No 44		
Remainder of the Farm Bloem-Fontein No. 119	Plan No 32		
Remainder of the Farm Klip Drift No. 203	Plan No 45		
Remainder of Portion 1 (Vadersklip) of the Farm Korfsplaat) No. 204	Plan No 47		
The Farm Weltevrede No. 205	Plan No 48	1 ha	
Portion 1 (Jacobus Daal) of the Farm Bloem-Fontein No. 119	Plan No 31		
Remainder of Portion 1 (Browns Laage) of the Farm Vaalhoek No. 120	Plan No 33		
Portion 2 (a portion of Portion 1) of the Farm Vaal Hoek No. 120	Plan No 34		
The Farm Riet Kolk No. 6	Plan No 1	2 ha	
Remainder of Portion 1 (Vos Zyn Vlei) of the Farm Vos Zyn Vlei No. 7	Plan No 3		
The Farm Sunny Side No. 8	Plan No 4		
Remainder of the Farm Abiquas Puts No. 9	Plan No 5		
The Farm Leeuw Krantz No. 134	Plan No 36	2 ha	

Remainder of the Farm Ongeluksfontein No. 135	Plan No 35	
Remainder of the Farm Zakfontein No. 148	Plan No 37	
Remainder of the Farm Langbaken No. 149	Plan No 38	
Portion 2 of the Farm Langbaken No. 149	Plan No 40	2 ha
The Farm Tierkop No. 51	Plan No 21	
Remainder of the Farm Palmiet Fontein No. 171	Plan No 41	
Remainder of the Farm Korfsplaats No. 204	Plan No 46	1 ha
Remainder of the Farm Scheerkraal No. 5	Plan No 2	
TOTAL:		14 ha

8.1.2 APPLICATION TO KAREEBERG MUNICIPALITY

Application is hereby made in terms of Section 3(2)(i) of the Kareeberg Municipal Planning By-Law (2015) read together with the Kareeberg Municipal Land Use Scheme (2022), for the rezoning (i.e. spot zoning) of portions of the project site from Agricultural Zone to **Extended Astronomy Zone** for the purpose of establishing SKA1 dish antennas and photovoltaic plants and associated infrastructure as part of the SKA1_MID facility.

The portions of the land units to be rezoned and the land uses to be implemented and servitudes to be registered on the respective properties are listed in Table 9 below (refer to paragraphs 11 to 14 read together with applicable Plans annexed as Annexure 1 and 8 for more detail description).

Table 9: Zoning and land uses applied for on the project site located in Kareeberg Municipality.

LAND UNITS	PLAN NO	ZONING: EXTENDED ASTRONOMY ZONE	LAND USE
Remainder of the Farm Waterval No. 497	Plan No 49	1 ha	12 x SKA_1 dish-antennas 11 x Photovoltaic plants & associated infrastructure
Remainder of the Farm Paarde Vlei No. 73	Plan No 58		
Remainder of the Farm Garst Kolk No. 74	Plan No 57	2 ha	
The Remainder of the Farm Wolf Werf No. 23	Plan No 12		
The Farm Riet Kops Kolk No. 25	Plan No 13	2 ha	SERVITUDES 83 758m of new roads (83.8ha) 82 760m of existing roads to be upgraded (82.76ha) 164 621m new fibre lines
Portion 1 of the Farm Thomas Pan No. 38	Plan No 63		
Portion 4 (a portion of Portion 3) of the Farm Thomas Pan No. 38	Plan No 64		
Remainder of the Farm Bottel Put No. 48	Plan No 60	2 ha	
Portion 1 of the Farm Bottel Put No. 48	Plan No 62		
Portion 2 of the Farm Bottel Put No. 48	Plan No 61		
Portion 2 (Goei Hoop) of the Farm Groot Kolk No. 57	Plan No 18		

Portion 4 (Grootkolk) of the Farm Groot Kolk No. 57	Plan No 17	2 ha	(Overhead) (362.17ha) • 45 674m new fibre & power lines (Underground) (22.84ha) • 3 x Fibre repeater shelters (400m²) • 1 x RFI Monitoring site (25m²) • 2 x Weather monitoring stations (25m²)
Remainder of the Farm Moffys Dam No. 58	Plan No 15	1 ha	
Portion 1 of the Farm Moffys Dam No. 58	Plan No 14	1 ha	
Portion 3 of the Farm Moffys Dam No. 58	Plan No 16		
Portion 1 of the Farm Jagt Pan No. 62	Plan No 19		
Portion 1 of the Farm Vlak Leegte No. 491	Plan No 55	2 ha	
Portion 1 (Geluk) of the Farm Uitspan-Kolk No. 499	Plan No 54		
The Farm Bitterpoort No. 576	Plan No 59		
Remainder of Portion 3 of the Farm Thomas Pan No. 38	Plan No 65	2 ha	
Portion 1 (Dubbelde Vlei Noord) of the Farm Dubbelde Vlei No. 63	Plan No 20	2 ha	
The Farm Kareekloof No. 490	Plan No. 71	2 ha	
Portion 9 of the Farm Jagersberg No. 72	Plan No 56		
Remainder of the Farm Uitspan-Kolk No. 499	Plan No 53	2 ha	
Remainder Portion 2 (Bondeblaf Oos) of the Farm Honde Blaf No. 493	Plan No 51	1 ha	
Portion 3 (portion of Portion 1) of the Farm Honde Blaf No. 493	Plan No 50		
The Farm Jagterskloof No. 593	Plan No 52	1 ha	
TOTAL:		23 ha	

8.1.3 APPLICATION TO HANTAM MUNICIPALITY

Application is hereby made in terms of Section 15(2)(a) of the Standard Draft By-Law on Municipal Land Use Planning, prepared in terms of the Spatial Planning and Land Use Management Act, 16 of 2013 read together with the Hantam Land Use Scheme, 2021 for the rezoning (i.e. spot zoning) of portions of the project site from Agricultural Zone I to **Utility Zone IV** for the purpose of establishing SKA1 dish antennas and photovoltaic plants and associated infrastructure as part of the SKA1_MID facility.

The portions of the land units to be rezoned and the land uses to be implemented and servitudes to be registered on the respective properties are listed in Table 10 below (refer to paragraphs 11 to 14 read together with applicable Plans annexed as Annexure 1 and 8 for more detail description).

Table 10: Zoning and land uses applied for on the project site located in Hantam Municipality.

LAND UNITS	PLAN NO	ZONING: UTILITY ZONE IV	LAND USE
Remainder of the Farm Zout Poort No. 10	Plan No 6	2ha	• 2 x SKA_1 dish-antennas • 2 x Photovoltaic plants &

Portion 1 (Klipkoppies) of the Farm Jan Louws Leegte No. 11	Plan No 9		associated infrastructure
Portion 5 of the Farm Jan Louws Leegte No. 11	Plan No 7		SERVITUDES
Remainder of the Farm Kameel Boom Puts No. 13	Plan No 10	1 ha	29 837m of new roads (29.8ha) 11 809m of existing roads to be upgraded (11.81ha)
Portion 2 (a portion of Portion 1) of the Farm Jan Louw Kolk No. 14	Plan No 11	1 ha	38 271m new fibre lines (Overhead) (84.20ha)
Portion 3 of the Farm Jan Louws Leegte No. 11	Plan No 8		7 203m new fibre & power lines (Underground) (3.60ha)
TOTAL:		4 ha	

8.2 REGISTRATION OF SERVITUDES

In order to make provision for the construction and installation of supporting infrastructure, and in order to permit the NRF to operate the facilities on third-party landholdings, application is herewith made in terms of Section 3(2)(l) of the Kareeberg Municipal Planning By-Law read together with the Kareeberg Municipal Land Use Scheme (2022), as well as terms of Section 3(2)(l) of the Karoo Hoogland Municipal Planning By-Law, 2015 read together with the Karoo Hoogland Land Use Scheme, 2022 for registration of servitudes.

Similarly, application is herewith made in terms of Section 15(2)(d) of the Spatial Planning and Land Use Management Act, 16 of 2013 read together with the Hantam Land Use Scheme, 2021 for registration of servitudes.

The proposed servitudes are to make provision for the following land uses which is further described in Section E and listed in Tables 8, 9 and 10 above (refer to paragraphs 11 to 14 read together with applicable Plans annexed as Annexure 1 for more detail description):

- ±111km of new roads at 10m servitude width.
- ±250km of existing roads to be upgraded at 10m servitude width.
- ±370km of new overhead fibre lines at 22m servitude width.
- ±73km of new underground fibre & power lines at 5m servitude width.
- Fibre repeater shelters (20m x 20m).
- Radio Frequency Interference monitoring sites (5m x 5m); and
- Weather monitoring stations (5m x 5m).

8.3 SITE DEVELOPMENT PLAN / BUILDING PLANS

The application shall be subject to the NRF submitting site development plans to the Kareeberg, Karoo Hoogland and Hantam Municipalities for approval prior to commencing construction.

Application is made to the competent authority that approval of the detail site development plans and related matters be delegated to a designated official from the Kareeberg, Karoo Hoogland and Hantam Municipalities on condition that the placement of infrastructure and land uses be substantially in accordance with the submitted rezoning plans.

8.4 COMMENTS TO BE OBTAINED DURING THE LAND USE MANAGEMENT PROCESS

All applications that will materially affect the public interest or the interests of the community, if approved, must in terms of sections 27 and 28 of the Kareeberg and Karoo Hoogland Municipal Planning By-Laws, and in terms of sections 35, 45 and 46 of the Standard Draft By-Law on

Municipal Land Use Planning, prepared in terms of the Spatial Planning and Land Use Management Act, 16 of 2013 in the case of Hantam Municipality, give notice of this application.

Such notice of the application must be given in the media and be served on each person whose rights may be adversely affected by the approval of this application.

The rezoning application will thus be advertised and distributed for comment, including inviting comments from the following Departments and institutions (this list is not exhaustive and will be supplemented on request from the Kareeberg, Karoo Hoogland and Hantam Municipalities):

- Department of Transport, Safety and Liaison
- Provincial Department of Roads & Public Works
- Department of Water Affairs
- ESKOM
- Civil Aviation Authority
- Department of Energy
- Northern Cape Department of Cooperative Governance, Human Settlements and Traditional Affairs
- Department of Environment and Nature Conservation
- Department of Agriculture, Forestry and Fisheries

SECTION E: PROJECT PROPOSALS

9 RATIONALE FOR THE PROPOSED INFRASTRUCTURE PROJECT

In 2012, the South African Government adopted the National Development Plan as a long-term strategy to address economic growth and broaden socio-economic transformation in the country. A fundamental component of this overarching plan is the National Infrastructure Plan which aims to catalyse economic development and job creation through infrastructure development.

The Presidential Infrastructure Coordination Commission, as the coordinator and facilitator of the National Infrastructure Plan, subsequently identified 18 Strategic Integrated Projects ("SIPs") which are large-scale infrastructure projects of national importance and located across all nine provinces aimed at unlocking the development potential in the country. Amongst the 18 SIPs, the Presidential Infrastructure Coordination Commission established two Knowledge SIPs:

- **SIP 15:** Expanding access to communication technology, which aims at providing for broadband coverage to all households by 2020; and
- **SIP 16:** SKA and the MeerKAT, which aims at providing an opportunity for Africa and South Africa to contribute towards global advanced science projects.

The National Infrastructure Plan led to the promulgation of the Infrastructure Development Act 23 of 2014, which Act codifies into law the Presidential Infrastructure Coordination Commission and the National Infrastructure Plan as key mechanisms to co-ordinate and drive infrastructure development in South Africa.

The Act aims to facilitate infrastructure development which is of significant economic or social importance to the Republic, by prioritizing the planning, approval and implementation of strategic infrastructure development and improving the management of such infrastructure during all life-cycle phases, including planning, approval, implementation and operations. The Act endeavours to address the lack of co-ordination across the state to ensure common priorities and the management of trade-offs around infrastructure projects, to ensure a sufficiently strong level of public investment, and to improve capacity for managing all phases involved in the development of infrastructure.

It is well known that arid regions of South Africa provide the perfect radio quiet backdrop for the high and medium frequency arrays. Radio telescopes must be located as far away as possible from man-made electronics or machines that emit radio waves that will interfere with the faint radio signals coming from the distant Universe. The site should also be high and dry, because some radio waves are absorbed by the moisture in our atmosphere. Thus, the selection of the project site for the development of the SKA1_MID's ground-breaking continent wide telescope.

10 DEVELOPMENT COMPONENTS

The SKA is proposed to be constructed in two phases:

- Phase 1 (called SKA1_MID) in South Africa and Australia, and
- Phase 2 (called SKA2) expanding into SKA Africa partner countries (Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia), with the component in Australia also being expanded.

The subject of this application is the second stage to Phase 1 - **SKA1_MID**. Phase 1 of the SKA mid-frequency dish array is currently underway and consist of an array of 197 dish-antennas and associated infrastructure. As discussed in paragraph 2.3 64 dish-antennas, i.e. MeerKAT, and associated infrastructure has already been constructed on the core site. The SKA1_MID will

be implemented in two stages, namely SKA Land Core and the Spiral Arms. The latter, which is the subject of this application, consists of approximately 1 200 hectares of privately owned land which will be required for the construction of 21 dish-antennas and supporting infrastructure as illustrated by the figure below.

The rezoning of a mere 40 hectares, i.e. 0.01%, of the entire project site as Extended Astronomy Zone/Utility Zone IV will enable the construction and/or establishment of 21 dish-antennas and 20 photovoltaic plants as part of the proposed SKA1_MID project.

The further registration of servitudes is required for the construction and/or establishment of the following infrastructure:

- Upgrading of existing roads ($\pm 250\text{km}$) and development of $\pm 110\text{km}$ of new roads;
- 33kV powerlines linking PV plants to existing 33kV powerlines;
- Approximately 350km new overhead fibre lines and $\pm 73\text{km}$ new underground fibre and power lines;
- Power and Fibre infrastructure;
- Fibre repeater shelters;
- Weather and general monitoring sites.

A detailed summary of various development components constituting the Extended Astronomy Zone and associated servitude areas is provided in paragraph 12 hereunder.

11 EXTENDED ASTRONOMY ZONE: PROPOSED DEVELOPMENT & INFRASTRUCTURE

11.1 SKA DISH ANTENNAS

Not all of the properties that form part of this application will accommodate the proposed dish-antennas. Most properties will be required to convey new fiber/electricity cables and/or access roads to the dish-antennas.

The properties upon which the dish-antennas are to be erected are listed and described in Tables 8-10 above.

Each dish antenna will be positioned in an area of 100m x 100m (1 hectare) which will be zoned for Extended Astronomy Zone purposes.

Each dish footprint makes provision for a 15 metre diameter dish-antenna installed on a platform with a minimum radius of 26.5m. The platform radius will accommodate a turning dish-antenna transporter, thus allowing for an efficient installation of the dish-antenna, with a bell mouth radius of 24m and a keep out zone of 15m.

All vegetation clearance and construction will be undertaken as per the guidelines of the approved EMPR. It is envisaged that the majority of dish foundations will be piled foundations consisting of a 7m pile cap on an 8m x 0.75m diameter vertical piles. The typical piling depths proposed are between 8.5m and 10m.



Figure 14: Model of Antenna Foundation (top left); Completed Foundation (top right); shutter work prior to concrete casting (bottom left); reinforcing steel for pile cap (bottom right) (Source: Gaea Enviro Pty Ltd, 2018).

11.2 PHOTOVOLTAIC PLANTS

The installation of small solar photovoltaic plants ("PV") with a generation capacity of less than 1 megawatt are proposed to generate additional electricity to prevent potential damages to the dish-antennas due to possible load shedding events.

The PV plants will have a maximum footprint of 100m x 100m (1 hectare) and will be located at least 2km from the dish antennas to prevent radio frequency interference. The footprint area of the PV plants will also be rezoned for Extended Astronomy Zone purposes.

The proposed configuration for the solar PV plant is a free-standing power plant with PV modules oriented towards the north and fixed-mounted at an optimum angle. The inclination of the modules will be optimized to maximize annual energy yield. The Off-Grid Solar PV Power Station design life is 25 years subject to plant operation (except the battery bank, which can be designed for a lower lifespan), and maintenance in accordance with the specific recommendations and normal degradation.

Furthermore, it is proposed to install a small-scale PV installation for remote infrastructure such as weather stations, RFI monitoring stations, security guard huts and radio communication masts. Power will also be provided to remote telescope infrastructure as required. Where this infrastructure is not located within a reasonable distance to a dish power supply, small standalone PV and battery back-up installations will be used to power this equipment. Boreholes will be supplied with commercial photovoltaic panels and equipment which will be RFI tested to ensure compliance to the required RFI standards.

12 ENGINEERING, ACCESS AND SECURITY SERVICES

12.1 ACCESS AND ROADS

As a general rule, existing farm roads will be used to access infrastructure. Approximately 360km of roadworks will be undertaken, which includes the construction of some 110km of new roads in the project site. Tables 12 and 13 below provide a summary of the location of existing road upgrades and new roads to be constructed.

Standard gravel roads will be 5m wide in a 10m wide servitude and will consist of a minimum of a 150mm thick in-situ selected layer, a 150mm thick sub-base layer, 150mm thick base and a gravel wearing course. Stormwater systems for the gravel roads will be provided by a combination of earth channels, concrete channels, culverts, berms and concrete drifts. To channel stormwater flow to the concrete drifts from the farm roads, earth cut-off drains and channels cut by a grader will be used in order to minimise erosion of the gravel layer. The stormwater system will be designed to cater for a 1 in 10 year flood interval.

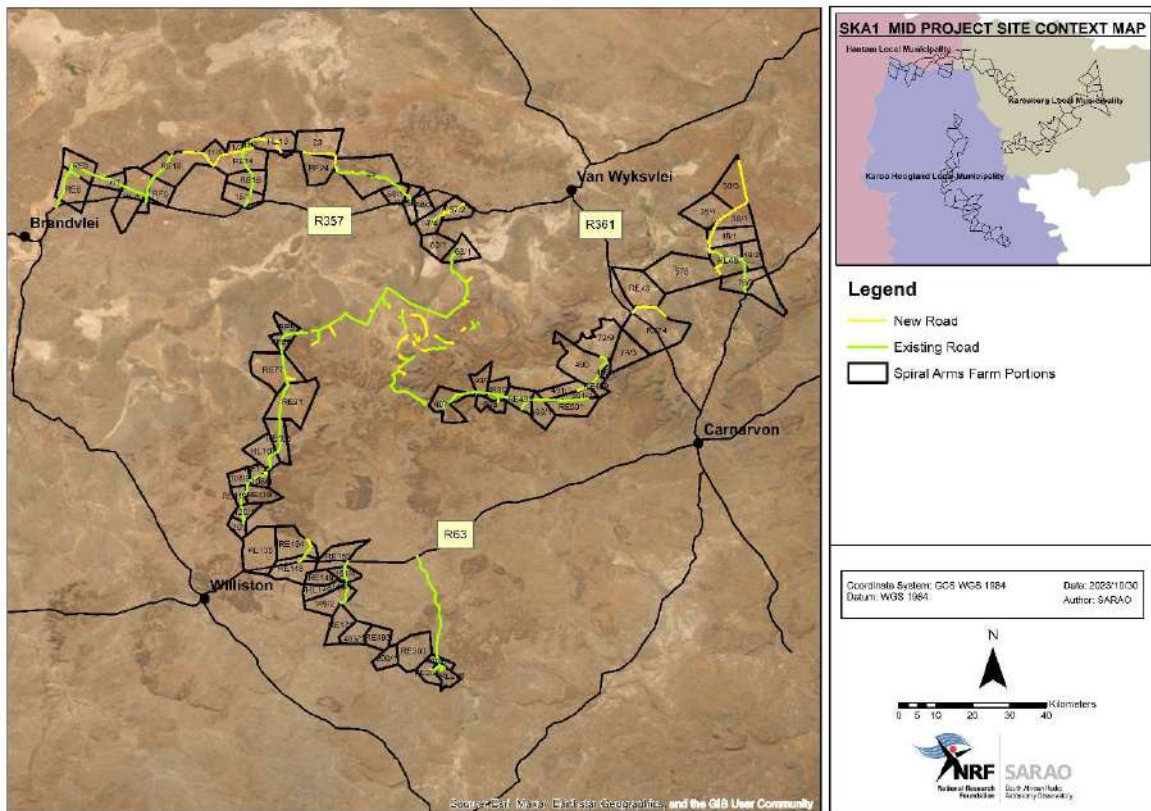


Figure 15: Composite map of estimated locations of existing road upgrades and new access roads to be constructed during SKA1_MID.

Table 11: Distances of existing road upgrades and new access roads to be constructed in Karoo Hoogland Municipality.

EXISTING ROAD UPGRADES AND NEW ACCESS ROADS			
FARM DESCRIPTION	SKA1_MID		PLAN NO.
	UPGRADE (m)	NEW (m)	
Remainder of the Farm Stemregt No. 68	4259	-	Plan No 22
Remainder of the Farm Die Tuin No. 493	-	-	Plan No 43
Portion 1 (Wilda) of the Farm Die Tuin No. 493	-	-	Plan No 42
The Farm Zand Puts No. 77	8310	2182	Plan No 23
The Farm Bissies en Anteel Kolk No. 91	10032	135	Plan No 24
Remainder of the Farm Dassie Kloof No. 105	9256	182	Plan No 25
Remainder of the Farm Oest No. 107	5940	-	Plan No 26
Remainder of the Farm Koega No. 108	3070	1120	Plan No 27
Portion 2 (Klipbank) of the Farm Koega No. 108	1365	-	Plan No 30
Remainder of Portion 3 of the Farm Koega No. 108	-	488	Plan No 29
Portion 4 (a portion of Portion 3) of the Farm Koega No. 108	2693	408	Plan No 28
Portion 1 (Uitkomst) of the Farm Friesland No. 200	-	-	Plan No 44
Remainder of the Farm Bloem-Fontein No. 119	3956	-	Plan No 32
Remainder of the Farm Klip Drift No. 203	-	-	Plan No 45
Remainder of Portion 1 (Vadersklip) of the Farm Korfsplaat No. 204	2164	-	Plan No 47
The Farm Weltevrede No. 205	4669	51	Plan No 48
Portion 1 (Jacobus Daal) of the Farm Bloem-Fontein No. 119	2007	-	Plan No 31
Remainder of Portion 1 (Browns Laage) of the Farm Vaalhoek No. 120	5612	-	Plan No 33
Portion 2 (a portion of Portion 1) of the Farm Vaal Hoek No. 120	-	-	Plan No 34
The Farm Riet Kolk No. 6	11309	200	Plan No 1
Remainder of Portion 1 (Vos Zyn Vlei) of the Farm Vos Zyn Vlei No. 7	7786	-	Plan No 3
The Farm Sunny Side No. 8	8720	-	Plan No 4
Remainder of the Farm Abiquas Puts No. 9	4804	-	Plan No 5
The Farm Leeuw Krantz No. 134	2986	2294	Plan No 36
Remainder of the Farm Ongeluksfontein No. 135	-	-	Plan No 35
Remainder of the Farm Zakfontein No. 148	2426	-	Plan No 37
Remainder of the Farm Langbaken No. 149	-	-	Plan No 38
Portion 2 of the Farm Langbaken No. 149	6137	198	Plan No 40
The Farm Tierkop No. 51	3607	-	Plan No 21

Remainder of the Farm Palmiet Fontein No. 171	-	-	Plan No 41
Remainder of the Farm Korfsplaats No. 204	1102	1055	Plan No 46
Remainder of the Farm Scheerkraal No. 5	7590	-	Plan No 2
TOTAL	119 800	8 313	FIGURE 15

Table 12: Distances of existing road upgrades and new access roads to be constructed in Kareeberg Municipality.

EXISTING ROAD UPGRADES AND NEW ACCESS ROADS			
FARM DESCRIPTION	SKA1_MID		PLAN NO.
	UPGRADE (m)	NEW (m)	
Remainder of the Farm Waterval No. 497	8698	-	Plan No 49
Remainder of the Farm Paarde Vlei No. 73	-	-	Plan No 58
Remainder of the Farm Garst Kolk No. 74	-	10229	Plan No 57
The Remainder of the Farm Wolf Werf No. 23	-	8735	Plan No 12
The Farm Riet Kops Kolk No. 25	15178	4365	Plan No 13
Portion 1 of the Farm Thomas Pan No. 38	-	1970	Plan No 63
Portion 4 (a portion of Portion 3) of the Farm Thomas Pan No. 38	-	5074	Plan No 64
Remainder of the Farm Bottel Put No. 48	12987	7761	Plan No 60
Portion 1 of the Farm Bottel Put No. 48	-	5652	Plan No 62
Portion 2 of the Farm Bottel Put No. 48	382	-	Plan No 61
Portion 2 (Goei Hoop) of the Farm Groot Kolk No. 57	-	6523	Plan No 18
Portion 4 (Grootkolk) of the Farm Groot Kolk No. 57	3465	1238	Plan No 17
Remainder of the Farm Moffys Dam No. 58	1719	527	Plan No 15
Portion 1 of the Farm Moffys Dam No. 58	3831	164	Plan No 14
Portion 3 of the Farm Moffys Dam No. 58	-	-	Plan No 16
Portion 1 of the Farm Jagt Pan No. 62	-	-	Plan No 19
Portion 1 of the Farm Vlak Leegte No. 491	1151	2916	Plan No 55
Portion 1 (Geluk) of the Farm Uitspan-Kolk No. 499	2632	-	Plan No 54
The Farm Bitterpoort No. 576	-	-	Plan No 59
Remainder of Portion 3 of the Farm Thomas Pan No. 38	-	15490	Plan No 65
Portion 1 (Dubbelde Vlei Noord) of the Farm Dubbelde Vlei No. 63	4428	274	Plan No 20
The Farm Kareekloof No. 490	10359	11560	Plan No. 71
Portion 9 of the Farm Jagersberg No. 72	-	-	Plan No 56
Remainder of the Farm Uitspan-Kolk No. 499	9299	485	Plan No 53
Remainder Portion 2 (Bondeblaf Oos) of the Farm Honde Blaf No. 493	6276	39	Plan No 51
Portion 3 (portion of Portion 1) of the Farm Honde Blaf No. 493	2355	-	Plan No 50

The Farm Jagterskloof No. 593	-	756	Plan No 52
TOTAL	82 760	83 758	FIGURE 15

Table 13: Distances of existing road upgrades and new access roads to be constructed in Hantam Municipality.

EXISTING ROAD UPGRADES AND NEW ACCESS ROADS			
FARM DESCRIPTION	SKA1_MID		PLAN NO.
	UPGRADE (m)	NEW (m)	
Remainder of the Farm Zout Poort No. 10	7437	9384	Plan No 6
Portion 1 (Klipkoppies) of the Farm Jan Louws Leegte No. 11	2365	2377	Plan No 9
Portion 5 of the Farm Jan Louws Leegte No. 11	-	5115	Plan No 7
Remainder of the Farm Kameel Boom Puts No. 13	1629	8263	Plan No 10
Portion 2 (a portion of Portion 1) of the Farm Jan Louw Kolk No. 14	-	754	Plan No 11
Portion 3 of the Farm Jan Louws Leegte No. 11	378	3944	Plan No 8
TOTAL	11 809	29 837	FIGURE 15

12.2 ELECTRICITY & FIBRE-OPTIC CABLES

The electrical reticulation will be designed to prevent and minimise potential radio-frequency interference from the electrical infrastructure. The proposed electrical infrastructure will be constructed according to the following reticulation zones:

- Zone 1 (0-5km from the centre of the SKA1_MID core): reticulation via underground cabling only;
- Zone 2 (5-30km from the centre of the SKA1_MID core): reticulation via steel pole overhead lines and underground cabling; and
- Zone 3 (>30km from the centre of the SKA1_MID core): reticulation of fibre via overhead wooden telephone poles, standalone PV and underground cabling.

Tables 14 and 15 below, read together with Figure 16 provides an overview of the power distribution and fibre optic installation.

The proposed activities for the power reticulation network comprises of the following:

- Construct approximately 350km of new overhead cabling and approximately 73km of new 3.3 kV underground cabling to distribute power from the overhead line to dishes located on each of the 3 spiral arms; and
- Construct small scale solar photovoltaic plants, each 1 hectare in extent, to supply power to dish-antennas in the spiral arms.

Power will be provided to the site monitoring equipment i.e. weather stations, visual monitoring, radio frequency monitoring stations and mobile radio repeater stations via 3-phase 400 volt distribution kiosks strategically placed within the project site. These distribution kiosks will be fed directly via the various miniature substations and ground mounted transformers. To limit costs and environmental damage through excessive trenching, electrical, fibre optic cabling, and cables connecting the visual monitoring equipment will be located within the same trench.

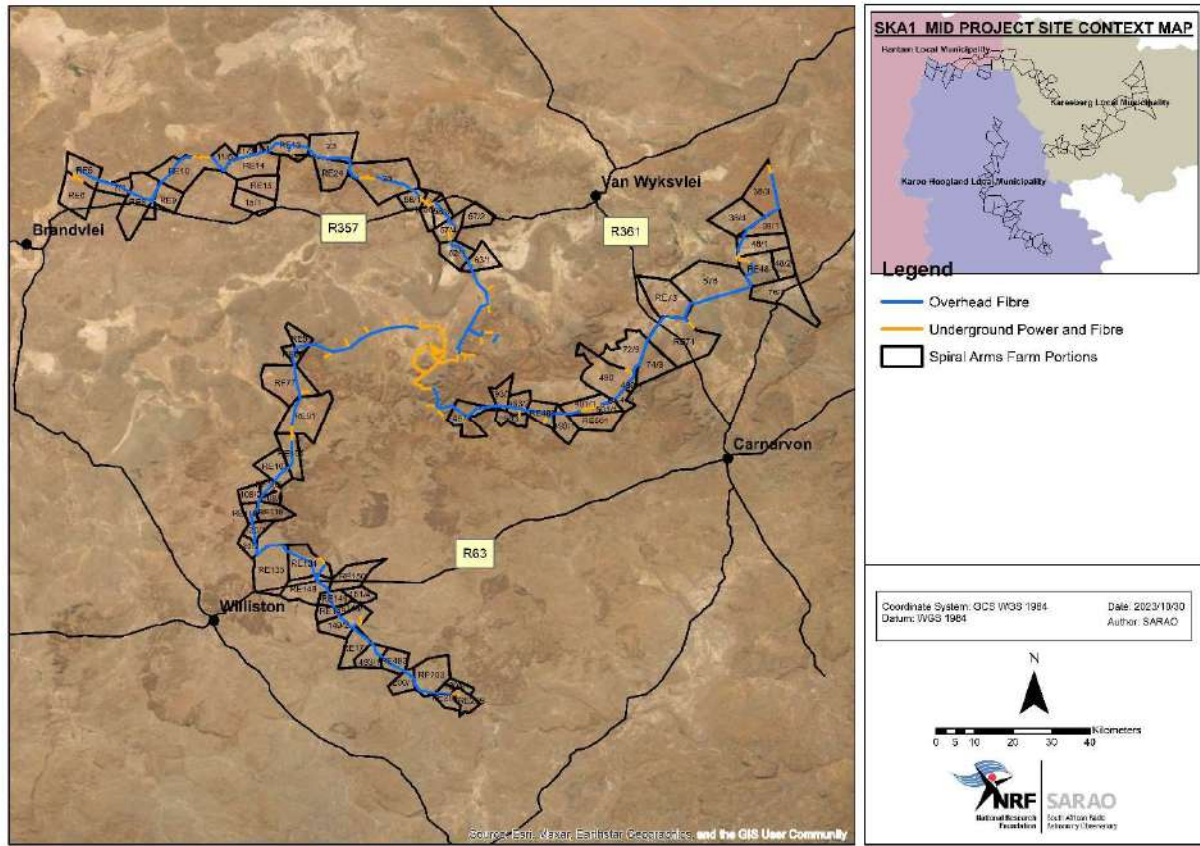


Figure 16: Composite map indicating the electrical and fibre optic cables to be constructed.

Table 14: Length of electrical and fibre optic cables in Karoo Hoogland Municipality.

LOCATION OF ELECTRICAL AND FIBRE OPTIC CABLES (Meter)			
FARM DESCRIPTION	SKA1_MID FIBRE		PLAN NO.
	Trenched (m)	Overhead (m)	
Remainder of the Farm Stemregt No. 68	-	8450	Plan No 22
Remainder of the Farm Die Tuin No. 493	-	6456	Plan No 43
Portion 1 (Wilda) of the Farm Die Tuin No. 493	-	4334	Plan No 42
The Farm Zand Puts No. 77	2240	15239	Plan No 23
The Farm Bissies en Anteel Kolk No. 91	2435	7726	Plan No 24
Remainder of the Farm Dassie Kloof No. 105	2456	6992	Plan No 25
Remainder of the Farm Oest No. 107	-	4856	Plan No 26
Remainder of the Farm Koega No. 108	1183	5174	Plan No 27
Portion 2 (Klipbank) of the Farm Koega No. 108	-	1337	Plan No 30
Remainder of Portion 3 of the Farm Koega No. 108	489	-	Plan No 29

Portion 4 (a portion of Portion 3) of the Farm Koega No. 108	407	-	Plan No 28
Portion 1 (Uitkomst) of the Farm Friesland No. 200	-	2965	Plan No 44
Remainder of the Farm Bloem-Fontein No. 119	-	3882	Plan No 32
Remainder of the Farm Klip Drift No. 203	-	6870	Plan No 45
Remainder of Portion 1 (Vadersklip) of the Farm Korfsplaas No. 204	-	-	Plan No 47
The Farm Weltevrede No. 205	1541	-	Plan No 48
Portion 1 (Jacobus Daal) of the Farm Bloem-Fontein No. 119	-	2037	Plan No 31
Remainder of Portion 1 (Browns Laage) of the Farm Vaalhoek No. 120	-	6320	Plan No 33
Portion 2 (a portion of Portion 1) of the Farm Vaalhoek No. 120	-	2580	Plan No 34
The Farm Riet Kolk No. 6	3212	-	Plan No 1
Remainder of Portion 1 (Vos Zyn Vlei) of the Farm Vos Zyn Vlei No. 7	-	7776	Plan No 3
The Farm Sunny Side No. 8	-	9655	Plan No 4
Remainder of the Farm Abiquas Puts No. 9	-	1681	Plan No 5
The Farm Leeuw Krantz No. 134	2508	12036	Plan No 36
Remainder of the Farm Ongeluksfontein No. 135	-	8784	Plan No 35
Remainder of the Farm Zakfontein No. 148	-	6606	Plan No 37
Remainder of the Farm Langbaken No. 149	-	3939	Plan No 38
Portion 2 of the Farm Langbaken No. 149	2685	5763	Plan No 40
The Farm Tierkop No. 51	-	7059	Plan No 21
Remainder of the Farm Palmiet Fontein No. 171	-	5769	Plan No 41
Remainder of the Farm Korfsplaas No. 204	715	3432	Plan No 46
Remainder of the Farm Scheerkraal No. 5	1551	6019	Plan No 2
Remainder of the Farm Stemregt No. 68	-	2714	Plan No 22
TOTAL	21 422	166 451	FIGURE 16

Table 15: Length of electrical and fibre optic cables in Kareeberg Municipality.

LOCATION OF ELECTRICAL AND FIBRE OPTIC CABLES (Meter)			
FARM DESCRIPTION	SKA1_MID FIBRE		PLAN NO.
	Trenched (m)	Overhead (m)	
Remainder of the Farm Waterval No. 497	2322	14280	Plan No 49
Remainder of the Farm Paarde Vlei No. 73	-	4541	Plan No 58
Remainder of the Farm Garst Kolk No. 74	2252	12274	Plan No 57
The Remainder of the Farm Wolf Werf No. 23	-	11284	Plan No 12
The Farm Riet Kops Kolk No. 25	4932	14250	Plan No 13

Portion 1 of the Farm Thomas Pan No. 38	-	1970	Plan No 63
Portion 4 (a portion of Portion 3) of the Farm Thomas Pan No. 38	-	5075	Plan No 64
Remainder of the Farm Bottel Put No. 48	4184	6582	Plan No 60
Portion 1 of the Farm Bottel Put No. 48	1218	4432	Plan No 62
Portion 2 of the Farm Bottel Put No. 48	-	-	Plan No 61
Portion 2 (Goei Hoop) of the Farm Groot Kolk No. 57	-	-	Plan No 18
Portion 4 (Grootkolk) of the Farm Groot Kolk No. 57	4980	2291	Plan No 17
Remainder of the Farm Moffys Dam No. 58	3195	-	Plan No 15
Portion 1 of the Farm Moffys Dam No. 58	1939	2005	Plan No 14
Portion 3 of the Farm Moffys Dam No. 58	988	5415	Plan No 16
Portion 1 of the Farm Jagt Pan No. 62	-	6924	Plan No 19
Portion 1 of the Farm Vlak Leegte No. 491	5384	6315	Plan No 55
Portion 1 (Geluk) of the Farm Uitspan-Kolk No. 499	-	2593	Plan No 54
The Farm Bitterpoort No. 576	-	14344	Plan No 59
Remainder of Portion 3 of the Farm Thomas Pan No. 38	2636	12846	Plan No 65
Portion 1 (Dubbelde Vlei Noord) of the Farm Dubbelde Vlei No. 63	3003	4552	Plan No 20
The Farm Kareekloof No. 490	3818	8100	Plan No 71
Portion 9 of the Farm Jagersberg No. 72	-	9298	Plan No 56
Remainder of the Farm Uitspan-Kolk No. 499	2611	7596	Plan No 53
Remainder Portion 2 (Bondeblaf Oos) of the Farm Honde Blaf No. 493	1444	4527	Plan No 51
Portion 3 (portion of Portion 1) of the Farm Honde Blaf No. 493	-	3127	Plan No 50
The Farm Jagterskloof No. 593	768	-	Plan No 52
TOTAL	45 674	164 621	FIGURE 16

Table 16: Length of electrical and fibre optic cables in Hantam Municipality.

LOCATION OF ELECTRICAL AND FIBRE OPTIC CABLES (Meter)			
FARM DESCRIPTION	SKA1_MID FIBRE		PLAN NO.
	Trenched (m)	Overhead (m)	
Remainder of the Farm Zout Poort No. 10	5121	14124	Plan No 6
Portion 1 (Klipkoppies) of the Farm Jan Louws Leegte No. 11	-	2376	Plan No 9
Portion 5 of the Farm Jan Louws Leegte No. 11	-	5111	Plan No 7
Remainder of the Farm Kameel Boom Puts No. 13	1337	12715	Plan No 10
Portion 2 (a portion of Portion 1) of the Farm Jan Louw Kolk No. 14	745	-	Plan No 11

Portion 3 of the Farm Jan Louws Leegte No. 11	-	3945	Plan No 8
TOTAL	7 203	38 271	FIGURE 16

12.3 WATER DEMAND AND SUPPLY

The estimated water demand for the proposed project is 482 kL per day during peak construction (infrastructure). The water demand includes the use of water for the construction camp at Visserskloof, maintenance of roads during construction, road construction and concrete operations.

A geohydrological study were undertaken to, amongst others, test and confirm the sustainable yields of the water abstraction boreholes. The borehole locations were chosen based on their proximity to the SKA land core area, the construction camps and the proposed construction areas along the spiral arms.

Table 17: Estimated SKA1_MID daily water demand.

DESIGN WATER DEMAND					
MAIN ACTIVITY	SUB-ACTIVITY	DAILY DEMAND (l/day)	AVG. DAILY FLOW (l/sec)	PEAK FLOW (l/sec)	COMMENT
Visserskloof construction camp	Domestic use	65,000	0.7523	3.0	Based on 500 people & 130l/c/d demand
	Other	2,500	0.0289	0.1	2500l/day
Total – Visserskloof		67,500	0.7813	3.1	48 hours storage = 135,000 litres
Road construction	New roads	120,000	1.39		1000m ³ /day production rate & 6% moisture to achieve OMC
	Upgrading	120,000	1.39		1000m ³ /day production rate & 6% moisture to achieve OMC
Concrete operations	Mixing	80,000	0.93		400m ³ /day production rate
	Curing	14,000	0.16		400m ³ /day production rate
	Losses	9,400	0.11		10% losses
Maintenance	MeerKAT roads maintenance	30,250			
Construction dust control	General dust prevention	15,000	0.17		
	Losses	1,500	0.02		10% losses
Total - Construction		414,150	4.79		24hrs storage capacity = 414,150 litres
TOTAL		481,650			

The water supply within the project site exceeds the demand. The borehole yield test results confirmed a total surplus of 59kl/day over the full project footprint when comparing the total sustainable yield and the estimated demand. The geohydrological study found that the water supply along spiral arm 2 (Williston) exceeds the demand imposed by the project, while the yield of the boreholes in spiral arms 1 (Brandvlei) and spiral arm 3 (Carnarvon/Vanwyksvlei) show a significant deficit. It is therefore proposed that this water shortfall in spiral arms 1 and 3 be addressed through trucking of water from the SKA land core area and storage in water storage tanks. There are also alternative water supply sources that have been identified in the four surrounding towns of Carnarvon, Williston, Brandvlei and Van Wyksvlei.

However, to balance the need to complete the project on time and the requirement to minimize the impact of water abstraction in this water scarce area, it is proposed that the total daily use of water be capped at 450 kL per day. This would therefore allow construction activities in various areas while limiting the impact of water abstraction.

Water samples from the proposed abstraction boreholes were tested to determine suitability for use in construction and the results confirm that the water does not contain any material that could negatively affect the quality of the works and can thus be used for construction purposes. The water used for construction purposes will not be chemically treated. Water consumed in the construction areas will be of the same quality (or better) as purified water in the construction camps.

Based on a 48-hour storage requirement, a total of 135,000l will be stored at the Visserskloof construction camp in tanks with a 10 000 litre capacity in uPVC or standard steel structures which will allow for scaling down of the capacity as required and for use elsewhere on site. In case of an emergency (i.e. borehole pump failure) water will be trucked from the nearest borehole to the storage tanks at the construction camps.

Water from the storage tanks will be used for two domestic purposes i.e.. (1) drinking/cooking and (2) washing, thus two different treatment methodologies will be implemented. Water used for drinking and cooking will be treated by Reverse Osmosis and Ultraviolet light and the water used for washing will be disinfected through chlorination. As a result, two types of bulk reticulation systems will be constructed:

- Purified Water - About twenty-five percent (25%) of the allocated 130l/c/day will be purified; and
- Disinfected water - Remaining seventy-five percent (75%) disinfected.

In an effort to optimise the use of water within the project site, water conservancy tanks will be installed downstream of the wastewater treatment facilities. As per the Department of Water and Sanitation requirements, water meters will be installed at each borehole to measure water usage. This will be monitored by the Department to ensure that the daily water usage allowance as approved in the Water Use License for the site (refer to licence no. 10/D54E/ACEGI/11363) is not exceeded.

12.4 SEWAGE AND EFFLUENT MANAGEMENT

It is recognised that the proposed infrastructure would not result in the need for sewerage treatment facilities. At most, construction teams might make use of temporary portable ablution facilities.

Due to the remoteness of the project site, there are no wastewater treatment plants within the vicinity to which the wastewater of these ablution facilities can be efficiently conveyed. As a result, a package treatment plant was installed to process all the wastewater generated by the SKA Land Core development. The package treatment plant was installed within the development footprint of the Vissers Kloof construction camp. It is to be noted that the latter does not form part of this application and is situated outside the project site.

The modular design of the package treatment plant makes them capable of handling increased capacity by adding additional units if the site requires and these modular designs are easily moved to different locations and re-commissioned. All machinery and electrical equipment for the plant is housed in a lockable weatherproof refurbished shipping container.

The water treatment process at the construction camp include:

- pre-digestion of the raw sewage in a 'full kit' surface plant, in Lilliput® tanks, by anaerobic bacteria, converting most of the complex organic matter into simple but toxic chemicals with excess effluent returned to the septic tank to ensure complete treatment;
- clarifier is then used to extract excess solids and return them to the septic tank;
- final stage of treatment including disinfection, which ensures that any pathogens are removed.

Any sewage sludge from wastewater treatment processes are disposed of at a regional sewage plant via vacuum tankers.

13 MANAGEMENT OF CONSTRUCTION AND OPERATIONAL PHASES

As stated in paragraph 4.1 the potential environmental impacts relating to the proposed SKA1_MID have been identified in the SEA undertaken by the CSIR for Strategic Integrated Project 16: SKA1_MID. The gazette IEMP (refer to paragraph 4.1) includes an Environmental Management Programme ("EMPr") which aims to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This approach will limit corrective measures needed during the construction phase of the proposed project.

13.1 CONSTRUCTION CONTROL

"Pre-construction" refers to the period leading up to and prior to commencement of construction activities. The EMPr makes provision for pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and will be mitigated through the contingency plans identified in the pre-construction phase (**The approved construction phase EMPr is included in the IEMP. However, due to the sheer volume of the IEMP same has not been included herewith but is available on the NRF's website and on request.**)

13.2 OPERATIONAL MANAGEMENT

Management measures have also been proposed for the "operational phase" of the proposed project which measure addresses all operation activities that will occur within the development area and access roads, once the construction activities are completed. Many potential environmental impacts will have immediate or long-term effects during the operational phase (e.g. noise, waste management, and water pollution). If the development is monitored on a continual basis during operations, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the measures outlined in the approved EMPr, together with a commitment to sound environmental management from NRF and its management team (**The approved operational phase EMPr is included in the IEMP. However, due to the sheer volume of the IEMP same has not been included herewith but is available on the NRF's website and on request.**)

SECTION F: COMPLIANCE WITH RELEVANT POLICY

14 RELEVANT PLANNING POLICY AND FRAMEWORKS

14.1 NORTHERN CAPE ENVIRONMENTAL IMPLEMENTATION PLAN

The National Environmental Management Act 107 of 1998 ("NEMA") requires every province to prepare Environmental Implementation Plans ("EIPs") to co-ordinate environmental policies, plans, programs and decisions and to secure the protection of the environment. Many of the activities undertaken by government departments, at the national, provincial, district and local level, have impacts on the environment. In order to move officials towards considering environmental issues across departments and municipalities in a cooperative manner, NEMA calls for the development of provincial EIPs, which is binding on all organs of state affected by it and as such their functions must be exercised in accordance therewith.

The EIP lists the SIP 16: SKA under Section 2 of the Plan which section lists new policies, plans and programs of the department that, when implemented, may significantly affect the environment both positively and negatively. It notes that the SKA might lead to a loss of biodiversity.

As discussed in paragraph 4.1 above the SKA1_MID project has been informed by a SEA which included a thorough assessment of the state of the environment within which the project site is located. All areas not suitable for development were identified and subsequently informed the design and placement of the proposed infrastructure. The loss of biodiversity, if at all, is limited to the absolute minimum.

14.2 NORTHERN CAPE GROWTH AND DEVELOPMENT STRATEGY

The Northern Cape Provincial Growth and Development Strategy ("PGDS") is based on a long-term view of the Northern Cape's development trajectory.

The PGDS has allowed for the identification of a series of provincial growth and development objectives and targets and the inter-departmental and inter-governmental strategies, programmes and plans to achieve them. Through the closer alignment of planning and budgeting, it will be possible to ensure that the allocation of provincial government resources is in line with the development objectives and maximize the developmental impact of public sector spending.

The PGDS Conceptual Framework comprises four drivers of change expressing the importance of a developmental state driven by policy directives and underpinned by societal values. From these drivers the paths to prosperity (towards the envisioned outcomes) are derived, which will ultimately guide and inform the required strategic interventions for the PGDP and inform the required strategic interventions for the PGDP.

- **DRIVER 1: ECONOMIC GROWTH, DEVELOPMENT AND PROSPERITY:** To ensure economic growth that will lead to increased development and prosperity for the people of the Northern Cape Province, a conscious effort is required to change the economic trajectory of the Province.

Of the developmental outcomes that have been identified, the following is of particular

relevance to the proposed SKA1_MID:

As a strategic intervention in re INNOVATION AND THE KNOWLEDGE ECONOMY it is proposed that partnerships be facilitated between state entities and civil society concerning the SKA for positive spin-off effects directly and indirectly related to the SKA project.

The following High Impact Projects are proposed:

- Promotion of Science Tourism: Astro- and science tourism now has a base that the province can build and expand upon further to entice even more visitors to the region.
- Development of a state-of-the-art Science Visitor Centre in Carnarvon which can stimulate local investments by local stakeholders such as regional tourism marketing, science education, and linkages with Sutherland, including a Digital Science Exploratorium with links to Kimberley labs.
- SIP 16: SKA - The development of the road infrastructure; Use of local contractors to bridge finance; Assistance with the project's CIDB rating; Community engagement; Inviting provincial engineering contractors on site visits to explore possible opportunities in the Province.

As a High Impact Project in re TOURISM MARKET DEVELOPMENT the construction and operation of a science visitor center dedicated to the SKA has been identified. This center will serve as a tourism facility in support of promoting astro tourism in the province.

- DRIVER 2: SOCIAL EQUITY & HUMAN WELFARE: The Northern Cape Province must unlock economic growth for those who are currently excluded (including the youth and vulnerable groups) and create an environment that is conducive to economic empowerment, entrepreneurship and self-enrichment.
- DRIVER 3: ENVIRONMENTAL SUSTAINABILITY AND RESILIENCE: The Northern Cape Province has an abundance of natural resources and environmental assets. While these present a plethora of economic opportunities, a concerted effort must be made to ensure that these are protected and enhanced. At the same time, the Province must ensure that enough is done to protect communities against the potential threats of environmental harm and unsustainable resource exploitation.

As a High Impact Project in re IMPROVING ENVIRONMENTAL SUSTAINABILITY it was proposed in the Expansion Strategy that protected areas be expanded within the Northern Cape.

- DRIVER 4: ACCOUNTABLE & EFFECTIVE GOVERNANCE: The Northern Cape Province needs a capable and accountable governance system, with a focus on streamlining inter-governmental relationships while strengthening participatory governance with civil society.

14.3 NORTHERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK

The recently updated 2019 Northern Cape Provincial Spatial Development Framework ("PSDF") brings the 2012 approved PSDF (approved 31 July 2012) in line with the most recent legislative and policy changes and addresses more current aspects insofar the spatial development and management of the Northern Cape.

The PSDF will act as an enabling mechanism that responds and complies with, in particular, the National Spatial Development Framework ("NSDF"). The latter encourages lower sphere spatial development plans and frameworks (such as the PSDF) to create an environment that promotes a developmental state. The PSDF aims to address the current situation in the Northern Cape and builds on the notion that such a scenario requires innovative economic intervention, which can only result from a dynamic and effective developmental state.

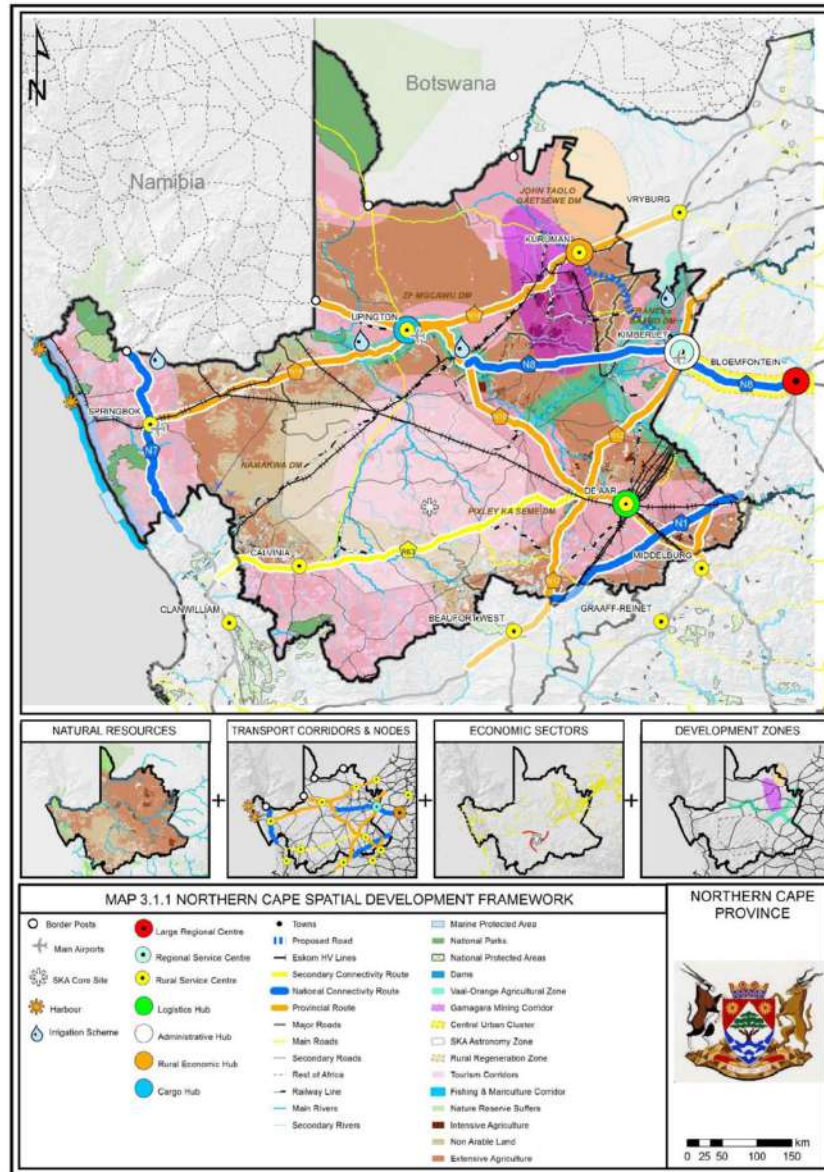


Figure 17: Composite Spatial Vision for the Northern Cape Province (Source: NCPSPDF, 2019).

The PSDF is to function as an innovative strategy that will apply sustainability principles to all spheres of land use management throughout the Northern Cape and which is to facilitate practical results, as it relates to the eradication of poverty and inequality and the protection of the integrity of the environment. In short, the PSDF is to serve as a mechanism towards enhancing the future of the Northern Cape and its people by ensuring that:

- All land-uses enable people to have sustainable livelihoods and enhance the integrity of the environment through effective resource management;
- Innovative management skills and technologies are employed to bring human demands for resources into balance with the carrying capacity of the environment;
- To capitalise on the comparative and competitive advantages, in a sustainable manner, which the Northern Cape holds over its bordering provinces and the neighbouring countries abutting the Northern Cape.

As a first step towards a holistic spatial development strategy for Northern Cape Province, a

Composite Spatial Map was formulated that model's spatial direction and context to future developments (refer to Figure 18 below). This framework promotes, clarifies and refines the spatial development principles and development priorities supported by relevant policies and legislation and define the desired spatial form of Northern Cape Province.

Four strategic objectives were identified providing Strategic Focus Areas (areas of intervention on provincial, district and local level) in support of the Composite Vision, ie:

- Spatial Development Strategy 1: ENHANCE REGIONAL CONNECTIVITY
- Spatial Development Strategy 2: PROTECT AND MANAGE BIODIVERSITY, WATER AND AGRICULTURAL RESOURCES
- Spatial Development Strategy 3: INFRASTRUCTURE INVESTMENT
- Spatial Development Strategy 4: URBAN AND RURAL DEVELOPMENT

Of relevance to this application is Spatial Development Strategy 2 and Spatial Development Strategy 3 (Spatial Plan for SPC F) and detailed plans (Spatial Plan for SPC A and SPC F respectively) and strategies have been proposed to assist with implementation.

14.3.1 SPATIAL DEVELOPMENT STRATEGY 1: ENHANCE REGIONAL CONNECTIVITY

In furtherance of facilitating practical results the PSDF identified Development Zones, geographical areas where appropriate activities are allowed and is aimed at facilitating economic development in the province.

The following Development Zones were developed to address the challenges posed by urban and rural development:

- **The SARAO Astronomy Zone;**
- The Gamagara Mining Corridor;
- The Vaal-Orange Agricultural Zone;
- Agricultural Corridor Zone 2;
- Nature Reserve Buffers;
- Rural Regeneration Zone;
- Tourism Corridor; and
- Solar Corridor.

The PSDF then provides objectives and proposed functions for each of the Development Zones. The following activities are declared as prohibited or restricted activities in the core or central SARAO Astronomy Zone:

- Prospecting or mining activities;
- The construction, expansion or operation of any fixed radio frequency interference source;
- Harmful industrial processes;
- The construction and development of new business or residential areas or recreational facilities;
- The construction or expansion of road or rail transport networks or parts thereof;
- The construction or expansion of any airfield or airport;
- The operation, construction or expansion of facilities for the generation, transmission or distribution of electricity;
- Activities capable of causing light pollution, including the installation or operation of street lighting, outdoor security lights, laser promotional lights or self-lit billboards;
- Activities capable of causing radio frequency interference, including bringing into the area or operating any interference source, mobile radio frequency interference source or short-range device;
- Activities capable of causing air pollution; and

- Any other activity which may detrimentally impact on astronomy and related scientific endeavours, or the astronomy advantage of any core or central astronomy advantage area.

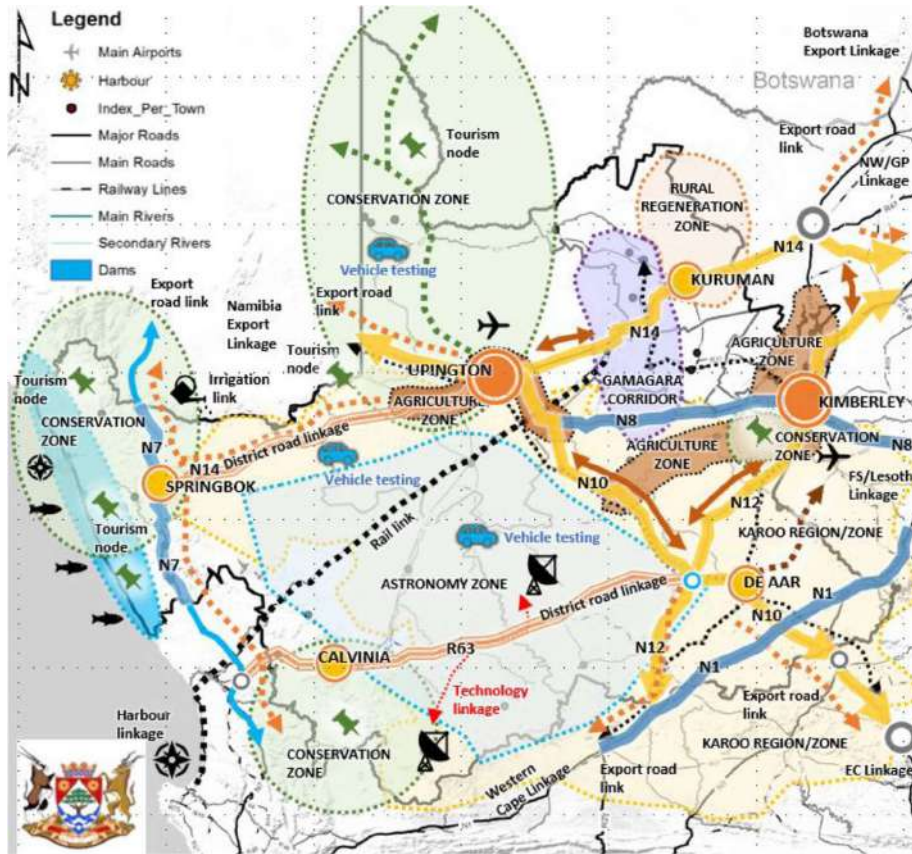


Figure 18: Northern Cape Development Zones (Source: NCPSTDF, 2019).

It further identifies the following functions (proposed uses) in respect of the SARAO Astronomy Zone:

- Science and technology development;
- Broadband development;
- Restricted development (frequencies);
- Tourism development;
- Nature Conservation / declaration of a Biosphere Reserve;
- Research development; and
- IT development industries.

14.3.2 SPATIAL DEVELOPMENT STRATEGY 2: PROTECT AND MANAGE BIODIVERSITY, WATER AND AGRICULTURAL RESOURCES

The strategies proposed to Protect and Manage Biodiversity, Water and Agricultural Resources (Spatial Development Strategy 2) are:

- Protecting and managing the protected national and provincial parks, as well as protected ocean areas;
- Expand and further the establishment of the Protected Areas Network;
- Protecting strategic assets;
- Effective use of national protected and nature areas must be ensured, to support rural livelihoods, especially related to custodianship and tourism opportunities;
- Protecting and restoring Priority National Ecological Infrastructure Regions that is of national importance; and

- Protecting high potential and unique agricultural resources.

The PSDF identified the need to formulate a Protected Area Expansion Strategy for the Northern Cape to assist with the establishment of a protected areas expansion network through the Protected Areas Act 57 of 2003, as illustrated by Figure 19 below.

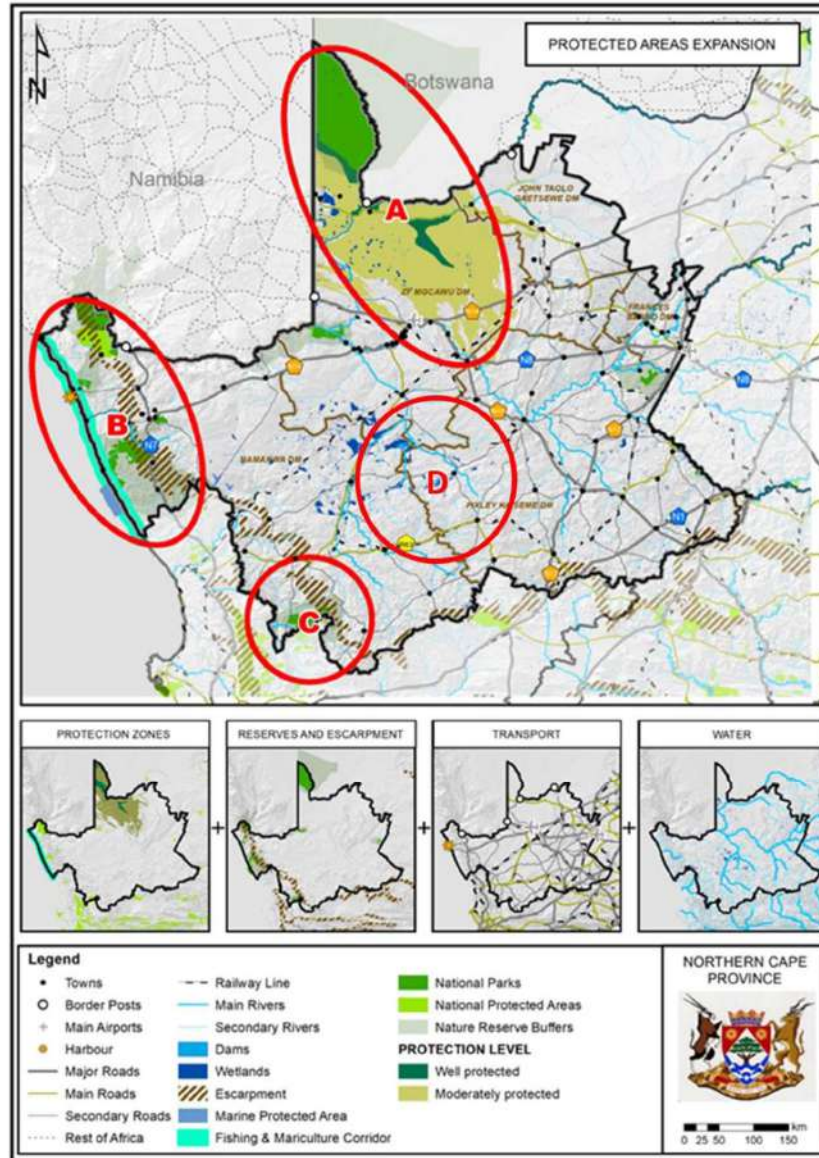


Figure 19: Protected Areas Expansion (Source: NCPSDF, 2019).

It is thus clear that the PSDF acknowledges the importance of the proposed SKA1_MID project and the various strategies and proposals in support thereof. Not only does the proposed SKA1_MID complies with the principles of the PSDF, but it will also assist in reaching specific environmental conservation goals, thus satisfying the consistency principle of the PSDF.

14.4 PIXLEY KA SEME DISTRICT MUNICIPALITY

14.4.1 INTEGRATED DEVELOPMENT PLAN

The fifth generation Integrated Development Plan for the Pixley Ka Seme District Municipality were revised for the period 2022-2027.

It sets out the following strategic objectives for the district:

- To enhance Compliance with the tenets of good governance as prescribed by legislation and best practice.
- To Administer finances in a sustainable manner and strive to comply with legislative requirements to achieve a clean audit outcome.
- To Monitor and support local municipalities to enhance service delivery.
- To promote economic growth in the district.
- To Guide local municipalities in the development of their IDP's and in spatial development.
- To provide a professional, people- centred human resources and administrative service to citizens, staff and Council.
- To provide an independent and objective internal audit assurance and consulting service to add value and to improve the administrative operations of all the municipalities in the district through an approach that is systematic and disciplined.
- To provide disaster management services to the citizens.
- To provide municipal health services to improve the quality of life of the citizens.

The IDP highlights that unemployment and inequality remains a challenge within the region. Subsequently the Municipality highlights their commitment to promotion of local economic empowerment and development through working with communities and the private sector.

The IDP notes the presence of the SKA project as a major strength in the region. It also identifies this as a source of opportunities for manufacturing and the youth in the area to take advantage of. With regards to the former, the IDP aligns with the National LED Policy Framework in which several policy pillars/thrusts are identified. Thrust 7: Manufacturing focusses on the production or assembly of goods such as renewable energy components, SKA components, etc. the SKA solar assembly centre and solar PV is regarded as major projects which can contribute towards this Thrust.

The success of the SKA project is further elaborated on in the IDP as it deals with Sector Department Contributions. The objectives of the Department of Science and Innovation in the District Municipality are to:

- Optimise South Africa's contribution to, and benefit from, the international SKA Project.
- Establish and sustain globally competitive and transformed radio astronomy and space geodesy research and infrastructure in South Africa, and abroad, where appropriate.
- Optimise the associated national socio-economic benefit from radio astronomy and space geodesy activities.
- Promote radio astronomy and space geodesy capacity in Africa.

Further successes of the SKA project include SMME development, technical and artisan training and school programs whilst there is still a need for improved partnership, integration and leveraging of the construction of the SKA.

The Municipality states that the IDP should be regarded as a tool for all three spheres of government to achieve accelerated service delivery to all communities. In this regard it is imperative that the SKA project be seen in the broader regional context and that all spheres of government become involved in optimising, sharing and sustaining these collateral benefits to the local and regional economy.

14.4.2 SPATIAL DEVELOPMENT FRAMEWORK

The Pixley ka Seme District's Spatial Development Framework / Land Development 2013 – 2018 (6th Draft, May 2014⁹) focused on the broader spatial patterns that are to inform its Local Municipalities spatial planning.

The SDF strives to achieve the vision for Pixley Ka Seme District Municipality: "Pixley Ka Seme DM, PIONEERS of DEVELOPMENT, a HOME and FUTURE for all".

In order to achieve their vision the SDF supports and aims to ensure much needed economic growth by identifying development areas and nodes and putting forward spatial proposals and prioritizing projects that will be linked to Council 's budget via the IDP process and as such implemented. The SKA has been identified as one of these projects that could ensure international focus on the Pixley Ka Seme District while potentially unlocking other development corridors together with a range of renewable energy projects.

It is noted that the SKA is addressed in great detail in the SDF and scored as the top priority project according to the District Municipality's Standard Priority Matrix, thus confirming it as a huge asset to the region.

The SDF emphasizes the importance of building on the District's comparative and competitive advantages in niche areas with real potential. The SKA was identified as one such niche project which is of global importance and interest and provides major infrastructure development and investment in the area. This is linked to new skills development and the potential for job creation. The development also provides opportunity for training, construction and maintenance. This will assist in retaining skilled people in the area that can further assist in local economic development and upliftment.

The SDF concluded with the statement that there is a need for the Northern Cape Government to support various initiatives in order to create an enabling environment for MeerKAT and the SKA. Opportunity for private sector involvement through corporate social investment programmes to assist with social upliftment programmes in the area.

14.5 NAMAKWA DISTRICT MUNICIPALITY

14.5.1 INTEGRATED DEVELOPMENT PLAN

The fifth generation Integrated Development Plan for Namakwa District Municipality were revised for the period 2022-2027.

It sets out the following strategic objectives for the district:

- Monitor and support local municipalities to deliver basic services which include water, sanitation, housing, electricity and waste management
- Support vulnerable groups
- Improve administrative and financial viability and capability
- Promote and facilitate Local Economic development
- Enhance good governance
- Promote and facilitate spatial transformation and sustainable urban development
- Improve communication and communication systems

⁹ Prepared by CK Rumboll & Partners, May 2014

- Establish a customer care system
- Invest in the improvement of ICT systems
- To render a municipal health services
- To coordinate the disaster management and fire management services in the district
- Implement the climate change response plan
- Caring for the environment

It provides for sectoral plans to be drafted to ensure alignment between the different organs of state and to provide input in the overall strategic objectives of the Municipality although it is focused on specific issues. It records that the Spatial Development Framework for the District is outdated and should be reviewed.

With regards to the SKA project, the IDP recognises the same as a catalytic project that can grow the economy, aid in service delivery and institutional stability.

14.5.2 SPATIAL DEVELOPMENT FRAMEWORK

The Namakwa District Spatial Development Framework were drafted in October 2012 (CNDV Africa Planning and Design CC, October 2012) and although it requires revision, as mentioned in the District's IDP, the basic principles and proposals remains relevant.

The SDF records the spatial vision for the District as an exciting mix of:

- Cultural wilderness, floristic, river and coastal tourism;
- Mining and mining beneficiation;
- Agriculture including intensive irrigation and dryland farming, livestock grazing and game.
- Mariculture and coastal opportunities that includes fishing and abalone ranching.

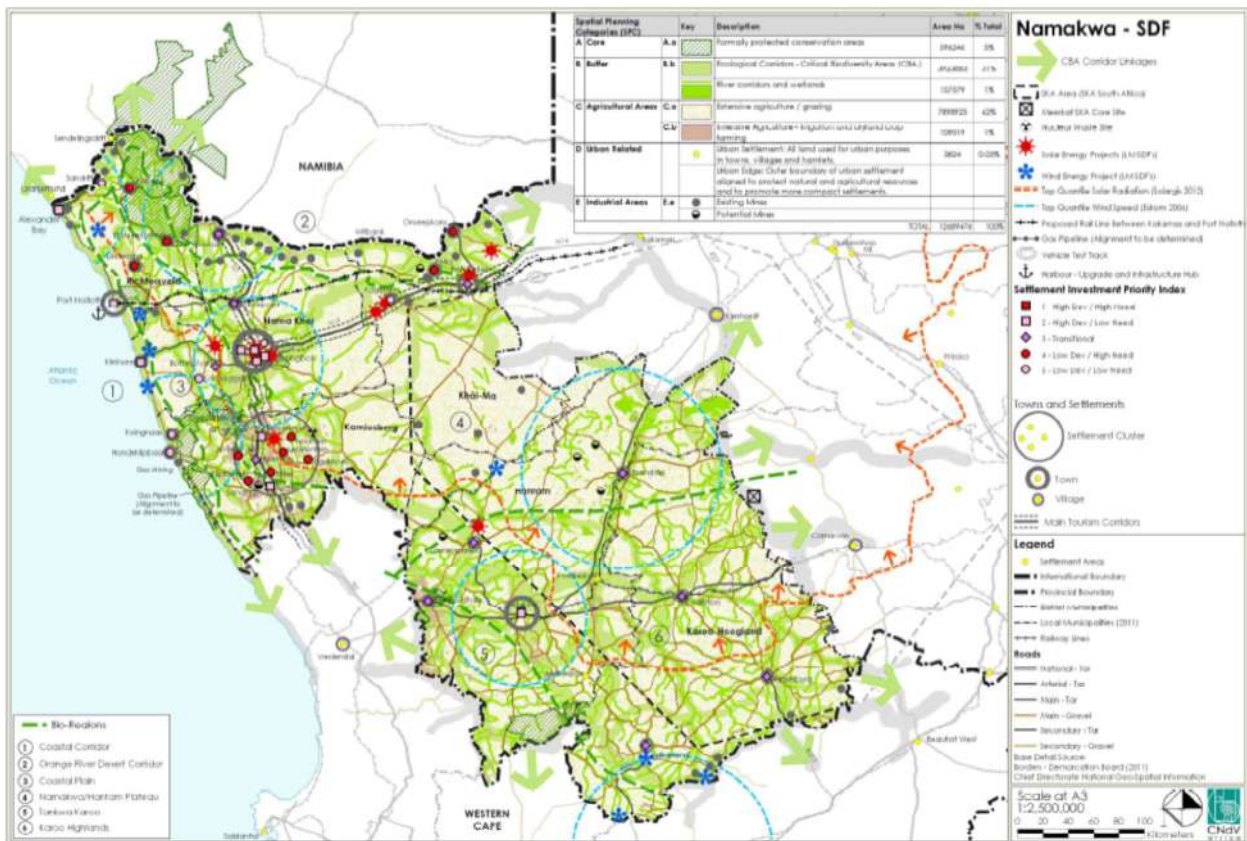


Figure 20: Namakwa District Municipality SDF (Source: CNDV Africa Planning & Design CC, October 2012).

It indicates that the implications of the Vision for the District includes:

- Ensuring adequate and appropriate infrastructure; for example, in order to promote wilderness tourism and 4x4 trails it may be better to maintain gravel roads rather than tar them.
- Maximising the amount of beneficiation that occurs from mining and agriculture through providing necessary facilities, training, education, environmental development and business support with a focus on economic empowerment
- Eradicate poverty and improve social development by strengthening the economy and thriving sectors.

As a response to the Vision and its implications the SDF identified the following six main spatial elements to form the basis for organizing the spatial development of the District:

- Biodiversity / tourism corridors;
- Major transport corridors;
- Agricultural centres;
- SKA Zone;
- Key settlements; and
- Mining centres.

The SDF directs that the proposed SKA1_MID, which is also identified in the SDF as a "major infrastructure project" must be carefully planned in order to ensure that the District reaps the benefits from this massive investment.

The SDF clearly acknowledges the importance of the proposed SKA1_MID by including the project in specific proposals for the Karoo Highlands Bioregion (generally the Karroo Hoogland municipal area). The proposed SKA1_MID implementations priority project SDF9 as listed in the Namakwa SDF and further assist with the implementation of conservation ideals in that core conservation areas will be extended upon approval of the rezoning application.

14.6 KAREEBERG LOCAL MUNICIPALITY

14.6.1 INTEGRATED DEVELOPMENT PLAN

The fifth generation IDP 2022-2027 was developed as part of the continuous cycle of planning, implementation and monitoring.

The IDP recognises that it must link, integrate and coordinate developments plans for the Municipality and must be compatible with national developments plans and planning requirements binding on the Municipality and should therefore serve as a guideline for where sector departments allocated their resources at local government level.

In this regard, SKA has been identified as a major catalyst for economic development and job creation in the region. The contribution of SKA to the development of a town such as Carnarvon is well documented. The IDP notes that careful planning and monitoring of outcomes are required in order to optimise, share and sustain collateral benefits of the investments to the local and regional economy and by implementation, to the local communities.

It is thus clear that the Municipality considers the SKA as an important stakeholder to assist with accelerated development, job creation, improvement of existing infrastructure and creation of new opportunities.

The proposed SKA1_MID project is highlighted as an opportunity in the Kareeberg IDP. It recognizes the project as one of the most significant investments of any kind in recent years.

14.6.2 SPATIAL DEVELOPMENT FRAMEWORK

The Kareeberg Spatial Development Framework 2018 – 2023 ("SDF") (Ditsamai Investments and Projects, June 2019) serves as the strategic spatial framework that guides the desired spatial distribution of land uses, spatial priorities and strategic infrastructure provision within the municipal area.

The SDF favours Carnarvon as a rural service centre and highlights the fact that the town serves as an Astronomy Node with key astronomy and tourism functions provided to the Northern Cape. It however emphasizes the fact that very limited economic opportunities are evident in the region apart from the development initiatives of SARAO and the small-scale agricultural sector.

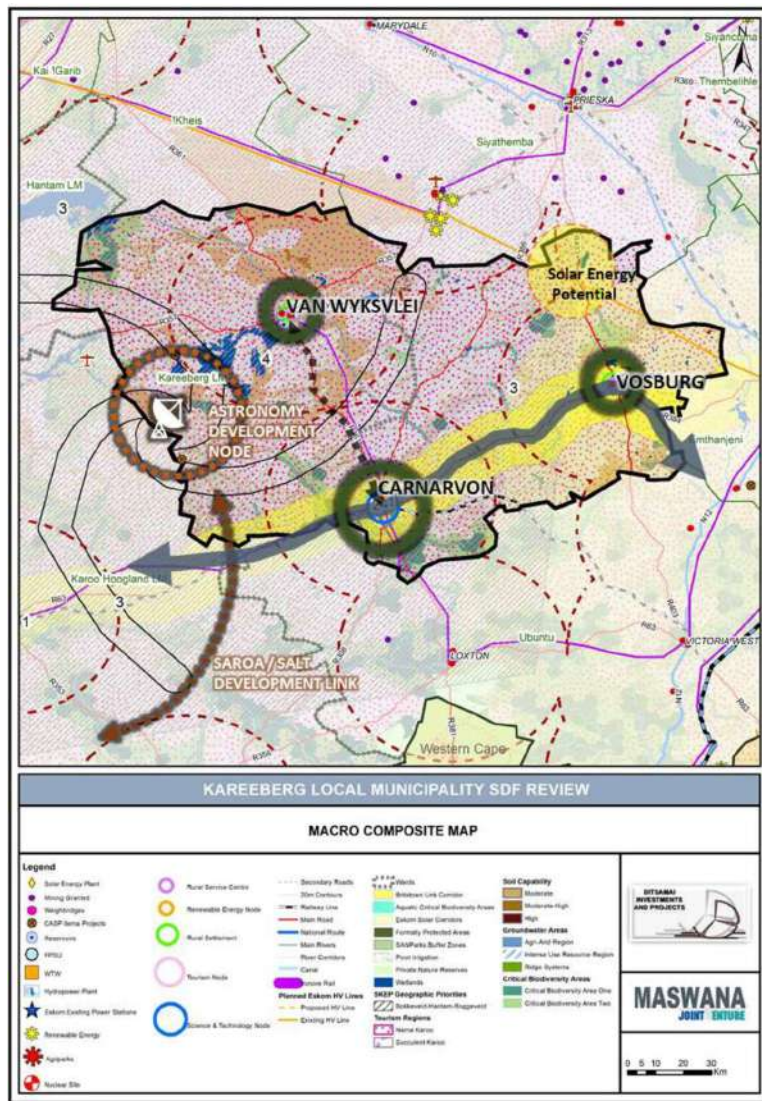


Figure 21: Macro Composite Map for Kareeberg Municipality (Source: Kareeberg SDF, 2019).

14.6.2.1 KEY DEVELOPMENT STRATEGIES

The proposed SKA1_MID project must be considered in context of the overarching four key development strategies identified by the SDF for managing development and land use better, namely:

- **Enhance Local Connectivity:** Promoting Kareeberg as a regional astronomy and tourism hub through strengthening its position within the regional distribution network and unlocking key economic drivers.
- **Protective and conserving local resources:** Recognizing and strengthening the role of natural assets in ecosystem functioning, ecosystem goods and services, the local and regional economy and the livelihood of Kareeberg's residents.
- **Urban and Rural Development:** Facilitating smart growth of Kareeberg's settlements in accordance with their role and potential. Promoting social development, community livelihoods and safety through the sustainable delivery of social facilities, public open space, recreational opportunities and housing.
- **Infrastructure Development:** Capitalising on existing transportation infrastructure and activities to strengthen and diversify the local economy while eradicating services backlogs and creating an environment where all communities are well serviced.

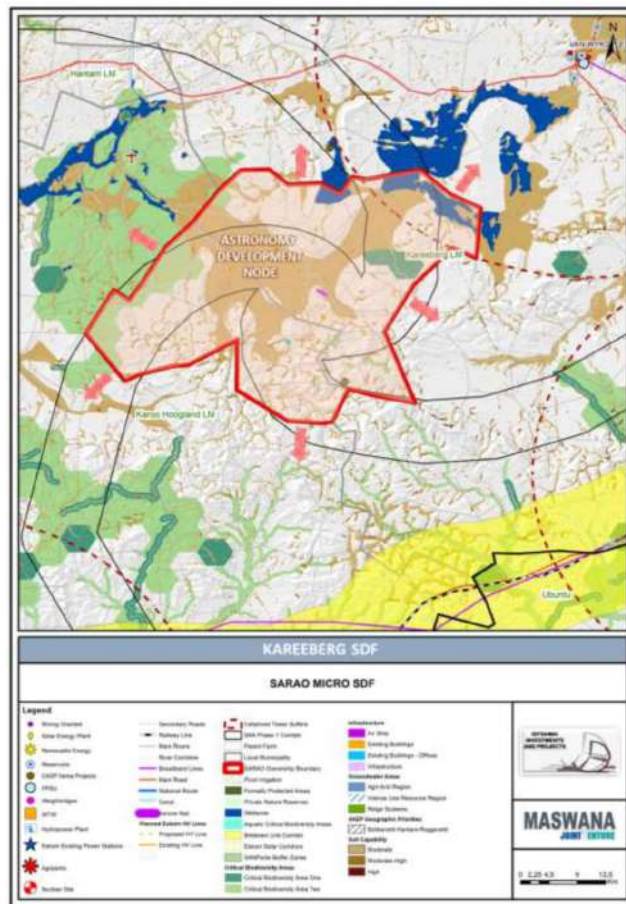


Figure 22: SRAO Micro SDF (Source: Kareeberg SDF, 2019).

14.6.2.2 COMPOSITE MACRO SPATIAL DEVELOPMENT FRAMEWORK

In line with the PSDF the Kareeberg SDF also formulated a Composite Macro Spatial Development Framework as a first step towards a holistic spatial development strategy the Municipality. The Composite model provide spatial direction and context to future developments. The following key initiatives and projects have been identified and included in the composite Macro Framework:

- Refurbishment or road upgrade of the route between Carnarvon & Van Wyksvlei and Van Wyksvlei to Copperton (to increase access and connectivity towards the region);
- Reinforcement of the proposed Tourism route formed from Britstown (N 12) to Carnarvon via Vosburg;
- Development of Wi-Towers to improve accessibility towards economic and knowledge economy opportunities;
- Tourism overnight facilities and accommodation;
- Reinforcement of the Agripark initiatives through the strengthening of the Van Wyksvlei Farmer Production Supporting Unit;
- Development of a Heritage/Tourism Precinct in Carnarvon;
- Development of a Nature Reserve incorporating SKA land; and
- Development of initiation schools or boot camps for the youth.

The Kareeberg SDF specifically identified the Astronomy Development Zone following the direction given by the PSDF (refer to Figure 23 below). According to the Kareeberg SDF development within the SARAO "Urban Edge" will be limited to developments associated with the Astronomy Zone, which could include the following:

- SARAO infrastructure;
- SARAO offices; and
- SARAO accommodation (the accommodation allowed is limited to the permanent staff on site, any other accommodation needs to be provided in Carnarvon).

It is clear that the Kareeberg SDF acknowledges the importance of the proposed SKA1_MID and proposed various strategies and proposals in support thereof. The proposed project therefore satisfy the consistency principle of the PSDF and SDF.

14.7 KAROO HOOGLAND LOCAL MUNICIPALITY

14.7.1 INTEGRATED DEVELOPMENT PLAN

The current fifth generation IDP 2022-2027 is the first review to assess and re-evaluate the municipality's development priorities and challenges and to accommodate new developments in the local governance proses. The IDP encapsulates the completed processes as part of the review of the IDP 2018 to 2019 to the Karoo Hoogland Local Municipalities.

The IDP development process identified a number of goals and objectives that are aimed at creating a pathway for the municipalities to realise its vision. These goals and objectives are aligned to the Local Government Key Performance Areas (KPA's) as prescribed by the National Department of Cooperative Governance and Traditional Affairs (CoGTA).

The IDP also identifies a number of pillars and thrusts, and associated tasks/projects, to bolster the economy. The SKA is considered a major thrust. In this regard, the role that the, amongst others, the SKA play is highlighted and the IDP clearly indicates that new industries like the SALT, SKA, tourism and renewable energy must be supported to try and do a turnaround for the sustainability of the Municipality.

The IDP note that the Karoo Hoogland Municipality is impacted on by all three Karoo Central Radio Astronomy Advantage Areas and although the specific implications for development are currently unknown, the IDP comprehensively recognises the proposed SKA1_MID projects as a "given".

14.7.2 SPATIAL DEVELOPMENT FRAMEWORK

The Karoo Hoogland SDF 2018 – 2023 ("SDF") (Ditsamai Investments and Projects, June 2019) strive to align the needs with capacity, jobs, social services and opportunities. It also recognises the tensions between population dynamics and the economic, ecological and infrastructure capacity of settlements in the local area. The SDF proposals aim to align investment in settlement with these capacities.

The Karoo Hoogland SDF identified similar Key Development Strategies to those identified in the Kareeberg SDF, which strategies provide a conceptual framework around which the more detailed SDF proposals have been developed.

14.7.2.1 KEY DEVELOPMENT STRATEGIES

The proposed SKA1_MID project must be considered in context of the overarching four key development strategies identified by the SDF for managing development and land use better, namely:

- Enhance Local Connectivity: To build on provincial corridors and zones identified in the draft PSDF by investigating further potential that could potentially emanate from the SARAO Astronomy zone, as well as both the Solar and Tourism Corridors.
- Protective and conserving local resources: To ensure integrated management and prioritisation of Karoo Hoogland's natural and man-made cultural landscape resources by taking advantage of the opportunity that the astronomy development holds insofar taking advantage of crystal-clear cloudless skies for tourism related projects.
- Urban and Rural Development: Tourism in the region needs to diversify and not rely too heavily on the floral transformation that takes place during a short window of time, focus should shift to the SALT and Astronomy Opportunities in the area;
- Infrastructure Development: Capitalising on existing transportation infrastructure and activities to strengthen and diversify the local economy while eradicating services backlogs and creating an environment where all communities are well serviced.

14.7.2.2 COMPOSITE MACRO SPATIAL DEVELOPMENT FRAMEWORK

As with the Kareeberg SDF the Karoo Hoogland SDF, in line with the PSDF, also formulated a Composite Macro Spatial Development Framework as a first step towards a holistic spatial development strategy the Municipality. The following key initiatives and projects have been identified and included in the composite Macro Framework:

- Refurbishment or road upgrade of the route between Williston and Fraserburg as well as Williston to Sutherland (to increase tourism access and connectivity towards the region);
- Reinforcement of the proposed Tourism route (triangle) formed between Williston, Fraserburg and Sutherland;
- Development of Wi-Towers to improve accessibility towards economic and knowledge economy opportunities within towns;
- Tourism overnight facilities and accommodation (overlanding, backpackers);

- Establishment of an overnight truck stop in Williston to unlock economic opportunities in the logistics sector as well as reducing the risk of trucks stopping in the main street in Williston overnight;
- Supporting of the Agri Park initiative through the strengthening of the Farmer Production Supporting Units as well as Agro-processing opportunities within the Region;
- Development of a Heritage/Tourism Precinct in Sutherland and Fraserburg;
- Expansion and taking full advantage of the renewable energy (Wind Power) sector south of Sutherland;
- Strengthening conservation linkages with improved signage and other ancillary uses to accommodate tourist towards Tankwa National Park; and
- Development of artisan workshops to provide local population with the chance to develop skills to participate within the economic sectors.

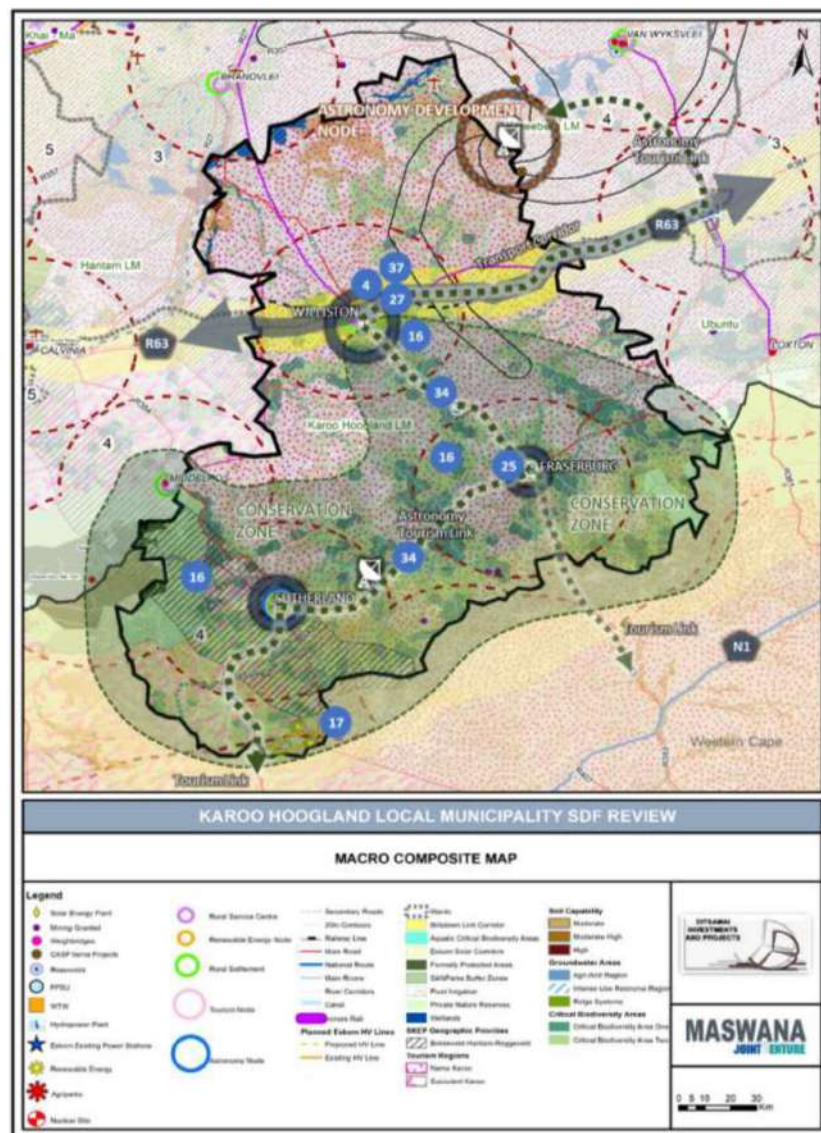


Figure 23: Karoo Hooqland Macro Composite Map (Source: Karoo Hooqland SDF, 2019).

The Karoo Hoogland SDF also identified the Astronomy Development Zone (refer to Figure 24 below). According to the Karoo Hoogland SDF development within the SARAO “Urban Edge” will be limited to developments associated with the Astronomy Zone, which could include the

following:

- SARAO infrastructure;
- SARAO offices; and
- SARAO accommodation (the accommodation allowed is limited to the permanent staff on site, any other accommodation needs to be provided in Carnarvon).

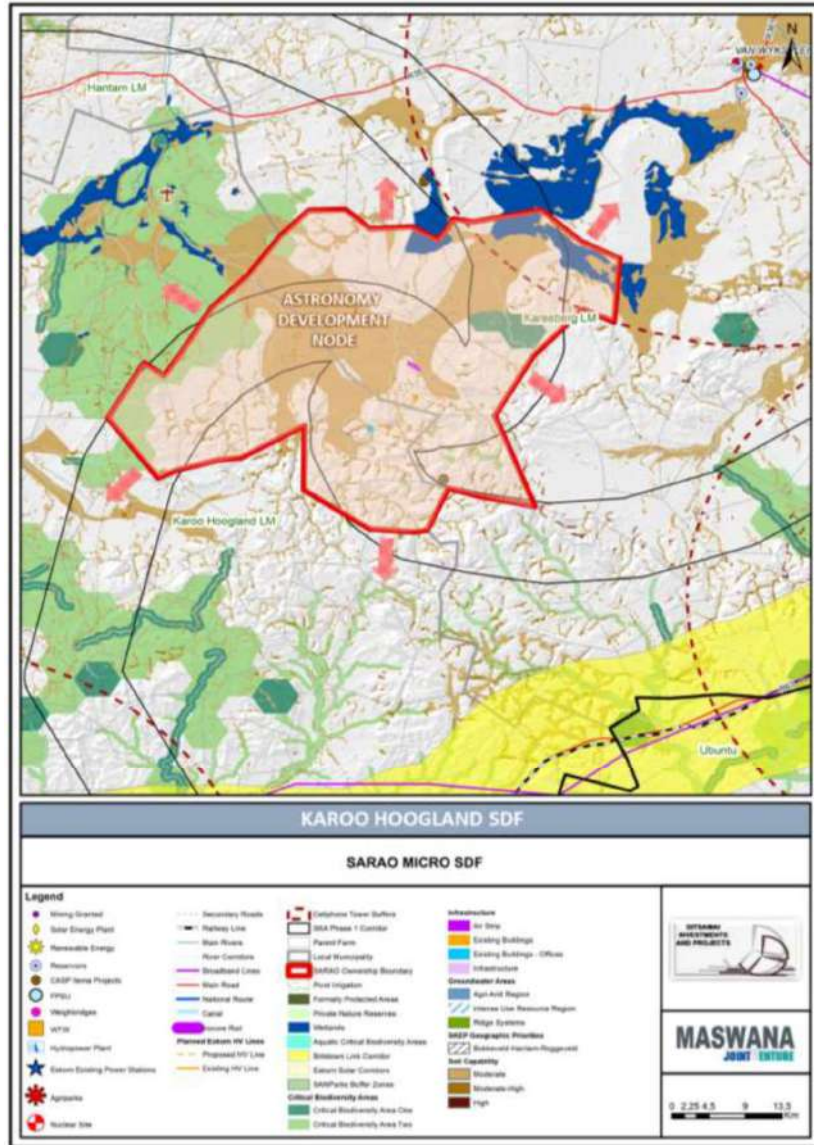


Figure 24: SARAO Micro SDF (Source: Karoo Hoogland SDF, 2019).

It is clear that the Karoo Hoogland SDF acknowledges the importance of the proposed SKA1_MID and proposed various strategies and proposals in support thereof. The proposed project therefore satisfies the consistency principle of the PSDF and SDF.

14.8 HANTAM LOCAL MUNICIPALITY

14.8.1 INTEGRATED DEVELOPMENT PLAN

The Integrated Development Plan (IDP) 2023/2024 of the Hantam Municipality is the first of four reviews of the IDP, which was approved by Council in May 2022, and which documents the current five-year planning and implementation cycle. This five-year cycle started in July 2022 and ends in June 2027.

The IDP lists strategic objectives which were developed to guide how the municipality must respond to its constitutional mandate, and community needs and challenges. The objectives are listed and linked to outcomes and development strategies and aligned with the higher-order performance directives. Various action plans have been developed and projects identified in support of this approach to implementation which is based on the availability of resources. The Municipality has adopted the following five (5) strategic objectives:

- Infrastructure development and basic services.
- Institutional development and municipal transformation
- Economic development
- Municipal financial sustainability and viability
- Good governance and public participation

The IDP recognises the SKA project as a mega project with far-reaching land-use, social, economic and environmental consequences. The IDP recognises and lists the various projects and programmes initiated by the SKA project which is aimed at the socio-economic upliftment of the people of the Hantam District.

14.8.2 SPATIAL DEVELOPMENT FRAMEWORK

The Hantam SDF 2018 – 2023 ("SDF") (Ditsamai Investments and Projects, June 2019) serves as a strategic spatial framework that guides the desired spatial distribution of land uses, spatial priorities and strategic infrastructure provision within the municipality. It also recognises the tensions between population dynamics and the economic, ecological and infrastructure capacity of settlements in the local area. The SDF proposals aim to align investment in settlement with these capacities.

The Hantam SDF identified similar Key Development Strategies to those identified in both the Karoo Hoogland SDF and Kareeberg SDF, which strategies provide a conceptual framework around which the more detailed SDF proposals have been developed.

14.8.2.1 KEY DEVELOPMENT STRATEGIES

The proposed SKA1_MID project must be considered in context of the overarching four key development strategies identified by the SDF for managing development and land use better, namely:

- Enhance Local Connectivity: To build on provincial corridors and zones identified in the draft PSDF by investigating further potential that could potentially emanate from the SARAO Astronomy zone, as well as both the Solar and Tourism Corridors.
- Protection of local resources: Recognizing and strengthening the role of natural assets in ecosystem functioning, ecosystem goods and services, the local and regional economy and livelihood of Hantam's residents.

- Urban and Rural Development: Tourism in the region needs to diversify and not rely too heavily on the floral transformation that takes place during a short window of time.
- Promote Infrastructure Investment: Capitalising on existing transportation infrastructure and activities to strengthen and diversify the local economy while eradicating services backlogs and creating an environment where all communities are well serviced.

14.8.2.2 COMPOSITE MACRO SPATIAL DEVELOPMENT FRAMEWORK

As with the Kareeberg SDF and Karoo Hoogland SDF, the Hantam SDF, in line with the PSDF, also formulated a Composite Macro Spatial Development Framework as a first step towards a holistic spatial development strategy the Municipality. The following key initiatives and projects have been identified and included in the composite Macro Framework:

- Refurbishment or road upgrade of the route between Calvinia and Loeriesfontein as well as Calvinia to Sutherland via Middelpos (to increase tourism access and connectivity towards the region);
- Reinforcement of the proposed Tourism route (triangle) formed between Calvinia, Loeriesfontein and Nieuwoudtville;
- Development of Wi-Towers to improve accessibility towards economic and knowledge economy opportunities;
- Tourism overnight facilities and accommodation (overlanding, backpackers);
- Establishment of an overnight truck stop and weighbridge facilities in Brandvlei to unlock economic opportunities in the logistics sector;
- Reinforcement of the Agripark initiatives through the strengthening of the Nieuwoudtville;
- Farmer Production Supporting Unit as well as Agro-processing opportunities in Calvinia;
- Development of a Heritage/Tourism Precinct in Calvinia;
- Strengthening conservation linkages with improved signage and other ancillary uses to accommodate tourists towards Tankwa National Park as well as Oorlogskloof Nature Reserve; and
- Development of initiation schools or boot camps for the youth.

The Hantam SDF also recognizes the alignment with neighbouring Spatial Development Frameworks. In this regard, the alignment towards the SKA development areas and expansion strategies in both Karoo Hoogland and Kareeberg Municipalities are recognised.

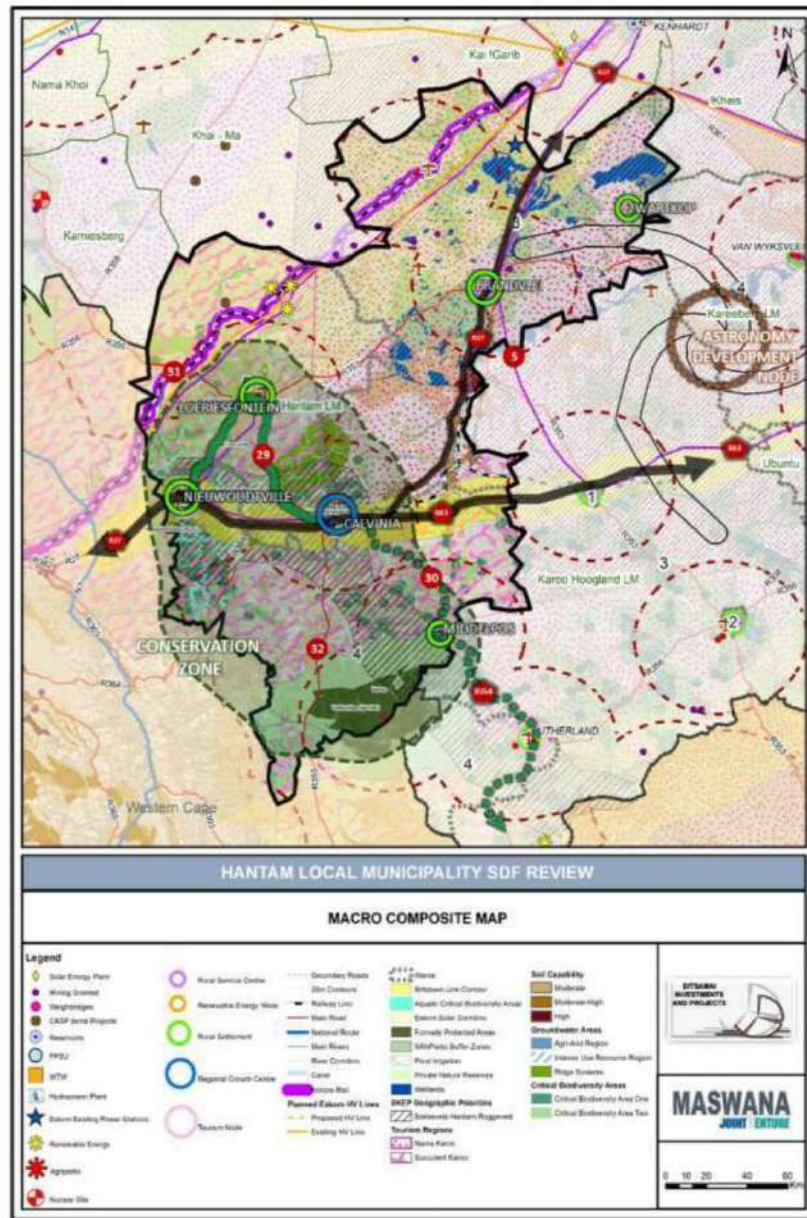


Figure 25: Hantam Macro Composite Map (Source: Hantam SDF, 2019).

Whilst the impact of the SKA project on the Hantam Municipality is not as prominent as it is on the surrounding Karoo Hoogland and Kareeberg municipalities, the SDF still acknowledges the opportunities that the SKA1_MID might bring to the area. The project is therefore consistent with the SDF.

15 LEGISLATIVE CONTEXT

This joint application is submitted and will be considered in terms of the Kareeberg Municipal Planning By-Law, 2015 the Kareeberg Municipal Land Use Scheme, 2022 the Karoo Hoogland Municipal Planning By-Law, 2015 the Karoo Hoogland Municipal Land Use Scheme, 2022 and the Spatial Planning and Land Use Management Act 16 of 2013 ("SPLUMA") read together with the Hantam Land Use Scheme, 2021.

15.1 DEVELOPMENT PRINCIPLES

Chapter 2 of SPLUMA lists development principles and norms and standards that shall apply to spatial planning, land development and land use management. These planning principles are also applicable to this application although one must be mindful that this application is not the "standard" land development proposal but a unique response to South Africa's competitive advantage in astronomy.

15.1.1 SPATIAL JUSTICE

Spatial justice is primarily concerned with the commitment to redress past spatial and other development imbalances. The principle also calls for the inclusion of persons and areas characterised by widespread poverty and deprivation.

The various SDFs and IDPs highlighted the fact that many communities in the area does not have easy access to services and economic opportunities. The proposed SKA1_MID could be utilised as a starting point by providing the local residents with an opportunity to learn a new skill, which would assist in these young people being employable and in turn contribute to the economy of the area. In general, the SKA1_MID would open up a new world of science and technology to an area of South Africa that were previously excluded from large scale projects.

15.1.2 SPATIAL SUSTAINABILITY

Spatial sustainability requires land development to be aligned with fiscal and institutional means. The aim is further to promote land development that is spatially compact, resource frugal and within fiscal, institutional and administrative means of the competent authority.

This translates on the ground to development in locations that are sustainable and that limit urban sprawl, that uphold environmental considerations such as the protection of valuable species, habitats and ecosystems present on site, and that ensures that development is feasible and financially viable as SKA1_MID do.

15.1.3 EFFICIENCY

Efficiency requires land development to optimally use existing resources and infrastructure. The development will insofar engineering services such as water and electricity connect to the existing infrastructure network and will not add additional unwanted pressure on the municipal and national services network.

By submitting this joint application the NRF endeavours to comply with the principle of efficiency which require development application procedures to be efficient and streamlined with timeframes adhered to by all parties.

15.1.4 SPATIAL RESILIENCE

Spatial resilience provides for flexibility in spatial plans, policies and land use management

systems to be accommodated to ensure sustainable livelihoods in communities most likely to suffer the impacts of economic and environmental shocks.

15.1.5 GOOD ADMINISTRATION

This principle primarily places an onus on decision-making authorities to ensure that due process is followed in that legislative and development requirements are met timeously and public consultation is undertaken, and that spatial policy and land use schemes clearly set out the desired spatial form to the public.

SECTION G: CONCLUSION

The SKA1_MID has been recognised and supported from a National to Municipal Sphere. It has been identified as a Strategic Integrated Project in the National Development Plan and recognised and supported by the Northern Cape Spatial Development Framework down to the applicable municipal Integrated Development Plan and Spatial Development Framework. This has been confirmed in a statement issued by Parliament on 12 November 2019 when approving the passing of the Convention Establishing the Square Kilometre Array (SKA) Observatory where it was stated that "Astronomy is one area in which South Africa truly has a competitive advantage and whose benefits include the development of skilled knowledge workers and increased business opportunities to local communities".

The chairperson of the National Planning Commission, Mr. Trevor Manuel, recommended that the planning, approval and implementation of strategic infrastructure developments such as the proposed project require a "business unusual" approach to facilitate efficient implementation. The consideration of this rezoning application by the decision-making authority to enable the construction of the development components herein therefore needs to take a "business unusual" approach.