PROPOSED AGRICULTURAL DEVELOPMENT, PLOT 2435, KAKAMAS SOUTH SETTLEMENT, KAI! GARIB MUNICIPALITY, NORTHERN CAPE

D:E&NC reference number: NC/EIA/02/ZFM/DAW/KAK1/2019

MAY 2019

TRIPLE D FARMS (PTY) LTD

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EXECUTIVE SUMMARY

Introduction

Consideration is being given to the development of approximately 60ha of land with vineyards for table grape and raisin production on Plot 2435 situated in the Kakamas South Settlement. The site is located approximately 2.4km west of the town of Kakamas, in the Kai !Garib Municipality, Northern Cape.

The development will also include the following fixed associated infrastructure:

- a new pump station on the bank of the Orange River,
- pipelines,
- off-stream storage dam (reservoir),
- filtering system.

The proposed pump station and pipelines to the development area will be located within registered servitudes.

The applicant is Triple D Farms (Pty) Ltd who will undertake the activity should it be approved. EnviroAfrica CC has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the relevant EIA and the Public Participation Process required in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA).

The Final Scoping Report and Plan of Study for EIA were submitted to the Department of Environment and Nature Conservation (DENC). The Scoping Report and Plan of Study for EIA were approved by DENC on the 25 April 2019 and EnviroAfrica were advised to proceed with the EIA process.

Environmental Requirements

The National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). These powers are delegated in the Northern Cape to the Department of Environment and Nature Conservation (DE&NC).

On the 04 December 2014 the Minister of Water and Environmental Affairs promulgated regulations in terms of Chapter 5 of the NEMA, namely the EIA Regulations 2014. These were amended on 07 April 2017 (GN No. 326, No. 327 (Listing Notice 1), No. 325 (Listing Notice 2), No. 324 (Listing Notice 3) in Government Gazette No. 40772 of 07 April 2017). Listing Notice 1 and 3 are for a Basic Assessment and Listing Notice 2 for a full Environmental Impact Assessment.

According to the regulations of Section 24(5) of NEMA, authorisation is required for the following listed activities for the proposed agricultural development:

Government Notice R327 (Listing Notice 1) listed activities:

12 The development of;

(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres;

(ii) infrastructure or structures with a physical footprint of 100 square metres or more;

where such development occurs;
(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;
(a) will occur behind a development setback;
(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or
(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.

Government Notice **R325** (Listing notice 2) listed activities:

15 The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for;
(i) the undertaking of a linear activity; or
(ii) maintenance purposes undertaken in accordance with a maintenance management plan.

Government Notice **R324** (Listing notice 3) listed activities:

2 The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.

12 The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.

14 The development of;
(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres;
(ii) infrastructure or structures with a physical footprint of 10 square metres or more;

where such development occurs;
(a) within a watercourse;
(b) in front of a development setback; or
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;
Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

Need and Desirability

Triple D Farms is one of the leading export table grape farms along the Orange River. The company not only contributes to the Northern Cape economy but is also a preferred employer. The development of the property under consideration is therefore crucial to ensure sustainability and further job creation.

The proposed development is expected to have CAPEX value of approximately R22 764 000 on completion. The development is also expected to create approximately 120 jobs opportunities during the construction phase, and 600 jobs opportunities during the operational phase. 100% of the job opportunities will be towards previously disadvantaged individuals, and the expected employment opportunities will have a current value of approximately R48 964 000 during the first 10 years.

The proposed location is considered to be ideal, as it is adjacent to Triple D's existing vineyards and close to the existing Triple D offices and packing shed. The site also has easy and direct access to the N14.

The site is located approximately 1km south of the Orange River, and therefore relatively close to the source of water for irrigation.

An Agricultural development report has been conducted, and the agricultural potential of the property has been mapped. Generally, the site has a medium – low agricultural potential naturally for the cultivation of perennial crops, and will require soil preparation.
The proposed activity and site is compatible with the surrounding area. The area, particularly along the Orange River is known for its agriculture and crop production, particularly grape production (wine, table and raisin grapes). Agriculture is a predominant economic sector in the area.

Site Description

The site is located on Plot 2435 situated in the Kakamas South Settlement, approximately 2.4km west of the town of Kakamas, in the Kai !Garib Municipality, Northern Cape. The proposed pump station is located on the banks of the Orange River, with the general site located approximately 1km south of the Orange River.

The proposed pipeline will run through a registered servitude (please refer to **Appendix 1B**) and will cross below the N14. Please refer to **Appendix 1C** for permission from SANRAL to cross the N14.

The site coordinates for:

- the pumpstation: S 28° 45' 07.73", E20° 35' 15.57".
- the N14 crossing: S 28° 45' 41.01", E20° 35' 07.25".
- Site access from the N14: S 28° 45' 41.02", E20° 35' 05.32".

- Vegetation

The proposed site of the agricultural development is undeveloped, fallow and generally near natural.

According to the Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006, as updated in the 2012 beta version) only one broad vegetation type is expected in the proposed area and its immediate vicinity, namely Bushmanland Arid Grassland.

The vegetation encountered conforms to Bushmanland Arid Grassland. Two definite communities were encountered namely a sparse (semi-desert type) low shrubland with grasses sometimes present

(expected to be more prominent after rain) on the open undulating plains, while a denser and higher riparian vegetation was encountered next to the watercourses.

- Freshwater

There are potentially two watercourses that may be impacted by the proposed development:

- The Orange River
- Drainage line cutting through the property (ephemeral stream)

The Orange River is located approximately 1km north of the main development site. The pump station will be located on the banks of the Orange River, with a pipeline connecting the pumpstation with the main development area. There are existing pumpstations and pipelines in this area.

The Lower Orange River is flanked by numerous drainage lines, which are mostly dry and only contain water during the occasional thunder storm. These drainage lines are a part of the arid landscape. These are nevertheless drainage lines with water flows strong enough to maintain its morphological integrity. These sudden and intense storms occur only occasionally, perhaps once in several years.

The drainage lines are poorly demarcated by vegetation. The scrub and small trees are the same as those further afield away from the drainage lines. Only the stand of higher vegetation is denser around drainage lines. One such drainage line runs through the Triple D property that is now earmarked for development into vineyards.

- Heritage

Locally, scatters of stone artefacts around Kakamas have been reported.

A total of eight incidences of Stone Age material were recorded across the surveyed area. All eight locations are within the northern section of the surveyed area, with one isolated occurrence close to the northern boundary. The lithics are scattered ex situ in low densities along dry riverine and drainage lines, and amongst quartzite surface gravel. The cultural material shows various degrees of weathering and may either be representative of the Early Later Stone Age, or a mere mixture of LSA and MSA artefacts.

No formal or informal graves, and no historical features were identified.

The proposed development is entirely underlain by the Riemvasmaak Gneiss of the Namaqua-Natal Province. The Riemvasmaak Gneiss is an igneous rock type and the potential for any fossil materials occurring within this rock unit is zero.

Alternatives

Alternatives to the proposed development are very limited and have therefore not been considered for the following reasons

- The proposed site is located on a property currently being purchased by Triple D Farms to be further developed for agriculture (grape production). No other feasible site alternatives are therefore available at this stage. The site is ideally situated, due to its proximity to the Orange River for irrigation, the N14 for access, it is adjacent to the existing Triple D agricultural development and offices, and the surrounding area is characterised by similar grape production.

- Activity alternatives are also very limited with no feasible alternatives to assess. Triple D Farms has been involved in table grape production for over 20 years. Agriculture, especially in the form of grape production, is the most prevalent activity in the surrounding area. As discussed earlier, agriculture is also the predominant economic sector in the area, contributing 49% to the formal employment in the Kai !Garib Municipality.

There are therefore no feasible activity alternatives to assess.

No-Go Option - This is the option of not developing the area for grape production. The current status quo will remain. Although this might result in no potential negative environmental impacts, the direct and indirect socio-economic benefits of not developing the site for grape production will not be realised. As described in *Section 2.1*, the jobs opportunities and expected contribution to the region's economy would not be realised.

The no-go option would only be recommended if it were found that the proposed development on this site or in this area might potentially cause substantial detrimental harm to the environment.

Tasks to be undertaken during the EIA Phase

The following tasks must still be undertaken during the EIA phase of the process:

- Compile Draft Environmental Impact Report (EIR) for public comment based on specialist information
- Distribute and/or make the Draft EIR available to registered Interested and Affected Parties for viewing and comment
- Receive comments on Draft EIR. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (EIR).
- Preparation of a FINAL EIR for submission to DENC for consideration and decision-making.

Specialist Studies

The following specialist studies were undertaken as part of this Environmental Impact Assessment:

- Botanical Impact Assessment
- Heritage Impact Assessment
- Freshwater Assessment

Conclusion

The specialist studies and the information provided within the EIA Report, indicates that the proposed Triple D agricultural development does not pose any significant impacts and can be implemented with appropriate mitigation.

In terms of the need and desirability of the proposed development, Triple D Farms is one of the leading export table grape farms along the Orange River. The company not only contributes to the Northern Cape economy but is also a preferred employer. The development of the property under consideration is therefore crucial to ensure sustainability and further job creation.

The proposed development is expected to have CAPEX value of approximately R22 764 000 on completion. The development is also expected to create approximately 120 jobs opportunities during the construction phase, and 600 jobs opportunities during the operational phase. 100% of the job

opportunities will be towards previously disadvantaged individuals, and the expected employment opportunities will have a current value of approximately R48 964 000 during the first 10 years.

The proposed location is considered to be ideal, as it is adjacent to Triple D's existing vineyards and close to the existing Triple D offices and packing shed. The site also has easy and direct access to the N14.The site is located approximately 1km south of the Orange River, and therefore relatively close to the source of water for irrigation.

An Agricultural development report concluded that the site has a medium – low agricultural potential naturally for the cultivation of perennial crops, and would require soil preparation.

In terms of alternatives, the proposed site and the activity are the only viable options for the Applicant at this stage, and as such, no further Alternatives were investigated.

This is the option of not developing the area for grape production. The current status quo will remain. Although this might result in no potential negative environmental impacts, the direct and indirect socio-economic benefits of not developing the site for grape production will not be realised. The job opportunities and expected contribution to the region's economy would not be realised. The no-go option would only be recommended if it were found that the proposed development on this site or in this area might potentially cause substantial detrimental harm to the environment.

According to the Botanical Impact Assessment, the proposed development will result in the transformation of approximately 60 ha of natural vegetation (Least Threatened) within a proposed CBA area. It will also potentially impact on a number of significant water courses and its associated riparian vegetation, as well as 2 *Boscia albitrunca* (Protected in terms of the NFA) and 2 *Aloidendron dichotomum* trees (a red listed plant, and protected in terms of the NCNCA). In addition, it is also likely to impact on a number of other NCNCA plant species.

The development could therefore have a medium/high impact on the environment, but with mitigation it can be reduced significantly to medium/low and is thus very important that the mitigation actions described above are implemented. With the correct mitigation it is likely that the development will then not contribute significantly to any significant loss of vegetation type and associated habitat, loss of ecological processes, loss of local biodiversity and threatened plant species or loss of ecosystem connectivity.

According to the Freshwater Impact Assessment, the planned agricultural expansion would obviously and greatly alter the existing drainage line on site. However, the Triple D drainage line is not important in terms of aquatic habitat, aquatic biodiversity and economic footprint. The envisaged alteration would therefore not be a significant loss. Apart from this, the banks of the Orange River are already heavily exploited, with little habitat that has not been impacted upon in a varying degree. The overall impact on freshwater resources is considered to be Low (with mitigation).

According to the Heritage Impact Assessment, identified archaeological materials are of low significance, as the archaeological sample is small and without context, and therefor of little scientific value. In the development footprint are no archaeological, historical or cultural sites that will be impacted on negatively by the proposed development. Since no archaeological, historical or cultural sites that will be impacted on negatively by the proposed development, the impact of the proposed development on heritage resources is considered negligible.

Considering all the information, it is not envisaged that this proposed Triple D agricultural development will have a significant negative impact on the environment, and the socio-economic benefits are expected to outweigh any negative impacts. The negative impacts can also be mitigated to a satisfactory degree.

It is therefore recommended that the proposed development be supported and be authorised with the necessary conditions of approval, subject to the implementation of the recommended enhancement and mitigation measures contained in Section 12.

CONTENTS

FIGURES

TABLES

APPENDICES

ACRONYMS

BGIS	Biodiversity Geographic Information System
CBA	Critical Biodiversity Area
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DENC	Department of Environment and Nature Conservation (Northern Cape)
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Assessment Report
EMP	Environmental Management Programme
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NID	Notice of Intent to Develop
NWA	National Water Act
OESA	Other Ecological Support Area
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
TIA	Traffic Impact Assessment

1. INTRODUCTION

1.1 BACKGROUND

Consideration is being given to the development of approximately 60ha of land with vineyards for table grape and raisin production on Plot 2435 situated in the Kakamas South Settlement.

The applicant is Triple D Farms (Pty) Ltd who will undertake the activity should it be approved. EnviroAfrica CC has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the relevant EIA and the Public Participation Process required in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA).

The Final Scoping Report and Plan of Study for EIA were submitted to the Department of Environment and Nature Conservation (DENC). The Scoping Report and Plan of Study for EIA were approved by DENC on the 25 April 2019 and EnviroAfrica were advised to proceed with the EIA process.

1.2 SCOPE OF WORK

There has been no particular brief given to the consultants to undertake this study. However, the scope of the study has been determined with reference to the requirements of the relevant legislation and undertaken in terms of the NEMA EIA Regulations 2014, Integrated Environmental Management Information Series on Environmental Impact Reporting (2004) issued by DEAT and the Information Document on Requirements with respect to the EIA Process (January 2003), issued by the Department of Environmental Affairs and Development Planning of the Western Cape.

The basic scope of work will include the following:

- Review of all information.
- Participating in the progress of the development proposal.
- Scoping (identification of significant issues).
- Assessment of anticipated impacts.
- Identification of suitable mitigation measures to reduce negative impacts and enhance positive impacts.
- Submission for decision.

One of the crucial aims of an EIA is to ensure that the demands of sustainable development are met on a project level, within the context of the greater area. The most common definition of sustainable development is development that meets the needs of the present while not compromising the needs of future generations.

This EIA is therefore being undertaken with sustainable development as a goal. The assessment will look at the impacts of the proposals on the environment and assess the significance of these, as well as propose mitigation measures, as required, to reduce anticipated impacts to acceptable levels.

1.3 ASSUMPTIONS AND LIMITATIONS

The assumption is made that the information on which the report is based (i.e. specialist studies and project information) is correct.

Future management of the site is essential, and the assumption is made that the mitigation measures recommended by the specialists will be implemented on a long-term basis. This has a major bearing on the reliability of the predictions of significance of impact.

1.4 DESCRIPTION OF THE PROPOSED ACTIVITY

It is proposed that approximately 60ha of land be developed with vineyards for table grape and raisin production on Plot 2435 situated in the Kakamas South Settlement. The development will also include the following fixed associated infrastructure:

- a new pump station on the bank of the Orange River,
- pipelines,
- off-stream storage dam (reservoir),
- filtering system.

The proposed pump station and pipelines to the development area will be located within registered servitudes.

The site is located approximately 2.4km west of the town of Kakamas, in the Kai !Garib Municipality, Northern Cape. The proposed pump station is located on the banks of the Orange River, with the general site located approximately 1km south of the Orange River. According to Kai !Garib Municipality Draft IDP (2018/19), the Orange River played an enormous role in the formation of the municipal area and most of the towns and settlements are to be found close to or adjacent thereto. The economy is heavily depended on the Agricultural Sector, both intensive and extensive.

The area is known for crop production, particularly wine, table and raisin grapes. Agriculture is a predominant economic sector in the area, contributing 49% to the formal employment in the Kai !Garib Municipality. According to the Kai !Garib Municipality Draft IDP (2018/19), the agricultural sector is still the main economic sector who made the biggest contribution to the economy of Kai !Garib in 2010.The Agriculture sector is also a major employer in the Municipality in terms of all formal employment. According to Statistics South Africa (Census 2011) about 399 of the households work on crops only; 1382 on livestock only; 222 on mix farming and 69 on other farming methods. It is also the sector with the largest potential for economic growth. The commercial farmers farm especially with grapes for export, raisins and wine, while citrus types of fruit are also becoming more prevalent in the area.

Site co-ordinates: Proposed pump station: 28^{o} 45’ 07.89” S, 20^{o} 35’ 15.73” E.

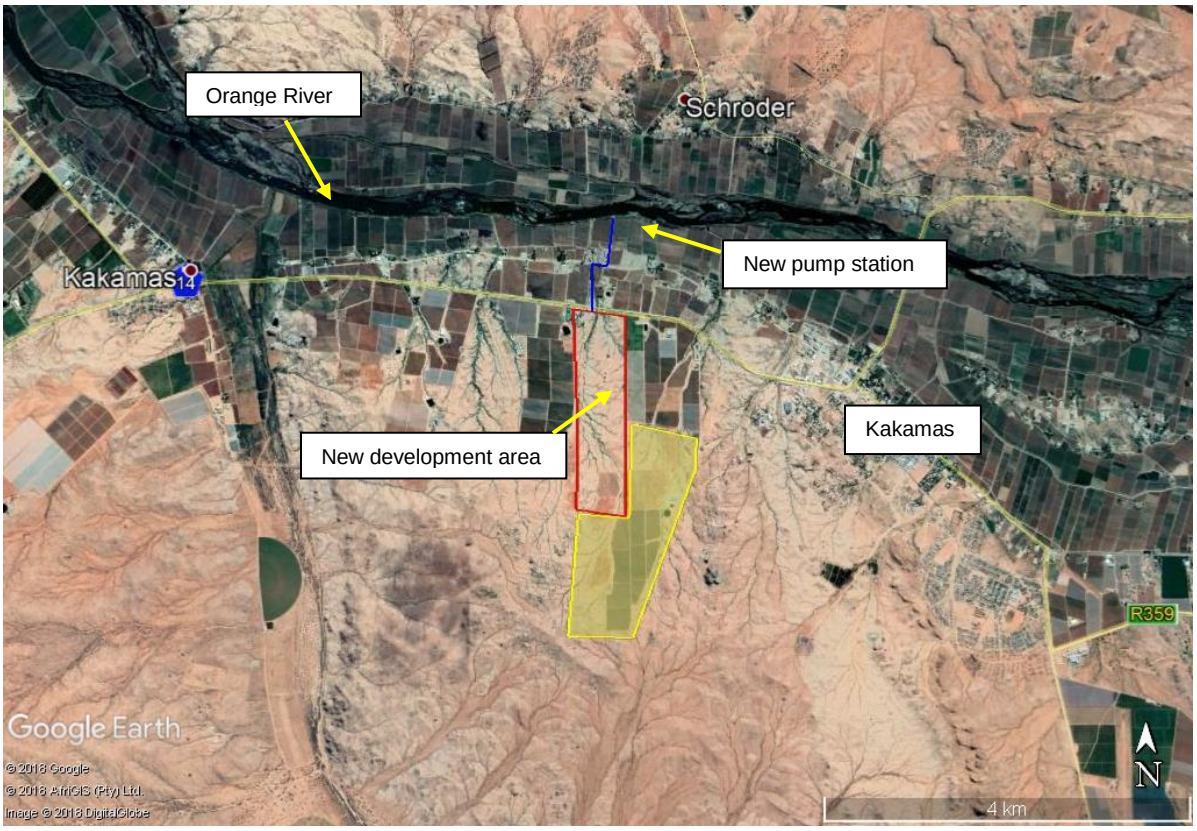

Figure 1: Locality Plan.

2. NEED AND DESIRABILITY

In terms of the National Environmental Management Act, as amended, EIA 2014 regulations the Scoping/EIA report must provide a description of the need and desirability of the proposed activity. The consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest.

While the concept of need and desirability relates to the *type* of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which *need* refers to *time* and *desirability* to *place* – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to *wise use of land* – i.e. the question of what is the most sustainable use of land. The impact of development on people's health and well-being, as well as its impact on natural and cultural areas, and therefore its desirability, will also be assessed during the Environmental Impact Report phase.

2.1 NEED

Triple D Farms is one of the leading export table grape farms along the Orange River. The company not only contributes to the Northern Cape economy but is also a preferred employer. The development of the property under consideration is therefore crucial to ensure sustainability and further job creation.

The proposed development is expected to have CAPEX value of approximately R22 764 000 on completion. The development is also expected to create approximately 120 jobs opportunities during the construction phase, and 600 jobs opportunities during the operational phase. 100% of the job opportunities will be towards previously disadvantaged individuals, and the expected employment opportunities will have a current value of approximately R48 964 000 during the first 10 years.

2.2 DESIRABILITY

The following factors determine the desirability of the area for the proposed agricultural development.

2.2.1 LOCATION AND ACCESSIBILITY

The proposed location is considered to be ideal, as it is adjacent to Triple D's existing vineyards and close to the existing Triple D offices and packing shed. The site also has easy and direct access to the N14.

The site is located approximately 1km south of the Orange River, and therefore relatively close to the source of water for irrigation.

An Agricultural development report (**Appendix 3A**) has been conducted, and the agricultural potential of the property has been mapped (see **Appendix 3B**). Generally, the site has a medium – low agricultural potential naturally for the cultivation of perennial crops, and will require soil preparation.

2.2.2 COMPATIBILITY WITH THE SURROUNDING AREA

The proposed activity and site is compatible with the surrounding area. The area, particularly along the Orange River is known for its agriculture and crop production, particularly grape production (wine, table and raisin grapes). Agriculture is a predominant economic sector in the area.

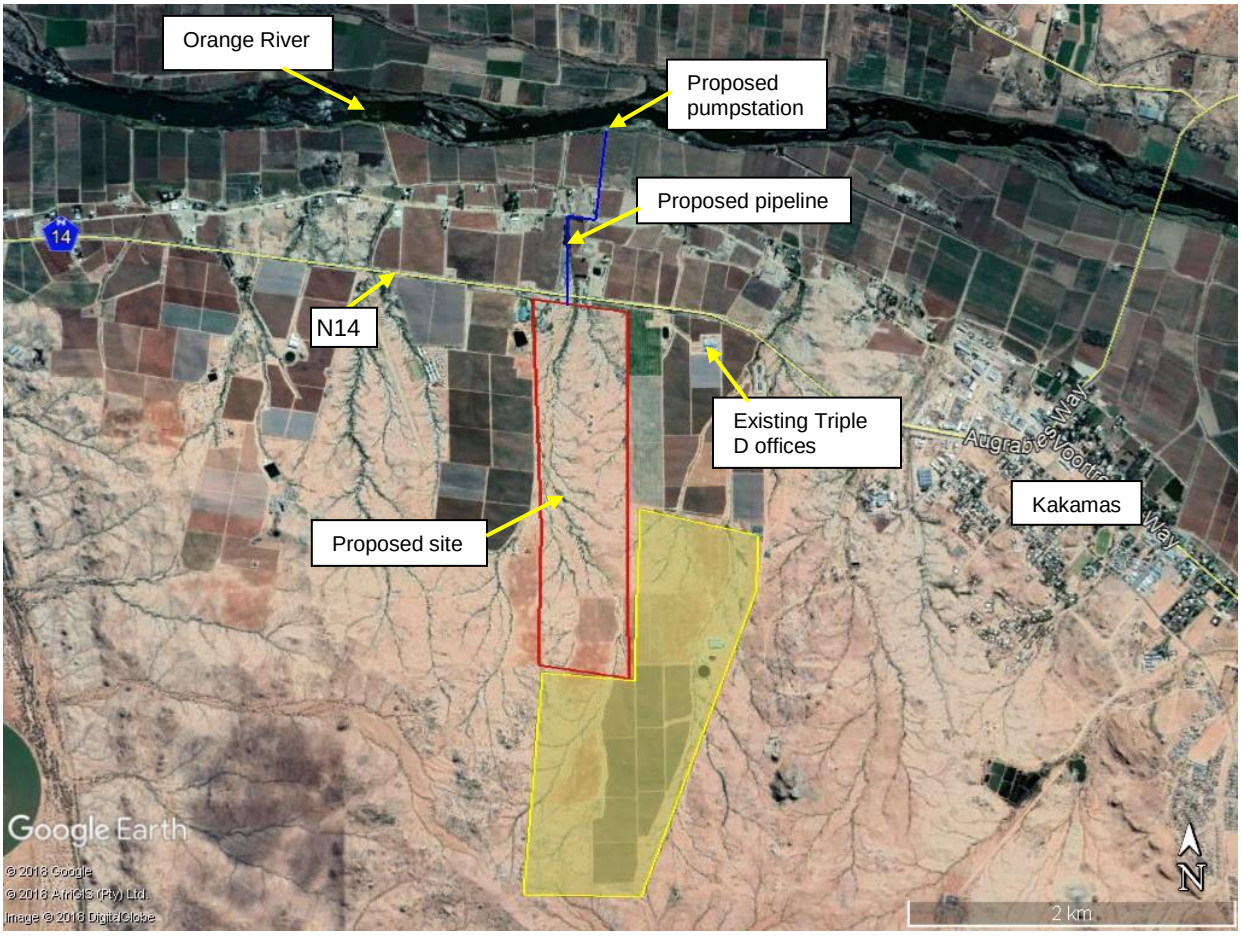

Figure 2: Google Earth image of the surrounding landscape. The predominant agricultural sector, especially along the Orange River, and surrounding the proposed site is clearly evident.

3. LEGAL REQUIREMENTS

The current assessment is being undertaken in terms of the National Environmental Management Act (Act 107 of 1998, NEMA), to be read with section 24 (5): NEMA EIA Regulations 2010. However, the provisions of various other Acts must also be considered within this EIA.

The legislation that is relevant to this study is briefly outlined below.

3.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA

The Constitution of the Republic of South Africa (Act 108 of 1996) states that everyone has a right to a non-threatening environment and that reasonable measure are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

The National Environmental Management Act (Act 107 of 1998) (NEMA), as amended, makes provision for the identification and assessment of activities that are potentially detrimental to the environment and which require authorisation from the relevant authorities based on the findings of an environmental assessment. NEMA is a national act, which is enforced by the Department of Environmental Affairs (DEA). These powers are delegated in the Northern Cape to the Department of Environment and Nature Conservation (DE&NC).

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where such development occurs;

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(a) will occur behind a development setback;

(b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or

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Government Notice **R325** (Listing notice 2) listed activities:

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(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;

Excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

The environmental process is being undertaken in distinct phases, refer to **Figure 3**.

An Application Form has been submitted to Department of Environment and Nature Conservation (DE&NC). On acknowledgment from DE&NC (**Appendix 1A**), the Scoping Process was undertaken to identify potential issues.

The Final Scoping Report and Plan of Study for EIA were submitted to the Department of Environment and Nature Conservation (DE&NC). The Scoping Report and Plan of Study for EIA were approved by DE&NC and EnviroAfrica was advised to proceed with the EIA process.

The principles of environmental management as set out in section 2 of NEMA have been taken into account. The principles pertinent to this activity include:

- People and their needs will be placed at the forefront while serving their physical, psychological, developmental, cultural and social interests. The activity seeks to provide additional employment and economic development opportunities, which are a local and national need – *the proposed activity is expected to have a beneficial impact on people, especially developmental and social benefits, as well providing additional employment and economic development opportunities.*
- Development will be socially, environmentally and economically sustainable. Where disturbance of ecosystems, loss of biodiversity, pollution and degradation, and landscapes and sites that constitute the nation's cultural heritage cannot be avoided, are minimised and remedied. The impact that the activity will potentially have on these will be considered, and mitigation measures will be put in place - *potential impacts have been identified and considered, and any further potential impacts will be identified during the public participation process. Mitigation measures have been recommended by the various specialist assessment, and are included in the EMP*.
- Where waste cannot be avoided, it will be minimised and remedied through the implementation and adherence of the Environmental Management Programme (EMP) – *the EMP is included in the EIR*.
- The use of non-renewable natural resources will be responsible and equitable.
- The negative impacts on the environment and on people's environmental rights will be anticipated, investigated and prevented, and where they cannot be prevented, will be minimised and remedied – *potential negative impacts have been identified and considered, and any further potential impacts will be identified during the public participation process. Mitigation measures have been recommended by the various specialist assessment, and are included in the EMP*.
- The interests, needs and values of all interested and affected parties will be taken into account in any decisions through the Public Participation Process – *refer to Section 7.2 below and Appendix 2*.
- The social, economic and environmental impacts of the activity will be considered, assessed and evaluated, including the disadvantages and benefits - *refer to Section 10 below*
- The effects of decisions on all aspects of the environment and all people in the environment will be taken into account, by pursuing what is considered the best practicable environmental option.

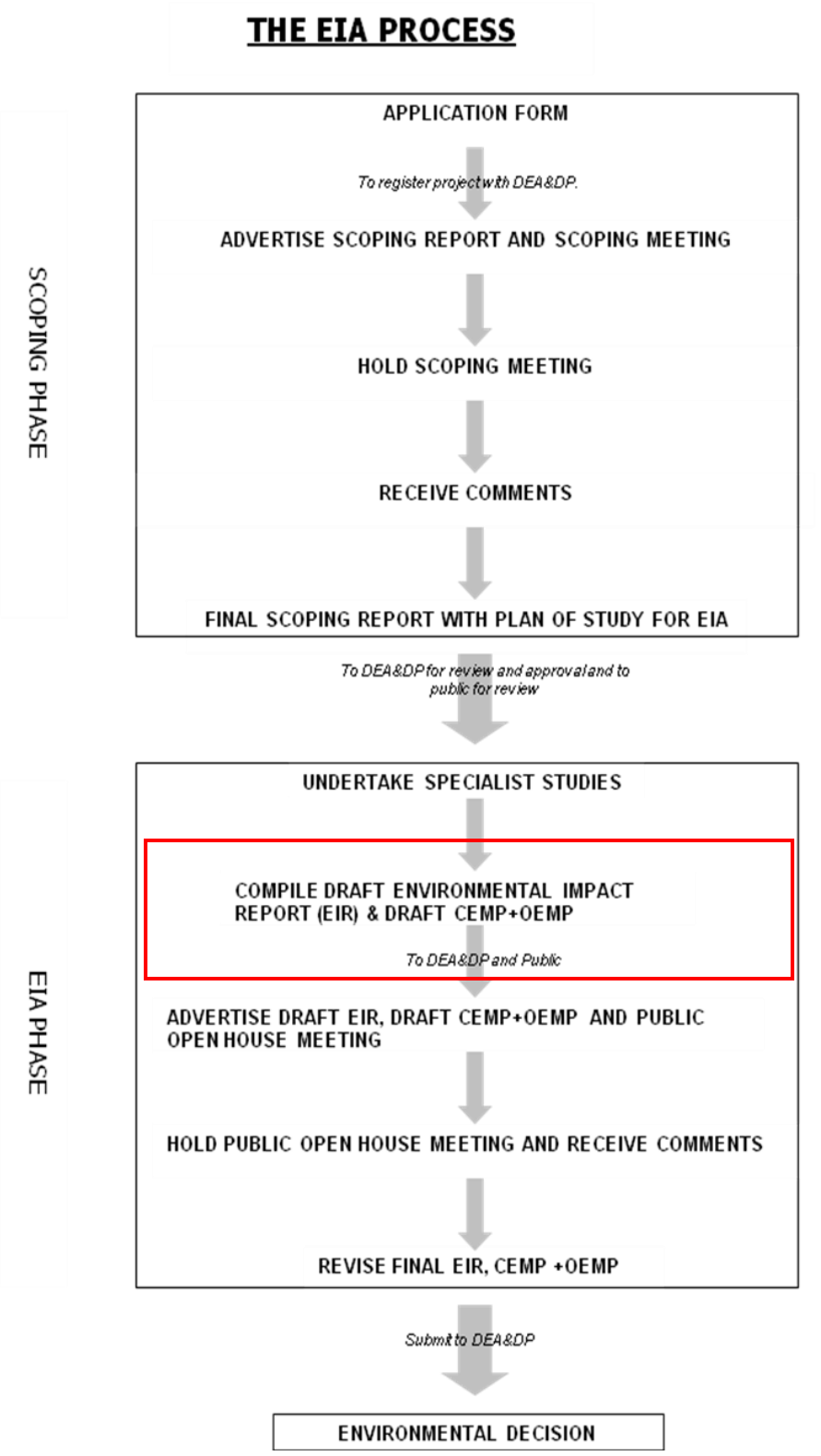

Figure 3: The EIA Process. Currently, this process is in the 'EIA Phase – Compile Draft Environmental Impact Report (EIR) and draft EMP, as indicated in red.

3.3 NATIONAL HERITAGE RESOURCES ACT

The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999). South African National Heritage Resources Agency (SAHRA) is the enforcing authority.

In terms of Section 38 of the National Heritage Resources Act, SAHRA will require a Heritage Impact Assessment (HIA) where certain categories of development are proposed. Section 38(8) also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is found to be adequate, a separate HIA is not required.

The National Heritage Resources Act requires relevant authorities to be notified regarding this proposed development, as the following activities are relevant:

- *any development or other activity which will change the character of a site exceeding 5 000 m² in extent;*
- *the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length*

Furthermore, in terms of Section 34(1), no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit issued by the SAHRA, or the responsible resources authority. Nor may anyone destroy, damage, alter, exhume or remove from its original position, or otherwise disturb, any grave or burial ground older than 60 years, which is situated outside a formal cemetery administered by a local authority, without a permit issued by the SAHRA, or a provincial heritage authority, in terms of Section 36 (3). In terms of Section 35 (4), no person may destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object, without a permit issued by the SAHRA, or the responsible resources authority.

3.4 EIA GUIDELINE AND INFORMATION DOCUMENT SERIES

The following are the latest guidelines and information Documents that have been consulted:

- Department of Environmental Affairs and Development Planning's (DEA&DP) *Environmental Impact Assessment Guideline and Information Document Series (Dated: March 2013)*:
  - ✓ *Guideline on Transitional Arrangements*
  - ✓ *Generic Terms of Reference for EAPs and Project Schedules*
  - ✓ *Guideline on Alternatives*
  - ✓ *Guideline on Public Participation*
  - ✓ *Guideline on Exemption Applications*
  - ✓ *Guideline on Appeals*
  - ✓ *Guideline on Need and Desirability*

- Department of Environmental Affairs and Tourism (DEAT*) Integrated Environmental Management Information Series.*

3.5 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is part of a suite of legislation falling under NEMA, which includes the Protected Areas Act, the Air Quality Act, the Integrated Coastal Management Act and the Waste Act. Chapter 4 of NEMBA deals with threatened and protected ecosystems and species and related threatened processes and restricted activities. The need to protect listed ecosystems is addressed (*Section 54*).

3.6 NATIONAL FORESTS ACT

The National Forests Act, 1998 (Act 84 of 1998) (NFA) makes provisions for the management and protection of forests, as well as specific tree species.

According to the Botanical Assessment (**Appendix 5A**), there is only one tree species protected in terms of the NFA that was observed on the site. These will be discussed and assessed in Section 10.1.

In terms of section 15(1) of the National Forests Act, 1998, no person may -

(a) cut, disturb, damage or destroy any protected tree; or

(b) posses, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except-

  (i) under a license granted by the Minister; or

  (Ii) in terms of an exemption from the provisions of this subsection published by the Minister in the Gazette.

3.7 NORTHERN CAPE CONSERVATION ACT, ACT 09 OF 2009

On the 12th of December 2011, the new Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) came into effect, which provides for the sustainable utilization of wild animals, aquatic biota and plants. Schedule 1 and 2 of the Act give extensive lists of specially protected and protected fauna and flora species in accordance with this act. The NCNCA is a very important Act in that it put a whole new emphasis on a number of species not previously protected in terms of legislation.

It also put a new emphasis on the importance of species, even within vegetation classified as “Least Threatened” (in accordance with GN 1002 of 9 December 20011, promulgated in terms of the National Environmental Management Biodiversity Act 10 of 2004). Thus, even though a project may be located within a vegetation type or habitat previously not considered under immediate threat, special care must still be taken to ensure that listed species (fauna & flora) are managed correctly.

A number of species protected in terms of the NCNCA were encountered on site. These will be discussed and assessed in Section 10.1.

3.8 NATIONAL WATER ACT

Besides the provisions of NEMA for this EIA process, the proposed development also requires authorizations under the National Water Act (Act N0. 36 of 1998). The Department of Water and Sanitation (DWS), who administer that Act, will be a leading role-player in the EIA.

The proposed development "triggers" sections of the National Water Act. These are the following:

- S21 (c) - *Impeding or diverting the flow of a water course*
  The proposed development is spanning the banks of a drainage line. The drainage line would be altered, should the development go ahead.

- S21 (i) - *Altering the bed, bank, course of characteristics of a water course.*
  Some part of the proposed development will alter the characteristics of the banks of the drainage line.

A Water Use Licence Application (WULA) has been compiled and has been submitted to DWS.

Government Notice 509 of 26 August 2016 is also applicable to the development:

- An extensive set of regulations that apply to any development in a water course is listed in this government notice in terms of Section 24 of the NWA. No development take place within the 1:100 year-flood line without the consent of the DWS. If the 1:100-year flood line flood line is not known, no development may take place within a 100m from a water course without the consent of the DWS.

4. ALTERNATIVES

Alternatives to the proposed development are very limited and have therefore not been considered for the following reasons described below.

4.1 SITE ALTERNATIVES

The proposed site is located on a property currently being purchased by Triple D Farms to be further developed for agriculture (grape production). No other feasible site alternatives are therefore available at this stage. The site is ideally situated, due to its proximity to the Orange River for irrigation, the N14 for access, it is adjacent to the existing Triple D agricultural development and offices, and the surrounding area is characterised by similar grape production.

4.2 ACTIVITY ALTERNATIVES

Activity alternatives are also very limited with no feasible alternatives to assess. Triple D Farms has been involved in table grape production for over 20 years. Agriculture, especially in the form of grape production, is the most prevalent activity in the surrounding area. As discussed earlier, agriculture is also the predominant economic sector in the area, contributing 49% to the formal employment in the Kai !Garib Municipality.

There are therefore no feasible activity alternatives to assess.

4.3 NO-GO ALTERNATIVE

This is the option of not developing the area for grape production. The current status quo will remain. Although this might result in no potential negative environmental impacts, the direct and indirect socio-economic benefits of not developing the site for grape production will not be realised. As described in *Section 2.1*, the jobs opportunities and expected contribution to the region's economy would not be realised.

The no-go option would only be recommended if it were found that the proposed development on this site or in this area might potentially cause substantial detrimental harm to the environment.

5. SITE DESCRIPTION

5.1 LOCATION

The site is located on Plot 2435 situated in the Kakamas South Settlement, approximately 2.4km west of the town of Kakamas, in the Kai !Garib Municipality, Northern Cape. The proposed pump station is located on the banks of the Orange River, with the general site located approximately 1km south of the Orange River.

The proposed pipeline will run through a registered servitude (please refer to **Appendix 1B**) and will cross below the N14. Please refer to **Appendix 1C** for permission from SANRAL to cross the N14.

The site coordinates for:

- the pumpstation: S 28º 45' 07.73", E20º 35' 15.57".
- the N14 crossing: S 28º 45' 41.01", E20º 35' 07.25".
- Site access from the N14: S 28º 45' 41.02", E20º 35' 05.32".

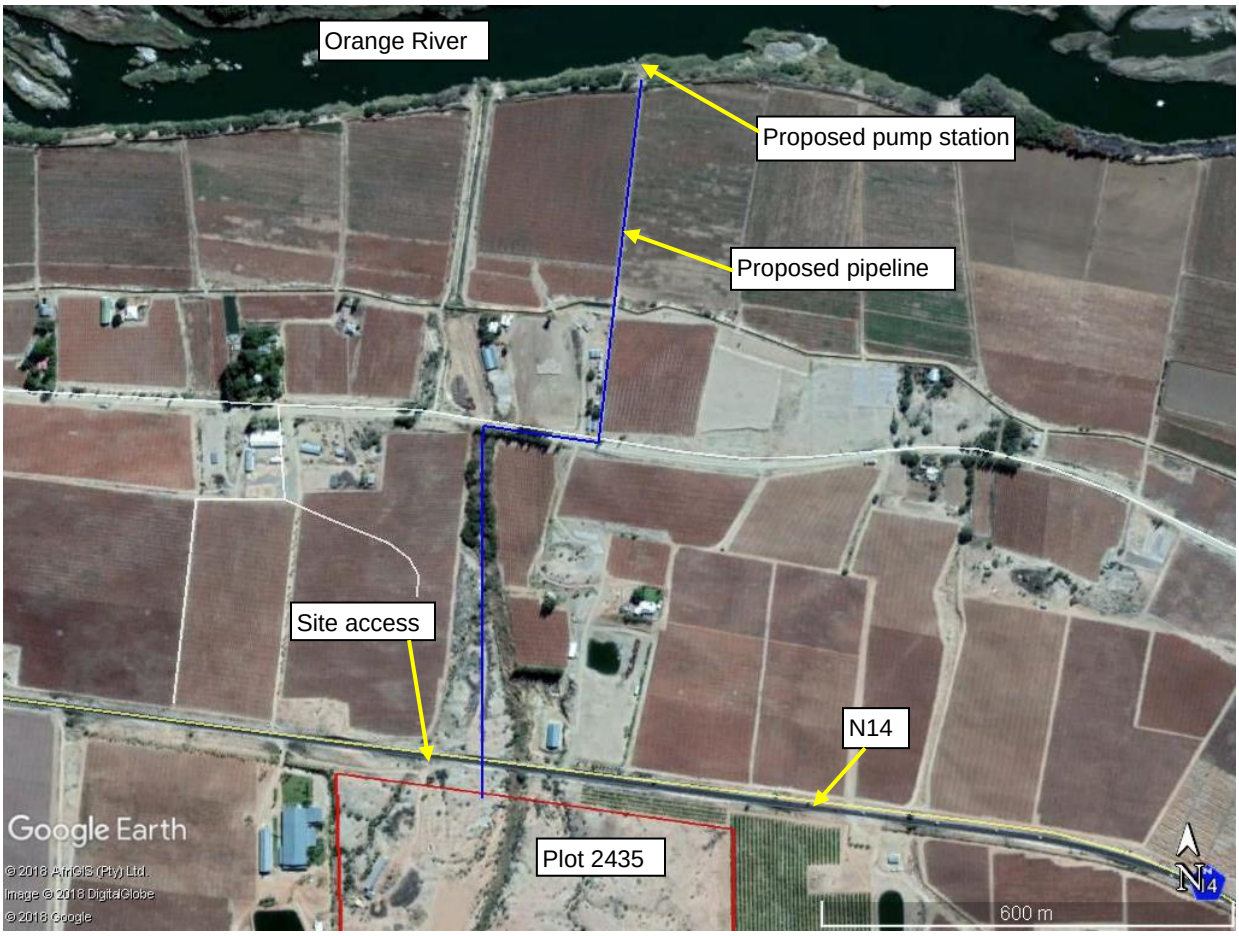

Figure 4: Google Earth Aerial image of the site.

Figure 5: General view of the proposed pumpstation site on the banks of the Orange River. Note existing pumpstations.

Figure 6: General view of part of the pipeline route (along the existing track). This is located within a registered servitude. Also note the existing vineyards, typical of the dominant land-use of the area.

Figure 7: General view of part of the pipeline route approaching the N14. The pipeline will cross under the N14.

Figure 8: General view of the site, looking South-east from the access road. The N14 can be seen to the left of the image, as well as current grape production on adjacent farms.

5.2 VEGETATION

The proposed site of the agricultural development is undeveloped, fallow and generally near natural.

According to the Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006, as updated in the 2012 beta version) only one broad vegetation type is expected in the proposed area and its immediate vicinity, namely Bushmanland Arid Grassland.

The vegetation encountered conforms to Bushmanland Arid Grassland. Two definite communities were encountered namely a sparse (semi-desert type) low shrubland with grasses sometimes present (expected to be more prominent after rain) on the open undulating plains, while a denser and higher riparian vegetation was encountered next to the watercourses.

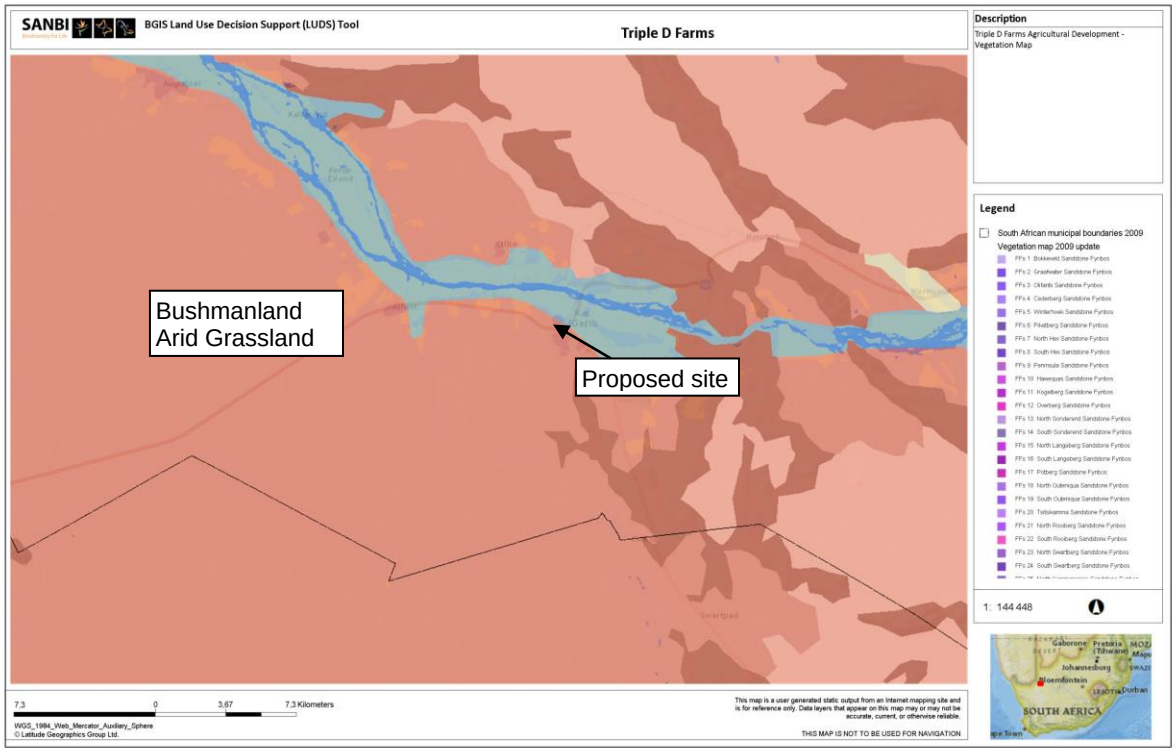

Figure 9: SANBI Vegetation map of the area.

5.3 FRESHWATER

There are potentially two watercourses that may be impacted by the proposed development:

- The Orange River
- Drainage line cutting through the property (ephemeral stream)

The Orange River is located approximately 1km north of the main development site. The pump station will be located on the banks of the Orange River, with a pipeline connecting the pumpstation with the main development area. There are existing pumpstations and pipelines in this area.

According to the Freshwater Report (**Appendix 5C**), the Lower Orange River is flanked by numerous drainage lines, which are mostly dry and only contain water during the occasional thunder storm. These drainage lines are a part of the arid landscape. These are nevertheless drainage lines with water flows strong enough to maintain its morphological integrity. These sudden and intense storms occur only occasionally, perhaps once in several years.

The drainage lines are poorly demarcated by vegetation. The scrub and small trees are the same as those further afield away from the drainage lines. Only the stand of higher vegetation is denser around drainage lines. One such drainage line runs through the Triple D property that is now earmarked for development into vineyards.

Benches and terraces are generally ill defined or absent, with only a wide floodplain in which transported material has been deposited as is the Triple D drainage line higher up the sub-catchments. It is pronounced and incised lower down closer to the trunk road.

There are two smaller drainage lines towards the west between the Triple D property and the Hartbees River.

The drainage line passes under the N14, where is becomes more formalised. The N14 cuts the sub-catchment off from its natural confluence with the Orange River. From the N14 trunk road the drainage line has been partially formalised and where it flows through the vineyards along the Orange River, it has been channelled into a straight furrow.

In the drainage lines, on the riparian zones, the dominant tree is swarthaak *Senegalia mellifera*. The vegetation here can be higher than that of the surrounding land, which provides habitat to a variety of organisms that would not have been present, were it not for these drainage lines. The drainage line on the proposed new development does not bear testimony of this taller vegetation and therefore does not contribute to this form of varied habitat.

5.4 SOIL POTENTIAL

According to the Soil Potential and Agricultural Development Report (**Appendix 4A**), the dominant soil types in the area are the Glenrosa and Brandvlei soils (Medium-Low soil potential), and Mispah, Coega and Glenrosa soil (Low soil potential).

According to the Agricultural Development Report (**Appendix 4A**), the overall classified soil for the proposed development area has a Medium-Low agricultural potential in its natural state, and will require correct irrigation practices and scheduling.

5.5 CLIMATE

Kakamas is in an arid climate. Kakamas normally receives about 62mm of rain per year, with most rainfall occurring mainly during autumn. It receives the lowest rainfall (0mm) in June and the highest (19mm) in March.

The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Kakamas range from 20°C in July to 33°C in January. The region is the coldest during July when the temperature drops to 3.1°C on average during the night.

5.6 SOCIO-ECONOMIC CONTEXT

According to the Kai !Garib Municipality Draft Integrated Development Plan (IDP)(March 2015), the Orange River is the life vain of this Community and on both sides of the river, green cultivated land occurs, forming the largest economic base of this area. The Orange River is further the biggest driving force behind the whole area, causing economic activities in the area over the last two decades to have expanded greatly along the river. The main towns of Kakamas and Keimoes are situated in the midst of an intensive Irrigation Farming Community stretching from Groblershoop in the east up to Blouputs in the west. Farming includes crops like vineyards, pecannut- and citrus plantations. Local areas where these types of farming flourishes include Blouputs, Eksteenskuil, Riemvasmaak and Cannon Island.

According to Stats SA Census 2011, the total population of Kai !Garib Municipality was 65 869, with the Kakamas area (ward) making up 9 317 of the total population.

According to the Kai !Garib Municipality Draft IDP, the following Stats needs are important to highlight:

1. The working age demographic (age 15 to 65) in Kai !Garib made up 70.5% of the population.
2. The official unemployment rate in Kai !Garib population is 10.0 % (In comparison to 16.1 % in 2011 the unemployment decrease with 6.1% which is positive “+”)
3. Education: No Schooling – 9.0 % (14.7 % in 2001 = decrease with 5%). Higher Education – 3.9 % (3.7 % in 2001 = increase with 0.2 %) Matric – 15.5 % (11.2 % in 2001 = increase with 4%) (Source: Stats SA).

The Census 2011 indicate a positive grow in Kai !Garib Municipal area. However the municipality cannot ignore the fact that most of the residents of Kai !Garib municipal area live in less favourable conditions. The income distribution is distorted to the disadvantage of the less economically secured people, who also represents the majority group in the Municipal Area. Many residents of Kai !Garib Municipality still battle the same issues as 15 years back, lack of housing, lack of ownership of property and a lack of proper education.

According to the Kai !Garib Municipality Draft IDP, the agricultural sector is still the main economic sector making up the biggest contribution (51.8 %) to the economy of Kai !Garib in 2010. The Agriculture sector is also a major employer in the Municipality, providing 66.5% of all formal employment. It is also the sector with the largest potential for economic growth. The commercial farmers farm especially with grapes for export, raisins and wine, while citrus types of fruit are also becoming more prevalent in the area.

There are also three wine cellars in the area at Keimoes, Kakamas and Kanoneiland. High quality table wine is produced at these wine cellars, as well as quality grape juice. Several permanent jobs are created through these wine cellars. Two major Raison export companies also established in Kai !Garib Area.

The emerging farmers focus more on small stock farming, lucern, cotton, corn, and nuts which are cultivated under irrigation from the Orange River. Kenhardt area is more known for small stock farming especially the dorper sheep. Abattoirs are available at Kenhardt and Kakamas.

Major constraints for agricultural development include poor quality of access roads to and from farms, farming skills amongst the youth and finances for emerging farmers. Opportunities in the agricultural sector include the expansion of the production of Lucern and citrus fruits as well as the possible

establishment of ostrich farming. Other sectors that show potential within the sector is agri-tourism which is not investigated or explored as yet.

5.7 HERITAGE FEATURES

According to the Heritage Impact Assessment (**Appendix 5B**), the Northern Cape is rich in archaeological sites and landscapes that reflect the complex South African heritage from the Stone Age to Colonial history.

Within the region, Stone Age sites and complexes have been, and are still being investigated in some detail. This includes, but are not limited to, the landscape near Kathu, where numerous Stone Age sites have been documented and excavated, representing the longest preserved lithostratigraphic and archaeological sequence of human occupation at the pan through the Early Stone Age (ESA), Middle Stone Age (MSA), and Late Stone Age (LSA). Thousands of square kilometres of Bushmanland are covered by low-density lithic scatters, and it is therefore not surprising that Stone Age sites and lithic scatters were identified between the Garona substation and the Gariep/Orange River in numerous surveys conducted during the recent years. Archaeological surveys have shown rocky outcrops and hills, drainage lines, riverbanks and confluences to be prime localities for archaeological finds and specifically Stone Age sites since these areas where utilized for base camps close to water and hunting ranges. If any such features occur in the study area, Stone Age manifestations can be anticipated

Locally, scatters of stone artefacts around Kakamas have been reported. The lithics documented are predominantly associated with the MSA, with a few localities attributed to the LSA. The incidences of lithics have little to no context and are largely described as of poor preservation and of low significance. It is noted that 95% of the tools documented are made from locally available, fine-grained banded ironstone, which is a favoured raw material on many sites in the Northern Cape. The remainder are in indurated shale, chert, quartzite and quartz, and hornfels.

According to the Heritage Impact Assessment (**Appendix 5B**), a total of eight incidences of Stone Age material were recorded across the surveyed area. All eight locations are within the northern section of the surveyed area, with one isolated occurrence close to the northern boundary. The lithics are scattered ex situ in low densities along dry riverine and drainage lines, and amongst quartzite surface gravel. The cultural material shows various degrees of weathering and may either be representative of the Early Later Stone Age, or a mere mixture of LSA and MSA artefacts.

No formal or informal graves, and no historical features were identified.

According to the Heritage Impact Assessment (**Appendix 5B**), the proposed development is entirely underlain by the Riemvasmaak Gneiss of the Namaqua-Natal Province. The Riemvasmaak Gneiss is an igneous rock type and the potential for any fossil materials occurring within this rock unit is zero.

6. SERVICES

Due to the nature of the proposed development, services from the municipality, and or other service provider will not be utilised. However, the development will be requiring additional water for the irrigation purposes.

A brief description of the bulk services is given below.

6.1 WATER

Water will be extracted from the Orange River from the proposed new extraction point via floating pumps.

A maximum extraction will be 8750m^3 per day, however, the average daily extraction will be less, depending on climatic conditions and stage of growth of the plants.

It is proposed that a storage dam be constructed with a 48hr capacity of 17 500m^3. The dam will be approximately 4m deep, and will have a surface area of approximately 4 500m^2. It will either be a square shape (approximately 66mx 66m), or circular with a diameter of approximately 76m.

The irrigation dam will be located in the south-eastern corner of the property, between existing vineyards.

Figure 10: Proposed location of the irrigation dam (indicated by the blue polygon).

7. PROCESS TO DATE

The section below outlines the various tasks undertaken to date, the members of the team involved in the project, as well as the Public Participation Process.

7.1 TASKS UNDERTAKEN TO DATE

Table 1: Tasks undertaken in the EIA to date

DATE	TASK
INITIAL PUBLIC PARTICIPATION AND DRAFT (PRE-APPLICATION) SCOPING PHASE	
04 June – 09 July 2018	Initial public participation, including newspaper advertisements, posters, letter drops and notification letters to identified interested and affected parties.
October 2018	Compilation of the Draft Scoping Report
16 November – 21 December 2018	Distribution of notification letters and the Draft Scoping Report to Registered Interested and Affected Parties
NEMA APPLICATION FORM AND POST- APPLICATION SCOPING PHASE	
13 February 2019	Submit Application Form and Post-Application Scoping Report to DE&NC
18 February 2019	Received acknowledgement from DE&NC
13 February – 16 March 2019	30-day comment period on the Post-Application Scoping Report. Notices of the availability of the Scoping Report sent to all Registered Interested and Affected Parties
21 March 2019	Final Scoping Report submitted to DENC for a decision
25 April 2019	Acceptance of Scoping Report and Plan of Study for EIA (Appendix 1B)
	Undertake Specialist Studies where required

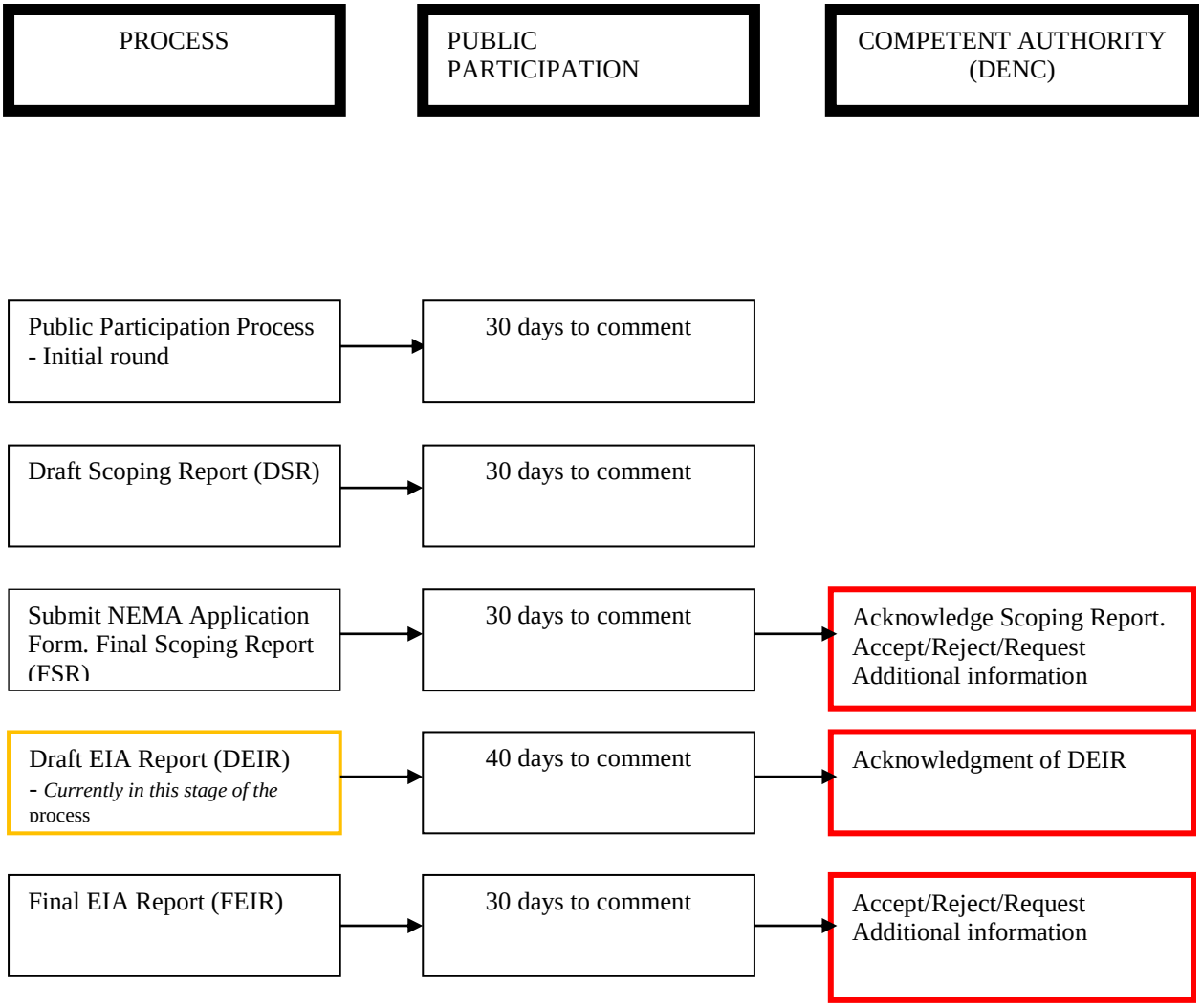

Figure 11. Summary of the EIA process and public participation process. The red indicates the stages where the competent authority will be consulted during the process.

7.2 TASKS TO BE UNDERTAKEN DURING THE EIA PHASE

The following tasks must still be undertaken during the EIA phase of the process:

- Compile Draft Environmental Impact Report (EIR) for public comment based on specialist information (THIS DOCUMENT).
- Advertise Draft EIR for public comment
- Distribute and/or make the Draft EIR available for viewing and comment
- Receive comments on Draft EIR. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (EIR).
- Preparation of a FINAL EIR for submission to DE&NC for consideration and decision-making.

Please refer to Figure 11 to see where the public participation process is present in the environmental impact assessment. The Interested and Affected Parties will have a chance to view and comment on all the reports that are submitted. The figures also indicated what timeframes are applicable to what stage in the process. If required, meetings with key stakeholders will be held.

At the end of the comment period, the EIR will be revised in response to feedback received from I&APs. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (EIR). The Final EIR will then be submitted to DE&NC for consideration and decision-making.

Correspondence with I&APs will be via post, fax, telephone, email and newspaper advertisements.

Should it be required, this process may be adapted depending on input received during the on-going process and as a result of public input. DE&NC will be informed of any changes in the process.

7.3 PROFESSIONAL TEAM

The following professionals are part of the project team.

Table 2: Members of the professional team

DISCIPLINE	SPECIALIST	ORGANISATION
Environmental Consultants	Clinton Geyser / Bernard de Witt	**EnviroAfrica**
Soil Study	Danie Kritzinger	**AgriMotion**
Freshwater Specialist	Dr. Dirk van Driel	**Watsan Africa**
Botanist	Peet Botes	**PB Consult**
Heritage	Jan Englebrecht/ Heidi Fivaz	**Ubique Heritage Consultants**

7.4 PUBLIC PARTICIPATION

Interested and Affected Parties (I&APs) have been and will be identified throughout the process. Landowners adjacent to the proposed site, relevant organs of state, organizations, ward councillors and the Local and District Municipality were added to this database. A complete list of organisations and individual groups identified to date is shown in **Appendix 3A.**

Public Participation will be conducted for the proposed agricultural development in accordance with the requirements outlined in Regulation 41 of the NEMA EIA Regulations 2014. The issues and concerns raised during the scoping phase will be dealt with in the EIA phase of this application.

As such each subsection of Regulation 41 contained in Chapter 6 of the NEMA EIA Regulations 2014 will be addressed separately to thereby demonstrate that all potential Interested and Affected Parties (I&AP's) were notified of the proposed development.

R54 (2) (a):

R41 (2) (a) (i): A poster was displayed on the property fence near the farm entrance with the N14 of the proposed site. Posters were also be placed at conspicuous sites around the site, including the pedestrian entrance to the Triple D Farms staff housing, and near the staff housing of the adjacent farm where the proposed pipeline crosses the dirt road. Posters were also placed in Kakamas, including at the Agrimark in Kakamas and at the Kai !Garib Municipality offices (please refer to **Appendix 3D**)

The posters contained all details as prescribed by R41(3) (a) & (b) and the size of the on-site poster was at least 60cm by 42cm as prescribed by section R41 (4) (a).

R41 (2) (a) (ii): N/A. There is no alternative site.

R41 (2) b):

R41 (2) (b) (i): An initial notification letter was sent to the landowner/s (please refer to **Appendix 3C** for proof of notification letters sent) and letter drops were conducted at the staff housing on the site.

R41 (2) (b) (ii): Initial notification letters will be delivered to landowners and occupiers adjacent to the site (please refer to **Appendix 2C** for proof of notification letters sent and **Appendix 3D** for photographic proof of letter drops).

R41 (2) (b) (iii): An initial notification letter was sent to the municipal Ward councillor at the Kai !Garib Municipality, for the ward in which the site is situated (please refer to **Appendix 3C** for proof of notification letters sent).

R41 (2) (b) (iv): An initial notification letter was sent to the Municipal Manager and mayor of Kai !Garib Municipality as the municipality is the Applicant

R54 (2) (b) (v): Initial notification letter (please refer to **Appendix 3C** for proof of notification letters sent) will be sent to the following organs of state having jurisdiction in respect of any aspect of the activity:

- Department of Water and Sanitation
- Department of Agriculture and Land Reform
- Department of Roads and Public Works
- Department of Agriculture, Forestry and Fisheries
- Department of Cooperative Governance, Human Settlements and Traditional Affairs
- SANRAL
- Department of Environment and Nature Conservation

R41 (2) (c) (i): An advertisement was placed in the local newspaper, Express Northern Cape, on 06 June 2018 (please refer to **Appendix 3B** for proof of advertisement).

R41 (2) (d): N/A

R41 (6):
R41 (6) (a): All relevant facts in respect of the application were made available to potential I&AP's.

R41 (6) (b): I&AP's were given more than a 30-day registration and comment period on the proposed application during the first round of public participation.

R42 (a), (b), (c) and R43(2): A register of interested and affected parties was opened, maintained and is available to any person requesting access to the register in writing (please refer to **Appendix 3A** for the list of Interested and Affected Parties.

Please find attached in **Appendix 3**:

- Proof of Notice boards, advertisements and notices that were sent out
- List of potential interested and affected parties
- Summary of issues raised by interested and affected parties

7.4.1 PUBLIC PARTICIPATION UNDERAKEN DURING THE EIA PHASE:

A number of groups and individuals were identified as Interested and Affected Parties during the initial Public Participation Process. A complete list of organisations and individual groups identified to date, as well as those I&APs that have registered are shown in **Appendix 3A.**

Full copies of the Environmental Impact Assessment Report (EIR) will be sent to all Registered I&APs, and will be notified of the Environmental Impact Report (EIR) by means of notification letters (via preferred method of communication), informing them of the availability of the Draft EIR and will be invited to comment. The EIR will be made available for a 30-day comment period.

At the end of the comment period, the EIR will be revised in response to feedback received from I&APs. All comments received and responses to the comments will be incorporated into the Final Environmental Impact Report (Final EIR) in the form of a Comments and Response Table. The Final EIR will be made available for a further 30-day comment period. The Final EIR will then be submitted to DENC for decision.

Should it be required, this process may be adapted depending on input received during the ongoing process and as a result of public input. Both DENC and registered I&APs will be informed of any changes in the process.

7.4.2 INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) have been notified by means of advertisements in regional and local newspapers, site notices and letters and/or emails to registered I&APs on the project database.

A list of I&APs is included as **Appendix 3A**.

8. ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

Environmental issues were raised through informal discussions with the project team, specialists and authorities, as well as by Interested and Affected Parties during the public participation period of the Scoping Report. All issues raised will be assessed in the specialist reports and will form part of the Environmental Impact Report. Any additional issues raised during the public participation will be listed in the Final Environmental Impact Report.

The following potential issues have been identified:

8.1 BOTANICAL

Due to the size of the development and the expectant loss of vegetation during the construction phase of the project, a Botanical Impact Assessment (**Appendix 5A**), has been conducted. This will also determine if there is any sensitive or endangered vegetation on the proposed site.

The botanical assessment will include the following:

- The significance of the potential impact of the proposed project, alternatives and related activities – with and without mitigation – on biodiversity pattern and process at the site, landscape and regional scales.
- Recommended actions that should be taken to prevent or, if prevention is not feasible, to mitigate impacts.

8.2 HERITAGE

Due to the nature and scale of the development, the possible impact on heritage resources has been identified as a possible environmental impact as a result of the development of the vineyards and associated infrastructure.

A Heritage Impact Assessment (**Appendix 5B**) has been conducted on the site.

The terms of reference for the Heritage studies are as follows:

- To determine whether there are likely to be any important archaeological and palaeontological sites or remains that might be impacted by the proposed development;
- To identify and map archaeological sites/remains that might be impacted by the proposed development;
- To assess the sensitivity and conservation significance of archaeological sites/remains in the inundation area;
- To assess the status and significance of any impacts resulting from the proposed development, and;
- To identify measures to protect any valuable archaeological sites/remains that may exist within the estimated area.

8.3 FRESHWATER

Due to the size and nature of the development and the location of the proposed development with respect to the Orange River, and the ephemeral streams on the site, a freshwater impact assessment was conducted.

The terms of reference for the Freshwater assessment are as follows:

- Literature review and assessment of existing information
- Site Assessment of the proposed activities and impact on the associated freshwater systems. This will include an assessment of the freshwater ecological condition, using river health indices such as in-stream and riparian habitat integrity, aquatic macro-invertebrates and riparian vegetation to determine set back lines and geomorphological condition of the streams, which will then determine the overall Ecostatus of the streams and provide data that will inform the Water Use Licence Application of the project..
- Describe ecological characteristics of freshwater systems and compile report based on the data and information collected in the previous two tasks, describe ecological characteristics of the freshwater systems, comment on the conservation value and importance of the freshwater systems and delineate the outer boundary of the riparian zones/riverine corridors.
- Evaluate the freshwater issues on the site and propose mitigation measures and measures for the rehabilitation of the site as well as setback lines for future development.
- Compilation of the documentation for submission of the water use authorisation application (WULA) to the Department of Water and Sanitation (if deemed necessary).

8.4 SOIL STUDY

A Soil Study was conducted independently of this Environmental Impact process, for the Applicant to determine the suitability of the soils to vineyards, and provide recommendations with regards to irrigation, soil preparation etc. to maximise yields, prevent wastage of resources etc.

8.5 OTHER ISSUES AND IMPACTS

The proposed Triple D agricultural development has the following additional impacts:

8.5.1 ENERGY REQUIREMENTS

Construction energy requirements:
Energy requirements during the construction phase is negligible.

Operational phase energy requirements:
The existing Eskom connection will be utilised during the operational phase for the use of pumps.

8.5.2 WATER REQUIREMENTS

The maximum daily irrigation requirements for the proposed development is calculated at approximately 8750m^3. This will typically be the maximum extraction in a 24hr period from the Orange River. However, the average daily extraction would be less than this depending on the climatic conditions and stage of plants.

8.5.3 NATURE AND QUANTITY OF RAW MATERIALS

The proposed dam will be a partially sunken earth dam, with exacavted sand and soil being used to build up the dam walls.

This development is not expected to utilize any raw materials besides water for irrigation during the operational phase (see water requirements above).

8.5.4 WASTE TYPES, QUANTITIES AND DISPOSAL METHODS

Construction Phase

The construction phase is not expected to produce significant amounts of construction waste.

Natural vegetation removed will be consolidated and left to decompose, to be used as compost during the operational phase

Excavated soil from the earth dam site will be used to build up the dam walls. Excess soil and rock can be used for levelling in other parts of the site.

Operational Phase

Since the development is agricultural in nature, with only vineyards be cultivated, the only expected waste will be organic in nature, such as vine cuttings, and grape waste (skins, seeds). This waste will also be consolidated and left to decompose, to be used as compost.

There will be no industrial or manufacturing activities in the development, and as such, no hazardous waste or emissions is expected to be generated.

8.5.5 EMPLOYMENT OPPORTUNITIES

Construction Phase

According to the Applicant, approximately 120 employment opportunities will be created during the construction phase, shared between skilled and un-skilled workers. 100% of these job opportunities will be towards previously disadvantaged individuals and will also mostly benefit the local community and local economy.

The expected value of the employment opportunities during the operational and construction phase will be approximately R6.8million.

Operational Phase

According to the Applicant, up to 120 skilled and up to 480 unskilled job opportunities will be created during the operational phase. 100% of these job opportunities will be towards previously disadvantaged individuals.

The expected current value of the employment opportunities during the first 10 years is approximately R49million. The majority of the wage bill earned by these workers will be spent in the local economy which, in turn, will benefit local companies and businesses in Kakamas. The operational phase of the

proposed development will therefore create significant socio-economic benefits and opportunities for the local community.

9. SPECIALIST STUDIES

Based on the issues raised by the I&APs and the project team, specialist studies were undertaken to provide information to address the concerns and assess the impacts of the proposed development alternatives on the environment.

The specialists are provided with set criteria for undertaking their assessments, to allow for comparative assessment of all issues. These criteria are detailed in the Terms of Reference to each specialist and summarised below.

9.1 CRITERIA FOR SPECIALIST ASSESSMENT OF IMPACTS

These criteria are based on the EIA Regulations, published by the Department of Environmental Affairs and Tourism (April 1998) in terms of the Environmental Conservation Act No. 73 of 1989.

These criteria include:

- **Nature of the impact**
  This is an appraisal of the type of effect the construction, operation and maintenance of a development would have on the affected environment. This description should include what is to be affected and how.
- **Extent of the impact**
  Describe whether the impact will be: local extending only as far as the development site area; or limited to the site and its immediate surroundings; or will have an impact on the region, or will have an impact on a national scale or across international borders.
- **Duration of the impact**
  The specialist should indicate whether the lifespan of the impact would be short term (0-5 years), medium term (5-15 years), long terms (16-30 years) or permanent.
- **Intensity**
  The specialist should establish whether the impact is destructive or benign and should be qualified as low, medium or high. The specialist study must attempt to quantify the magnitude of the impacts and outline the rationale used.
- **Probability of occurrence**
  The specialist should describe the probability of the impact actually occurring and should be described as improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of any prevention measures).

The impacts should also be assessed in terms of the following aspects:

- **Status of the impact**
  The specialist should determine whether the impacts are negative, positive or neutral (“cost – benefit” analysis). The impacts are to be assessed in terms of their effect on the project and the environment. For example, an impact that is positive for the proposed development may be negative for the environment. It is important that this distinction is made in the analysis.

- **Accumulative impact**
  Consideration must be given to the extent of any accumulative impact that may occur due to the proposed development. Such impacts must be evaluated with an assessment of similar developments already in the environment. Such impacts will be either positive or negative, and will be graded as being of negligible, low, medium or high impact.
- **Degree of confidence in predictions**
  The specialist should state what degree of confidence (low, medium or high) is there in the predictions based on the available information and level of knowledge and expertise.

Based on a synthesis of the information contained in the above-described procedure, the specialist is required to assess the potential impacts in terms of the following significance criteria:

- **No significance**: the impacts do not influence the proposed development and/or environment in any way.
- **Low significance**: the impacts will have a minor influence on the proposed development and/or environment. These impacts require some attention to modification of the project design where possible, or alternative mitigation.
- **Moderate significance**: the impacts will have a moderate influence on the proposed development and/or environment. The impact can be ameliorated by a modification in the project design or implementation of effective mitigation measures.
- **High significance**: the impacts will have a major influence on the proposed development and/or environment.

The final impact assessment report should at least include the following sections:

- Executive Summary
- Introduction and Description of Study
- Methodology
- Results
- Assessment of Impacts (including mitigation measures to reduce negative impacts and measures to enhance positive impacts and the completion of impact tables)
- Discussion
- Recommendations (Pre-Construction, Construction and Operational Phases)
- Conclusion

9.2 BRIEFS FOR SPECIALIST STUDIES TO BE UNDERTAKEN AS PART OF THE EIA

9.2.1 BOTANICAL ASSESSMENT

Peet Botes (PB Consult) was appointed and undertook the Botanical Assessment on the proposed site – **Appendix 5A**.

The terms of reference for this study include the following:

- Evaluate the proposed site(s) in order to determine whether any significant botanical features will be impacted as a result of the proposed development.

- Determine and record the position of any plant species of special significance (e.g. protected tree species, or rare or endangered plant species) that should be avoided or that may require "search & rescue" intervention.
- Locate and record sensitive areas from a botanical perspective within the proposed development footprint that may be interpreted as obstacles to the proposed development.
- Make recommendations on impact minimization should it be required
- Consider short- to long-term implications of impacts on biodiversity and highlight irreversible impacts or irreplaceable loss of species.

9.2.2 HERITAGE IMPACT ASSESSMENT

Jan Engelbrecht of the Ubique Heritage Consultants was appointed to compile the Heritage Impact Assessment (HIA) – **Appendix 5B**.

The terms of reference for the heritage impact study were:

- the identification and mapping of all heritage resources in the area affected;
- an assessment of the significance of such resources in terms of heritage assessment criteria set out in regulations;
- an assessment of the impact of the development on heritage resources; an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;
- if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and
- plans for mitigation of any adverse effects during and after completion of the proposed development.

In addition, the HIA/AIA should comply with the requirements of NEMA, including providing the assumptions and limitations associated with the study; the details, qualifications and expertise of the person who prepared the report; and a statement of competency.

9.2.3 FRESHWATER IMPACT ASSESSMENT

Dr Dirk van Driel (Watsan Africa) has been appointed to undertake the Water Use Licence Application (WULA) in terms of section 21 of the National Water Act (NWA, 36 of 1998).

A Fresh Water Report (**Appendix 5C**) is a WULA requirement. The Freshwater Assessment must also include the following:

- A description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed facility.
- A description and assessment of the potential freshwater resources and potential issues and impacts associated with the proposed development on these resources.
- Identification of enhancement and mitigation aimed at maximizing opportunities and avoiding and or reducing negative impacts.

10. ASSESSMENT OF ENVIRONMENTAL IMPACTS

The specialist studies detailed in Section 8 and 9 were undertaken to determine significance of the impacts that may arise from the proposed development. The findings of the specialist studies are summarised here. Full copies of the studies are included in **Appendices 5A – 5C**.

The following specialist studies were undertaken:

10.1 BOTANICAL ASSESSMENT

Peet Botes (PB Consult) undertook the Botanical Impact Assessment – The Botanical Impact Assessment is included as **Appendix 5A**.

10.1.1 KEY FINDINGS

According to the Botanical Impact Assessment (**Appendix 5A**), in accordance with the Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006, as updated in the 2012 beta version) only one broad vegetation type is expected in the proposed area and its immediate vicinity, namely **Bushmanland Arid Grassland**. More than 99% of this vegetation still remains, but only 4% is formally conserved (Augrabies Falls National Park). According to the National list of ecosystems that are threatened and in need of protection (GN 1002, December 2011), Bushmanland Arid Grassland, remains classified as *Least Threatened*.

- **Vegetation Encountered**

Two definite communities were encountered namely a sparse (semi-desert type) low shrubland with grasses sometimes present (expected to be more prominent after rain) on the open undulating plains, while a denser and higher riparian vegetation was encountered next to the watercourses. The more pronounce these water courses the more established the riparian zone became. Because of the arid nature of the region (and the unpredictability of rainfall) the carrying capacity of the veld is very low and much of the natural veld is expected to have suffered from incorrect grazing or overgrazing practices

Open Plains - The vegetation encountered on the open gravelly plains can be described as a sparse low shrubland (sometimes even a dwarf shrub layer), with surface rocks and sometimes even small/low rocky outcrops showing above ground (to the north of the site, larger rocky outcrops were also encountered). The vegetation varied from a sparse low shrubland dominated by *Tetraena decumbens (=Zygophyllum)* to a very sparse open low shrubland either dominated by either *Tetraena decumbens* or by *Justicia australis (=Monechma)*, in the calcrete patches

The following plant species were observed scattered throughout the site (never dominating, but sometimes encountered in patches); the small *Acanthopsis disperma*, the common *Aloe claviflora*, **two individuals of *Aloidendron dichotomum*** (a third was observed outside of the proposed footprint)*, Aptosimum spinescens, Asparagus* cf. *cooperi, Avonia* cf. *papyracea*, *Berkheya fruticosa*, *Blepharis mitrata*, two individuals of *Boscia albitrunca* (one in poor and one in fairly good condition), scattered individuals of *Boscia foetida*, patches of *Cynanchum viminale, Euphorbia gariepina,* and occasionally the smaller *Euphorbia* cf. *rhombifolia*, *Forsskaolea candida*, the common *Galenia*

africana, Geigeria filifolia, Justicia spartioides, Kleinia longiflora, Leucosphaera bainesii, Limeum aethiopicum, Lycium cinereum, the succulent *Mesembryanthemum coriarium* (=*Psilocaulon coriarium*), *Monsonia* cf. *patersonii*, *Ptycholobium biflorum*, *Rhigozum trichotomum,* the common *Rogeria longiflora*, *Salsola aphylla*, *Sericocoma avolans, Senegalia mellifera* and *Tapinanthus oleifolius.*

The vegetation encountered at the small rocky outcrops did not differ in species from that of its surroundings (although vegetation cover was sometimes slightly denser, as a result of the shelter given by the outcrops). The only plant that was not observed elsewhere and that was only found near one of the rocky outcrops to the north was *Berkheya glabrata.* Other species commonly associated with these outcrops were *Aloe dichotoma*, *Boscia foetida*, *Forsskaolea candida, Galenia africana* and *Tetraena decumbens.*

Riparian vegetation - The vegetation along the small ephemeral drainage lines and small seasonal water courses did not varied much, apart from becoming denser and larger, the more pronounce the water course becomes. The following plants were commonly observed in association with these seasonal water courses: *Asparagus* cf. *cooperi*, *Boscia foetida*, the herb *Chascanum garipense*, *Hermannia stricta, Jamesbrittenia glutinosa*, *Justicia spartioides*, *Montinia caryophyllacea*, *Osteospermum scariosum*, *Ozoroa dispar*, *Parkinsonia africana*, *Rhigozum trichotomum Senegalia mellifera, Tapinanthus oleifolius, Tetragonia reduplicata* and *Ziziphus mucronata.*

Pipeline route - The proposed pipeline route includes the establishment of a new pump station at the banks of the Orange River. From there it will be placed in or next to existing farm roads through transformed agricultural area (as is the case along most of the banks of the Orange River in this area), with only the last section passing along an area with some very disturbed natural veld next to a seasonal water course.

The proposed location for the placement of the extraction pump is located on a disturbed portion of the Orange River, already used as an access point / jetty for the small boats. As long as the pipeline is located within the existing disturbance footprint, the impact on vegetation will be minimal. Next to the disturbance footprint, disturbance indicator plants, alien invasive species (Prosopis species) and some remaining natural vegetation was encountered, the most important of which was *Phragmites australis* stands stabilizing the river banks and the small indigenous trees, *Vachellia karroo* (=*Acacia karroo*) and *Tamarix usneoides*. Other species included disturbance indicators like *Mesembryanthemum guerichianum*, *Mesembryanthemum coriarium* and the herb *Jamesbrittenia glutinosa*.

From the banks of the Orange River the pipeline will follow existing roads for the next 1.7 km through areas under intensive cultivation (mostly vineyards). Through this section the impact there should be no impact on any natural veld (transformed land) and as long as the pipeline stays next to or within the existing roads, impact on agriculture should be minimal.

The final section of the pipeline will be located next to a badly disturbed area, but with some natural plants still remaining, next to a seasonal stream. Unfortunately, this area is very disturbed and degraded, and the riparian vegetation is mostly replaced by the alien *Prosopis* trees, Beefwood (*Casuarina* species), with the occasional indigenous *Vachellia karroo,* patches of *Phragmites australis* and some disturbance indicator species remaining (e.g. *Mesembryanthemum guerichianum*, *Mesembryanthemum coriarium, Lycium species, Rhigozum trichotomum* and *Senegalia mellifera).* Since this area is very disturbed with very little remaining natural veld and running next to a seasonal stream, the exact location of the pipeline should be advised by the Freshwater Specialist report.

Impact on any significant vegetation or species should be minimal, especially if the pipeline route is placed as near to or within the existing farm roads to the west of the stream.

- **Critical Biodiversity Areas**

The Northern Cape CBA Map (2016) identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole.

Critical biodiversity areas (CBA's) are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services (SANBI 2007). The primary purpose of CBA's is to inform land-use planning in order to promote sustainable development and protection of important natural habitat and landscapes. CBA's can also be used to inform protected area expansion and development plans.

- Critical biodiversity areas (CBA's) are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses.
- Ecological support areas (ESA's) are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree of restriction on land use and resource use in these areas may be lower than that recommended for critical biodiversity areas.

The 2016 Northern Cape Critical Biodiversity Areas (NCCBA) gives both aquatic and terrestrial Critical Biodiversity Areas (CBAs) and ecological support areas for the Northern Cape.

According to the NCCBA (see Figure 12 below), the proposed development will be located within a CBA.

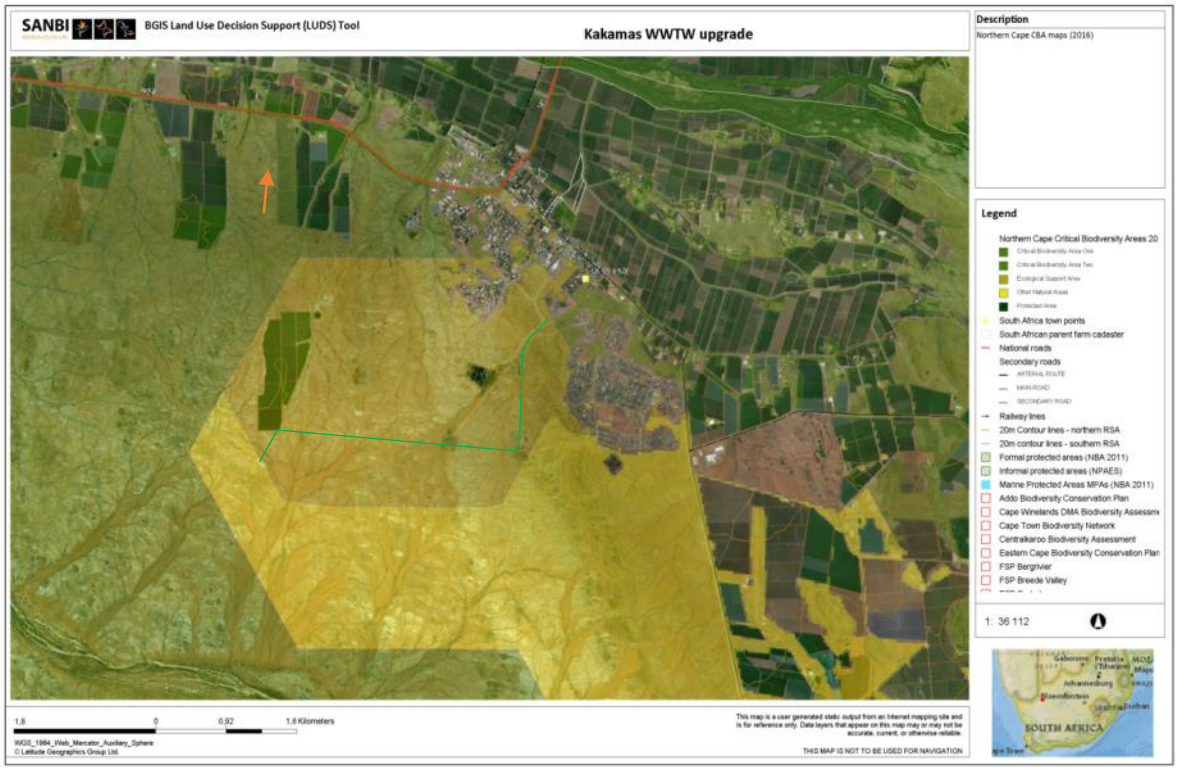

Figure 12: The Northern Cape Critical Biodiversity Areas (2016) showing the location of the proposed development

- **Centres of Endemism**

The proposed development does not impact on any recognised centre of endemism. The Gariep Centre is located to the north (quite a distance away) associated with Augrabies, Pella and Onseepkans along the border of South Africa and Namibia, while the Griqualand West Centre of Endemism starts to the east of Upington Northern Cape Province. The proposed site does not fall within any recognised centre of endemism.

- **Flora Encountered**

Please refer to Table 2, page 19 of the Botanical Impact Assessment (**Appendix 5A**), for the list of species encountered within the development area.

- **Threatened and Protected Plant Species**

In the Northern Cape, species of conservation concern are also protected in terms of national and provincial legislation, namely:

- The National Environmental Management: Biodiversity Act, Act 10 of 2004, provides for the protection of species through the "*Lists of critically endangered, endangered, vulnerable and protected species*" (GN. R. 152 of 23 February 2007).
- National Forest Act, Act 84 of 1998, provides for the protection of forests as well as specific tree species through the "*List of protected tree species*" (GN 908 of 21 November 2014).

- Northern Cape Nature Conservation Act, Act of 2009, provides for the protection of "*specially protected species*" (Schedule 1), "*protected species*" (Schedule 2) and "*common indigenous species"* (Schedule 3).

Red list of South African plant species - One red-listed species was observed, namely *Aloidendron dichotomum* (Quiver Tree) (Vulnerable). Two individuals observed at the following locations (see also Figure 13 below):

- S28° 46' 27.4" E20° 35' 05.5"
- S28° 46' 27.5" E20° 35' 18.9"

NEM:BA protected plant species - The National Environmental Management: Biodiversity Act, Act 10 of 2004, provides for the protection of species through the "Lists of critically endangered, endangered, vulnerable and protected species" (GN. R. 152 of 23 February 2007). No NEM: BA protected species was observed.

NFA Protected plant species - The National Forests Act (NFA) of 1998 (Act 84 of 1998) provides for the protection of forests as well as specific tree species (as updated). One species protected in terms of the NFA was observed, namely *Boscia albitrunca* (Sheppard's tree). Two individuals observed at the following locations (see also Figure 13 below):

- S28° 46' 43.7" E20° 35' 06.1"
- S28° 46' 31.8" E20° 35' 14.9"

NCNCA protected plant species - The Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) came into effect on the 12th of December 2011, and also provides for the sustainable utilization of wild animals, aquatic biota and plants. Schedule 1 and 2 of the act give extensive lists of specially protected and protected fauna and flora species in accordance with this act. NB. Please note that all indigenous plant species are protected in terms of Schedule 3 of this act (e.g. any work within a road reserve). A number of species protected in terms of the NCNCA were encountered. Please refer to Table 5, page 22 of the Botanical Impact Assessment (**Appendix 5A**).

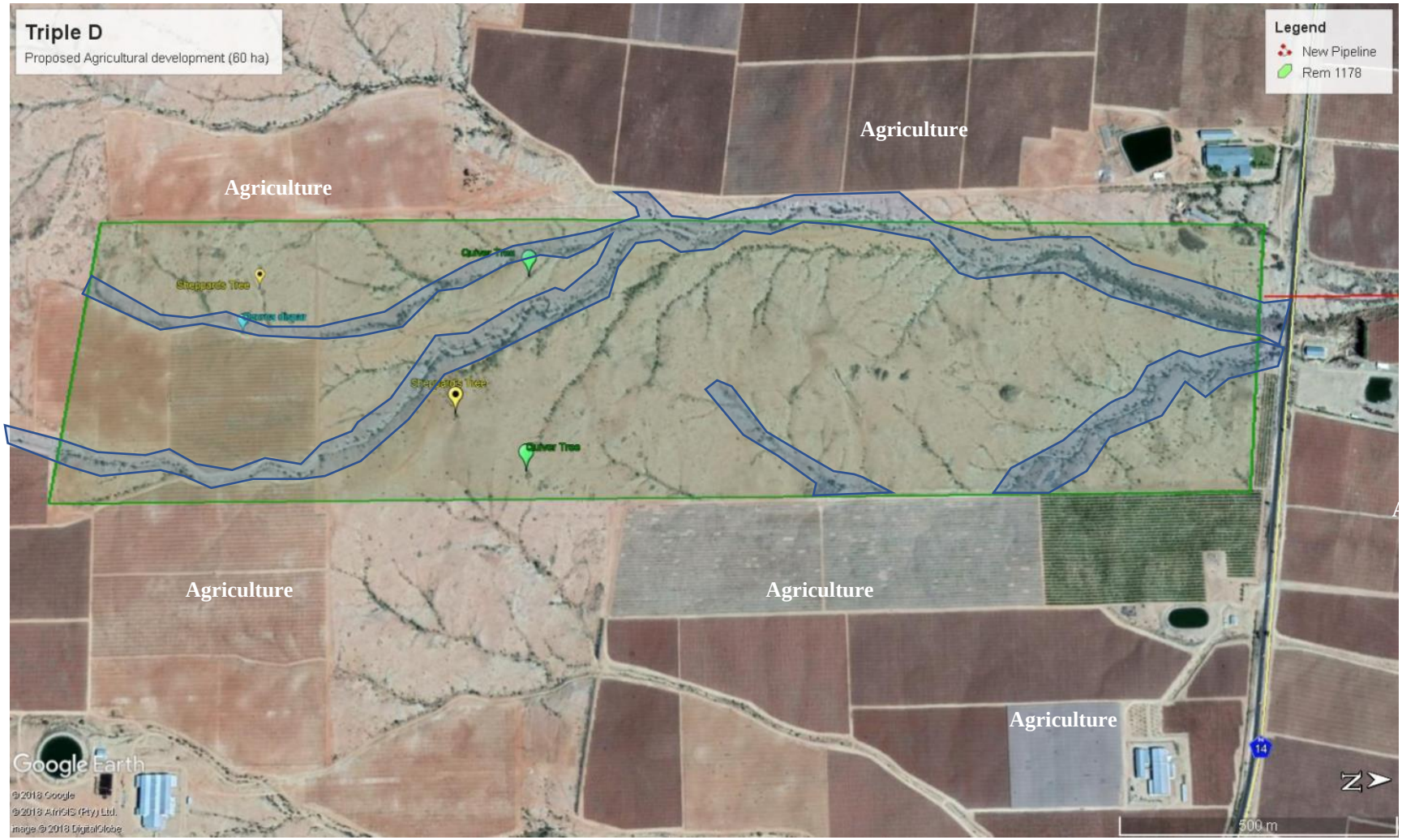

Figure 13: Botanical sensitivity Map based on the more significant water courses and its associated riparian vegetation

10.1.2 IMPACT ASSESSMENT

According to the Botanical Impact Assessment (**Appendix 5A**), the main impacts associated with the proposed development will be on:

- Watercourses with its associated riparian zone;
- Protected plant species, one of which is vulnerable (Aloidendron dichotomum);
- the fact that the development site falls within a CBA contribute to significance of vegetation status, conservation priority and connectivity.

Without mitigation the cumulative impact is expected to be Medium/High, which should be unacceptable, especially since the impact can easily be reduced to Medium/Low through the implementation of mitigation measures.

10.1.3 MITIGATION MEASURES

The following mitigation actions should be implemented to ensure that the proposed development does not pose a significant threat to the environment:

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies.
- The proposed 60 ha development must be located within the >100 ha area that was investigated in such a way that the impact on the more significant water courses (and its associated riparian vegetation) as depicted in Figure 13, and the 4 protected trees (Sheppard- and Quiver trees) are minimised.
- It is recommended that a **minimum buffer of at least 3 – 5 m is established next to these water courses** (Refer to Figure 13), measured from the edge of the water course (not the centre of the water course) in order to protect the existing riparian vegetation. Access road may not intrude into these buffer zones. In other words the access road may not form the buffer zone, but must be placed away from the water course and outside of this buffer zone.
- Ideally the development should be placed to minimise the impact on these water courses, while at the same time leaving a north-south migration corridor (for instance a 30m corridor associated with the main western water course).
- The two ***Boscia albitrunca*** **trees** (Refer to Figure 13) should be protected, in location, if at all possible. Since these trees transplant poorly, search & rescue is not considered a viable option. If they have to be removed, permits must be obtained in terms of the National Forest Act (NFA) and the Northern Cape Nature Conservation Act (NCNCA).
- The two ***Aloidendron dichotomum*** **trees** (Refer to Figure 13) should be protected, ideally in location, if at all possible. However, these trees can be transplanted and search and rescue may be an option. However, if they are moved, a permit for their re-location must be obtained in terms of the NCNCA and they must be transplanted back within the immediate surroundings. The transplantation must be overseen by a botanist or suitably qualified person

and a watering program must be implemented to support these trees until they have re-established themselves.

- The Search & Rescue recommendations given in Table 5 of the Botanical Impact Assessment must be implemented with regards to other protected species encountered and a DENC flora permit must be obtained in terms of the NCNCA.
- Future farm roads must be approved by the ECO and may not impact on the buffer zones next to the streams.
- Before any work is done the 60 ha development footprint, future roads and access routes must be clearly demarcated (to ensure the above mitigation measures are correctly interpreted) and approved by the ECO. The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of any area outside of the construction footprint must be avoided.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
  - This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material.
  - It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment.
- An integrated waste management approach must be implemented during construction.
  - Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
  - All rubble and rubbish should be collected and removed from the site to a suitable registered waste disposal site.
- The pipeline route must be adjusted to minimise the impact on any large indigenous tree that might be encountered along its route and the construction footprint must be minimised as much as possible.

According to the Botanical Impact Assessment (**Appendix 5A**), the following species are protected in terms of the NCNCA were encountered. Recommendations on impact minimisation also included.

Table 3: Plant species protected in terms of the NCNCA encountered within the study area

	SPECIES NAME	**COMMENTS**	**RECOMMENDATIONS**
1.	*Aloe claviflora* **Schedule 2 protected**	Occasionally observed, but should be easy to avoid.	**Search & rescue**: Individuals within footprint to be transplanted to surrounding areas.
2.	*Aloidendron dichotomum* **Schedule 1 protected**	Two individuals observed at the following locations: S28° 46' 27.4" E20° 35' 05.5" S28° 46' 27.5" E20° 35' 18.9"	**Do not disturb**: Plants can be transplanted, but site layout should be adjusted if possible. Otherwise they must be transplanted outside of the footprint and a watering program must be implemented until they have established themselves. A NCNCA permit will be required.
3.	*Boscia albitrunca* **Schedule 2 protected**	Two individuals observed at the following locations: S28° 46' 43.7" E20° 35' 06.1" S28° 46' 31.8" E20° 35' 14.9"	**Do not disturb**: Plants transplant poorly. Development should avoid coming nearer than 1 m of the canopy cover (or drip line) of any of these trees. If they have to be removed, a NFA permit will be required as well as a NCNCA permit.

4.	*Boscia foetida* **Schedule 2 protected**	Occasionally observed within the footprint. However, they were mostly stumped or small species or associated with water courses.	**Search & rescue**: Individuals within footprint to be transplanted to surrounding area and a buffer zone to be established next to significant water courses (which will ensure the protection of the majority of these plants).
5.	*Cynanchum viminale* **Schedule 2 protected**	Occasionally observed within the footprint.	Larger *Cynanchum* plants are expected to transplant poorly. Species protection through topsoil conservation.
6.	*Euphorbia gariepina* **Schedule 2 protected**	All species in the genus *Euphorbia* protected by default. Locally common.	Larger *Euphorbia* transplant poorly. Species protection through topsoil conservation.
7.	*Euphorbia rhombifolia* **Schedule 2 protected**	Occasionally observed. All species in the genus *Euphorbia* protected by default.	**Search & rescue**: Individuals within footprint to be transplanted to surrounding area.
8.	*Galenia africana* **Schedule 2 protected**	This plant is weedy a disturbance indicator and commonly found in Erf 1654.	No special measures needed, this is a weedy pioneer species.
9.	*Mesembryanthemum coriarium* **Schedule 2 protected**	This plant is a weedy disturbance indicator and commonly found throughout.	No special measures needed, this is a weedy pioneer species.
10.	*Tetragonia reduplicata* **Schedule 2 protected**	Only observed in association with water courses.	A buffer zone to be established next to significant water courses (which will ensure the protection of the majority of these plants).

10.1.4 CONCLUSION

The proposed development will result in the transformation of approximately 60 ha of natural vegetation (Least Threatened) within a proposed CBA area. It will also potentially impact on a number of significant water courses and its associated riparian vegetation, as well as 2 *Boscia albitrunca* (Protected in terms of the NFA) and 2 *Aloidendron dichotomum* trees (a red listed plant, and protected in terms of the NCNCA). In addition, it is also likely to impact on a number of other NCNCA plant species.

According to the impact assessment the development could have a medium/high impact on the environment, but with mitigation it can be reduced significantly to medium/low. **It is thus very important that the mitigation actions described above are implemented.**

With the correct mitigation it is likely that the development will then not contribute significantly to any of the following:

- Significant loss of vegetation type and associated habitat.
- Loss of ecological processes (e.g. migration patterns, pollinators, river function etc.) due to construction and operational activities.
- Loss of local biodiversity and threatened plant species.
- Loss of ecosystem connectivity.

10.2 HERITAGE IMPACT ASSESSMENT

Jan Engelbrecht of Ubique Heritage Consultants was appointed to undertake a Heritage Impact Assessment (HIA) of the proposed site. The HIA is included as **Appendix 5B**.

10.2.1 KEY FINDINGS

The following heritage resources were identified in the Heritage Impact Assessment (Appendix 5B):

- Archaeological features

A total of eight incidences of Stone Age material were recorded across the surveyed area. All eight locations are within the northern section of the surveyed area, with one isolated occurrence close to the northern boundary. The lithics are scattered ex situ in low densities along dry riverine and drainage lines, and amongst quartzite surface gravel. The cultural material shows various degrees of weathering and may either be representative of the Early Later Stone Age, or a mere mixture of LSA and MSA artefacts. The identified archaeological materials are of low significance, as the archaeological sample is small and without context, and therefor of little scientific value.

These Stone Age heritage finds are given a 'General' Protection C (Field Rating IV C). This means these sites have been sufficiently recorded (in the Phase 1). It requires no further action.

- Historical features

No significant historical features were identified within the study area.

- Graves

No formal or informal graves were identified in the study area.

- Palaeontological resources

The proposed development is entirely underlain by the Riemvasmaak Gneiss of the Namaqua-Natal Province. The Riemvasmaak Gneiss is an igneous rock type and the potential for any fossil materials occurring within this rock unit is zero.

10.2.2 IMPACT ASSESSMENT

Since no archaeological, historical or cultural sites that will be impacted on negatively by the proposed development, the impact of the proposed development on heritage resources is considered negligible

10.2.3 MITIGATION MEASURES

According to the Heritage Impact Assessment (**Appendix 5B**), based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

- The lithic traces on the landscape of the study area are of low significance and the impact of the development on these resources are inconsequential. No further mitigation is required. Therefore, from a heritage point of view we recommend that the proposed development can continue.

- Due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils. It is considered that the development of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area. If fossil remains are discovered during any phase of construction, either on the surface or unearthed by fresh excavations, the ECO in charge of these developments ought to be alerted immediately. These discoveries ought to be protected (preferably in situ) and the ECO must report to SAHRA so that appropriate mitigation (e.g. recording, collection) can be carry out by a professional palaeontologist.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If during construction, any possible discovery of finds such as stone tool scatters, artefacts, human remains, or fossils are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find.

10.2.4 CONCLUSION

The Heritage Impact Assessment (**Appendix 5B**), identified and recorded various heritage resources on Plot 2435 (formerly Plot 1178, Kakamas South Settlement, Kai !Garib Municipality, Mgcawu District Municipality, Northern Cape. In the development footprint are no archaeological, historical or cultural sites that will be impacted on negatively by the proposed development.

10.3 FRESHWATER ASSESSMENT

Dr Dirk van Driel (Watsan Africa) has been appointed to undertake the Freshwater Assessment of the proposed site and the Water Use Licence Application – The Freshwater Report is included as **Appendix 5C**.

10.3.1 KEY FINDINGS

- **Drainage Lines**

According to the Freshwater Assessment, a realistic and most probable impact of the proposed vineyard development is illustrated by the existing vineyards of the Triple D property. The drainage lines have been formalised.

In these formalised furrows there was no sign of any aquatic habitat or riparian zone during the site visits. The only wetness was of a little agricultural return flow that emanated from the filling of a tanker from a valve in a water line. It is fully expected that the drainage line on the proposed development would very much resemble the ones on the already developed property.

Present Ecological Status - The Triple D drainage line was assigned a class B (Table 4) for the instream assessment. Only a part of the sub-catchment has been lost to agriculture, while a large part still remains intact. This would obviously change when the site is developed, probably to class D or E, with the original morphology significantly altered.

The riparian zone was placed into a category C, not only because of the loss of habitat due to agriculture, but because of clear signs that earth moving machinery has been active in some parts of the area. There was not much of a riparian zone to begin with, with no typical riverine riparian vegetation or hydromorphic soils.

Ecological Importance - The Ecological Importance (EI) is based on the presence of especially fish species that are endangered on a local, regional or national level.

There are no fish in the drainage line, as there is no permanent water. According to this assessment, which is prescribed for WULA's, the drainage line is not important. No other endangered species, either plant or animal, were detected in or near the drainage line.

Ecological Sensitivity - If left to its own devices, the drainage line would remain as it is now, without the need for protection measures. However, if the agricultural development is allowed to proceed, the drainage line would probably never recover to any resemblance of its current state. In this regard it can be considered to be ecologically sensitive.

- **Orange River**

Biomonitoring - The sampling point is located directly below the Triple D farm on the southern bank of the Orange River. The site is marked by the water pump installation and is 520m to the north of the N14 road bridge on the boundary of the Triple D property.

The river here was broad and pool-like, approximately 250m wide, with little current along the bank. In the middle of the river the current was stronger. The bank was very steep, because of the berms that were constructed for flood management.

Phragmites reeds made up most of the emerging vegetation and recently submerged grasses in the shallows along the bank provided more habitat. Solid substrate was provided by the steel floats of the pumping installation. There were clumps of pondweed *Potamogeton* drifting down the current, which was sampled as well. The bottom was sandy and muddy, with no other substrate types.

The SASS5 score was at 50, high for this type of mature river habitat, with an average score per taxon (ASPT) of 5.6. This score left the Triple D result in the good, slightly impacted, category.

This positive result could be the result of the slightly better availability of habitat, with the pond weed, sandy bottom, submerged and emerging vegetation, or because the river was recently in flood, with an improvement in water quality, or it was because the drainage line was dry, with no agricultural return flow. This was in contrast with other drainage lines with large volumes of poor-quality return flow.

Water Quality – A water sample taken at the same sampling point showed that there was enough oxygen in the water to sustain healthy aquatic life. The water was rather fresh, not salty. The water was not as turbid as it usually is, despite the strong flow. The water is rather alkaline, as is often measured in the lower Orange River.
The ammonia concentration is low, which indicates that the river here is not subject to faecal pollution, be it from farm animals or human settlement. Phosphorus binds to the ground and is not easily washed out, despite a hefty application on agricultural lands, hence the low concentration in the Orange River as well. However, the nitrogen concentration is high, indicating a release from agriculture, but not as high is as elsewhere in the region. It is surmised that upstream of the sampling point, from a drainage line now transformed into a canal, a volume of irrigation return flow is flowing into the Orange River.

Present Ecological Status - The river at Kakamas, as elsewhere, has been impacted by major dams, large-scale water abstractions, an influx of agricultural chemicals, encroachment of reeds and exotic macrophytes, translocated and exotic fish, levees, bridges and many other infarctions. Hence the river was scored a C, which signifies that it has been impacted, but despite these impacts still exhibits appreciable ecological functioning. The riparian zone scores a D, which signifies that ecological functioning has been lost.

Ecological Importance - The Orange River is most important, according to this assessment. Twelve species of fish occur in the Lower Orange River, as well as 3 exotic species.

Three are endangered to some extent; *Labeobarbus kimberleyensis, Austroglanis sclateri, and Pseudocrenilabrus philander.*

The only one that causes real concern in the largemouth yellow fish *Labeobarbus kimberleyensis*. It is endemic to the Orange River system and hence is threatened not only on a local scale, but on a national scale as well. This puts the Lower Orange in category 4. This renders the Orange River as important.

Ecological Sensitivity - The Orange River at Kakamas has absorbed numerous and deep-cutting human impacts. Yet is still functions as an aquatic ecosystem. In the highly improbable event of ceased human impact, the river here would probably bounce back to its previous glory. In this respect the river cannot be categorised as sensitive. It is dreaded among conservation minded people that the Lower Orange River might have some more capacity to absorb further impact.

10.3.2 IMPACT ASSESSMENT

Table 4: Freshwater Impact Assessment Summary

Possible Impact		Extent	Duration	Intensity	Significance	Probability	Confidence
Clearing of vegetation, levelling of land	Without mitigation	Regional	Medium term	High	Medium	Probable	High
	With mitigation	Local	Short term	Low	Low	Low	High
Drainage Line reconstruction	Without mitigation	Regional	Medium term	Medium	Medium	Probable	High
	With mitigation	Local	Short term	Low	Low	Low	High
Installation of infrastructure, irrigation	Without mitigation	Regional	Medium term	Medium	Medium	Probable	High
	With mitigation	Local	Short term	Low	Low	Low	High
Operation of vineyards	Without mitigation	Regional	Long term	Medium	High	Probable	High
	With mitigation	Local	Long term	Low	Low	Low	High

10.3.3 MITIGATION MEASURES

The following mitigation measures pertaining to the drainage line are recommended:

- No activities should be allowed outside of the demarcated agricultural development area. Machinery, waste and rubble should not be allowed to accumulate anywhere in the natural vegetation.
- The main threat because of the establishment of the agricultural development is the movement of sediments down the drainage line and into the Orange River. The land would be entirely transformed by heavy earth moving machinery, as is required for the establishment of vineyards in virgin land. This transformation should be affected during the dry season, when the likelihood of sudden thunder storms is at its least.
- Any signs of erosion in the altered drainage line should be addressed immediately after downpours. Eroded areas should be filled in and the compacted. It should be planted with suitable vegetation. Irrigation may be required to establish this vegetation. If necessary, berm and contours should be constructed to direct storm water away to less susceptible areas.
- The flow path of the drainage line should remain the same as far as possible, despite of the agricultural development.

- Agricultural waste and other waste and litter should not be allowed to pass down the channel.
- Vehicles and other disturbances should be kept out of the altered drainage lines as to prevent any disturbance that could result in erosion.

The Agricultural Development Report (**Appendix 4A**) has also recommended that the main drainage lines be left open to make provision for flooding events.

The following mitigation measures pertaining to the Orange River are recommended:

- The single most threat to the Orange River during the subsequent end use is the agricultural return flow because of over-irrigation. This is overly evident in many of these originally dry natural drainage lines turned into agricultural drainage channels. The impact on river's water quality is negative and deleterious. It is therefore expected that the ground moisture levels will be scientifically monitored and that irrigation will be adjusted accordingly, with return flow limited, if not eliminated altogether.
- According to what has been witnessed during site visits in the Lower Orange River catchment it was evident that farming practices and in particular the level of management differ widely. The volume of agricultural return flow is perhaps the most telling criterium.
- It is also evident that best practice and in particular control can be most effective to limit the impact of the downstream aquatic environment. From current practice on the property it is evident that best practice is entirely within Triple D's ability and that this company can be trusted to continue to implement such practices. The probability of mitigating measures to be successful is evident.

10.3.4 CONCLUSION

An anthropogenic activity can impact on any of the ecosystem drivers or responses and this can have a knock-on effect on all of the other drivers and responses. This, in turn, will predictably impact on the ecosystem services.

The driver of the drainage line is the occasional flood that follows sudden and intense rainfall events. This is followed by prolonged droughts and intense summer heat that prevents the development of any viable aquatic habitat. This is apart from shallow ground water that explains the growth of a somewhat more prolific vegetation along the drainage lines. These plants are by no means an indication of aquatic or riparian habitat. The Triple D drainage line's riparian vegetation is not taller than that of the surrounding landscape and therefore does not add much to habitat variation.

The planned agricultural expansion would obviously and greatly alter the drainage line. However, the Triple D drainage line is not important in terms of aquatic habitat, aquatic biodiversity and economic footprint. The envisaged alteration would therefore not be a significant loss. Apart from this, the banks of the Orange River are already heavily exploited, with little habitat that has not been impacted upon in a varying degree.

A note from the DWS dated 18 July 2018 stated that drainage lines are "extremely sensitive to development". The DWS did not, by any means, rule out development over drainage lines.

The DENC, on the other hand, in their note dated 9 March 2019, stated that disturbance of ephemeral rivers is "strongly prohibited". This effectively rules out any further development in the Lower Orange

River, as drainage lines are densely distributed over the landscape. Numerous developments are in various stages of completion, representing literally billions of Rands worth of investment.

The question arises if this ruling has been promulgated as a provincial ordinance or regulation in terms of an ordinance, or only stands as departmental policy.

The conservation of drainage lines along the Lower Orange River deserves and demands attention by decision-making authorities, environmental practitioners, the conservation and farming community alike. As more of these drainage lines are impacted upon, and because impacts are radical by nature, because sections of drainage lines are replaced by vineyards or other forms of agriculture, or transformed into return flow infrastructure, the necessity for a widely accepted conservation policy becomes urgent as development escalates.

A percentage of still unimpacted drainage lines should be identified, prioritised and set aside for conservation. Only specified practices with no or limited impacts should be allowed in these sub-catchments and their drainage lines.

It remains for the decision-making authorities to decide if the proposed agricultural developments in the Lower Orange River are acceptable and if they should go ahead. Since impacts are already evident and since a vast amount of money has already been invested in this venture, with many job opportunities at stake, the proposed development should go ahead, but the eminent approval would increase the urgency and pressure for a known and accepted Lower Orange River Drainage Lines conservation policy.

It is therefore recommended that the agricultural development should go ahead, subject to a General Authorisation, or even an official letter of consent.

11. SUMMARY OF IMPACTS

Please refer to Appendix 7 for a summary of the project impact assessment and significance, including a summary of mitigation measures.

Table 5 is a summary of all the impacts assessed in the specialists reports that are associated with the construction and operational phase for the preferred alternative.

Table 5: Summary of all impacts

Study	Impact	Significance No Mitigation	Significance With Mitigation
Botanical	**Geology & soils:** Potential impact on special habitats (e.g. true quartz or "heuweltjies")	Insignificant (Negative impact)	Insignificant (Negative impact)
	Landuse and cover: Potential impact on socio-economic activities.	Insignificant (Negative impact)	Insignificant (Negative impact)
	Vegetation status: Loss of vulnerable or endangered vegetation and associated habitat.	Medium Low (Negative impact)	Low (Negative impact)
	Conservation priority: Potential impact on protected areas, CBA's, ESA's or Centre's of Endemism.	Medium Low (Negative impact)	Low (Negative impact)
	Connectivity: Potential loss of ecological migration corridors.	Medium Low (Negative impact)	Low (Negative impact)
	Watercourses and wetlands: Potential impact on natural water courses and it's ecological support areas.	Medium High (Negative impact)	Low (Negative impact)
	Protected & endangered plant species: Potential impact on threatened or protected plant species.	Medium Low (Negative impact)	Low (Negative impact)
	Invasive alien plant species: Potential invasive plant infestation as a result of the activities.	Low (Negative impact)	Insignificant (Negative impact)
	Veld fire risk: Potential risk of veld fires as a result of the activities.	Low (Negative impact)	Insignificant (Negative impact)
	Cumulative impacts: Cumulative impact associated with proposed activity.	Medium High (Negative impact)	Medium Low (Negative impact)

	The "No-Go" option: Potential impact associated with the No-Go alternative.	Low (Negative impact)	
Heritage	Loss of Heritage resources	Negligible (Negative impact)	No Impact
Palaeontology	Loss of Palaeontological heritage resources	No Impact	No Impact
Freshwater	Clearing of vegetation, levelling of land	Medium (Negative impact)	Low (Negative impact)
	Drainage Line reconstruction	Medium (Negative impact)	Low (Negative impact)
	Installation of infrastructure, irrigation	Medium (Negative impact)	Low (Negative impact)
	Operation of vineyards	High (Negative impact)	Low (Negative impact)
Social	Job Creation	Low (Positive Impact)	N/A

12. RECOMMENDATIONS

The following mitigation measures must be enforced if the proposed development were approved. These are also included in the Environmental Management Programme (**Appendix 6**).

Construction and Operational Phases:

The following mitigation actions should be implemented to ensure that the proposed development does not pose a significant threat to the environment:

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies.
- The proposed 60 ha development must be located within the >100 ha area that was investigated in such a way that the impact on the more significant water courses (and its associated riparian vegetation) and the 4 protected trees (Sheppard- and Quiver trees) are minimised.
- It is recommended that a **minimum buffer of at least 3 – 5 m is established next to these water courses**, measured from the edge of the water course (not the centre of the water course) in order to protect the existing riparian vegetation. Access road may not intrude into these buffer zones. In other words the access road may not form the buffer zone, but must be placed away from the water course and outside of this buffer zone.
- Ideally the development should be placed to minimise the impact on these water courses, while at the same time leaving a north-south migration corridor (for instance a 30m corridor associated with the main western water course).
- The two ***Boscia albitrunca*** **trees** should be protected, in location, if at all possible. Since these trees transplant poorly, search & rescue is not considered a viable option. If they have to be removed, permits must be obtained in terms of the National Forest Act (NFA) and the Northern Cape Nature Conservation Act (NCNCA).
- The two ***Aloidendron dichotomum*** **trees** should be protected, ideally in location, if at all possible. However, these trees can be transplanted and search and rescue may be an option. However, if they are moved, a permit for their re-location must be obtained in terms of the NCNCA and they must be transplanted back within the immediate surroundings. The transplantation must be overseen by a botanist or suitably qualified person and a watering program must be implemented to support these trees until they have re-established themselves.
- The Search & Rescue recommendations given in Table 5 of the Botanical Impact Assessment must be implemented with regards to other protected species encountered and a DENC flora permit must be obtained in terms of the NCNCA.
- Future farm roads must be approved by the ECO and may not impact on the buffer zones next to the streams.
- Before any work is done the 60 ha development footprint, future roads and access routes must be clearly demarcated (to ensure the above mitigation measures are correctly interpreted) and approved by the ECO. The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.

- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.
- Indiscriminate clearing of any area outside of the construction footprint must be avoided.
- All areas impacted as a result of construction must be rehabilitated on completion of the project.
  - This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material.
  - It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment.
- An integrated waste management approach must be implemented during construction.
  - Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
  - All rubble and rubbish should be collected and removed from the site to a suitable registered waste disposal site.
- The pipeline route must be adjusted to minimise the impact on any large indigenous tree that might be encountered along its route and the construction footprint must be minimised as much as possible.

According to the Heritage Impact Assessment, based on the assessment of the potential impact of the development on the identified heritage, the following recommendations are made, taking into consideration any existing or potential sustainable social and economic benefits:

- The lithic traces on the landscape of the study area are of low significance and the impact of the development on these resources are inconsequential. No further mitigation is required. Therefore, from a heritage point of view we recommend that the proposed development can continue.
- Due to the low palaeontological significance of the area, no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils. It is considered that the development of the proposed development is deemed appropriate and feasible and will not lead to detrimental impacts on the palaeontological resources of the area. If fossil remains are discovered during any phase of construction, either on the surface or unearthed by fresh excavations, the ECO in charge of these developments ought to be alerted immediately. These discoveries ought to be protected (preferably in situ) and the ECO must report to SAHRA so that appropriate mitigation (e.g. recording, collection) can be carry out by a professional palaeontologist.
- Although all possible care has been taken to identify sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the assessment. If during construction, any possible discovery of finds such as stone tool scatters, artefacts, human remains, or fossils are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find.

The following mitigation measures pertaining to the drainage line are recommended:

- No activities should be allowed outside of the demarcated agricultural development area. Machinery, waste and rubble should not be allowed to accumulate anywhere in the natural vegetation.
- The main threat because of the establishment of the agricultural development is the movement of sediments down the drainage line and into the Orange River. The land would be entirely transformed by heavy earth moving machinery, as is required for the establishment of

vineyards in virgin land. This transformation should be affected during the dry season, when the likelihood of sudden thunder storms is at its least.

- Any signs of erosion in the altered drainage line should be addressed immediately after downpours. Eroded areas should be filled in and the compacted. It should be planted with suitable vegetation. Irrigation may be required to establish this vegetation. If necessary, berm and contours should be constructed to direct storm water away to less susceptible areas.
- The flow path of the drainage line should remain the same as far as possible, despite of the agricultural development.
- Agricultural waste and other waste and litter should not be allowed to pass down the channel.
- Vehicles and other disturbances should be kept out of the altered drainage lines as to prevent any disturbance that could result in erosion.

The Agricultural Development Report has also recommended that the main drainage lines be left open to make provision for flooding events.

The following mitigation measures pertaining to the Orange River are recommended:

- The single most threat to the Orange River during the subsequent end use is the agricultural return flow because of over-irrigation. This is overly evident in many of these originally dry natural drainage lines turned into agricultural drainage channels. The impact on river's water quality is negative and deleterious. It is therefore expected that the ground moisture levels will be scientifically monitored and that irrigation will be adjusted accordingly, with return flow limited, if not eliminated altogether.
- According to what has been witnessed during site visits in the Lower Orange River catchment it was evident that farming practices and in particular the level of management differ widely. The volume of agricultural return flow is perhaps the most telling criterium.
- It is also evident that best practice and in particular control can be most effective to limit the impact of the downstream aquatic environment. From current practice on the property it is evident that best practice is entirely within Triple D's ability and that this company can be trusted to continue to implement such practices. The probability of mitigating measures to be successful is evident.

13. CONCLUSIONS

The following specialist studies were undertaken as part of this Environmental Impact Assessment:

- Botanical Impact Assessment
- Heritage Impact Assessment
- Freshwater Impact Assessment

The specialist studies and the information provided within the EIA Report, indicates that the proposed Triple D agricultural development does not pose any significant impacts and can be implemented with appropriate mitigation.

In terms of the need and desirability of the proposed development, Triple D Farms is one of the leading export table grape farms along the Orange River. The company not only contributes to the Northern Cape economy but is also a preferred employer. The development of the property under consideration is therefore crucial to ensure sustainability and further job creation.

The proposed development is expected to have CAPEX value of approximately R22 764 000 on completion. The development is also expected to create approximately 120 jobs opportunities during the construction phase, and 600 jobs opportunities during the operational phase. 100% of the job opportunities will be towards previously disadvantaged individuals, and the expected employment opportunities will have a current value of approximately R48 964 000 during the first 10 years.

The proposed location is considered to be ideal, as it is adjacent to Triple D's existing vineyards and close to the existing Triple D offices and packing shed. The site also has easy and direct access to the N14.The site is located approximately 1km south of the Orange River, and therefore relatively close to the source of water for irrigation.

An Agricultural development report concluded that the site has a medium – low agricultural potential naturally for the cultivation of perennial crops, and would require soil preparation.

In terms of alternatives, the proposed site and the activity are the only viable options for the Applicant at this stage, and as such, no further Alternatives were investigated.

This is the option of not developing the area for grape production. The current status quo will remain. Although this might result in no potential negative environmental impacts, the direct and indirect socio-economic benefits of not developing the site for grape production will not be realised. The job opportunities and expected contribution to the region's economy would not be realised. The no-go option would only be recommended if it were found that the proposed development on this site or in this area might potentially cause substantial detrimental harm to the environment.

According to the Botanical Impact Assessment, the proposed development will result in the transformation of approximately 60 ha of natural vegetation (Least Threatened) within a proposed CBA area. It will also potentially impact on a number of significant water courses and its associated riparian vegetation, as well as 2 *Boscia albitrunca* (Protected in terms of the NFA) and 2 *Aloidendron dichotomum* trees (a red listed plant, and protected in terms of the NCNCA). In addition, it is also likely to impact on a number of other NCNCA plant species.

The development could therefore have a medium/high impact on the environment, but with mitigation it can be reduced significantly to medium/low and is thus very important that the mitigation actions described above are implemented. With the correct mitigation it is likely that the development will then not contribute significantly to any significant loss of vegetation type and associated habitat, loss of ecological processes, loss of local biodiversity and threatened plant species or loss of ecosystem connectivity.

According to the Freshwater Impact Assessment, the planned agricultural expansion would obviously and greatly alter the existing drainage line on site. However, the Triple D drainage line is not important in terms of aquatic habitat, aquatic biodiversity and economic footprint. The envisaged alteration would therefore not be a significant loss. Apart from this, the banks of the Orange River are already heavily exploited, with little habitat that has not been impacted upon in a varying degree. The overall impact on freshwater resources is considered to be Low (with mitigation).

According to the Heritage Impact Assessment, identified archaeological materials are of low significance, as the archaeological sample is small and without context, and therefor of little scientific value. In the development footprint are no archaeological, historical or cultural sites that will be impacted on negatively by the proposed development. Since no archaeological, historical or cultural sites that will be impacted on negatively by the proposed development, the impact of the proposed development on heritage resources is considered negligible.

Considering all the information, it is not envisaged that this proposed Triple D agricultural development will have a significant negative impact on the environment, and the socio-economic benefits are expected to outweigh any negative impacts. The negative impacts can also be mitigated to a satisfactory degree.

It is therefore recommended that the proposed development be supported and be authorised with the necessary conditions of approval, subject to the implementation of the recommended enhancement and mitigation measures contained in Section 12.

14. DETAILS AND EXPERTISE OF THE EAP

Details of Environmental Assessment Practitioner, expertise and Curriculum Vitae

This Draft Environmental Impact Report was prepared by Clinton Geyser who has a MSc. Degree in Environmental Management. He has been working as an Environmental Assessment Practitioner since 2009 and is currently employed at EnviroAfrica CC.

Report compiled by Clinton Geyser -
Qualifications:

- BSc. Earth Sciences, Majors in Geology and Geography and Environmental Management (1998 – 2000) and;
- BSc. (hons): Geography and Environmental Management (2001) and;
- MSc. Geography and Environmental Management (2002), all from the University of Johannesburg.

Expertise:
Clinton Geyser has over seven years' experience in the environmental management field as an Environmental Assessment Practitioner and as an Environmental Control Officer, having worked on a variety of projects in the Western, Eastern and Northern Cape. Previous completed applications include, but not limited to:

- Civil engineering infrastructure including pipelines, Waste Water Treatment Works, and roads in the Western and Northern Cape.
- Agricultural developments, including reservoirs and dams, in the Western and Northern Cape.
- Telecommunications masts in the Western and Eastern Cape
- Housing Developments in the Western and Northern Cape.
- Resort developments in the Western and Northern Cape.
- Cemeteries in the Western Cape
- Waste Management Licences in the Western Cape

Employment:
Previous employment as an EAP: Doug Jeffery Environmental Consultants (2009 – 2012)
Current employment: EnviroAfrica cc (2012 – present).

The whole process and report was supervised by Bernard de Witt who has more than 20 years' experience in environmental management and environmental impact assessments.

(----------END----------)