Socio-Economic Impact Assessment Report for the Proposed KTE Brandvlei Water Pipeline Project, within the Northern Cape Province

For

EnviroAfrica NC CC

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CONTROL SHEET

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ENVIRONMENTAL IMPACT ASSESSMENT (EIA) PROCESS OBJECTIVES

The objective of the EIA process is to, through a consultative process -

- Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- Identify the alternatives considered, including the activity, location, and technology alternatives;
- Describe the need and desirability of the proposed alternatives,
- Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
    - The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
    - The degree to which these impacts -
- can be reversed;
- may cause irreplaceable loss of resources; and
- can be managed, avoided or mitigated;

- Through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to -

- identify and motivate a preferred site, activity and technology alternative;
- identify suitable measures to manage, avoid or mitigate identified impacts; and
- identify residual risks that need to be managed and monitored.

STATEMENT OF INDEPENDENCE

Neither ETC nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of ETC.

ETC has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

SPECIALIST DECLARATION

Full Name	**Title/Position**
Marvin Gabara	Environmental Consultant
Telephone Number	**Email Address:**
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Qualification(s):	Bachelor of Environmental Sciences
Experience (years):	4
Registration(s)	• EAPASA: 2022/5305 • SACNASP: 150157

I, Marvin Gabara, declare that: –

- I act as an independent specialist in this application;
- I will perform the work relating to the application objectively, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;

- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken concerning the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offense and is punishable by law.

28/05/2024

Signature of the Specialist Date

Findings, recommendations, and conclusions provided in this report are based on the best available scientific methods and the author's professional knowledge and information at the time of compilation. The author of this report, however, accepts no liability for any actions, claims, demands, losses, liabilities, costs, damages, and expenses arising from or in connection with services rendered, and by the use of the information contained in this document.

No form of this report may be amended or extended without the prior written consent of the author and/or a relevant reference to the report by the inclusion of an appropriately detailed citation.

Any recommendations, statements, or conclusions drawn from or based on this report must cite or refer to this report. Whenever such recommendations, statements or conclusions form part of the main report relating to the current investigation, this report must be included in its entirety.

SPECIALIST AFFIRMATION

I, Marvin Gabara, swear under oath/affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

28/05/2024

Signature of the Specialist Date

EXECUTIVE SUMMARY

INTRODUCTION

Eco-Thunder Consulting (ETC) was commissioned by EnviroAfrica NC CC (EnviroAfrica) as the lead consultant to manage the Socio-Economic Impact Assessment (SEIA) process for the establishment of the proposed Kotulo Tsatsi Energy (Socio-Economic Impact Assessment Report for the Proposed KTE Brandvlei Water Pipeline Project, within the Northern Cape Province.

Given the increasing demand for water security and the limitations of existing infrastructure, the proposed pipelines construction is now required. Thus, to fortify the supply network in the area and thereby meet future demand, the proposed project intends to reinforce the current network by building a 72-km pipeline with a 250mm diameter and related infrastructure.

The routes pass through a variety of agricultural regions that are all situated within two district municipalities. The municipalities affected by the proposed KTE Brandvlei Water Pipeline Project include the District Municipalities of Namakwa and ZF Mgcawu and Local Municipalities of Hantam and Kai !Garib. These areas are characterised by varying degrees of economic development challenges, varying levels of income and underdeveloped infrastructure.

This report contains the findings of the SEIA undertaken as part of the broader Environmental Impact Assessment (EIA) process.

APPROACH TO STUDY

The approach to the SEIA is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on international best practices.

The key activities in the SEIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project.
- Collecting baseline data on the current social and economic environment.
- Identifying the key potential social issues associated with the proposed project. This requires a site visit to the area and consultation with affected individuals and communities. As part of the process, a basic information document was prepared and made available to key interested and affected parties. The aim of the document was to inform the affected parties of the nature and activities associated with the construction and operation of the proposed development to enable them to better understand and comment on the potential social issues and impacts.
- Assessing and documenting the significance of socio-economic impacts associated with the proposed intervention.

- Identifying alternatives and mitigation measures.

COLLECTION AND REVIEW OF EXISTING INFORMATION

Existing desktop information that has relevance to the proposed project, project area and/or surroundings was collected and reviewed. The following information was examined as part of this process:

- Documentation and KML files supplied by the client;
- Terms of Reference (ToR) for the socio-economic specialist;
- Photographs, interviews, and information captured during the site visit;
- Google Earth Earth software and data (aerial imagery - 2018);
- Sentinel-2 Satellite Imagery (2018);
- SRTM Digital Elevation Model;
- Census Data and other socio-economic statistics;
- Stakeholder engagement records and feedback;
- Planning documentation such as Provincial Growth and Development Strategies (PGDSs), Local and District Municipality Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and development goals and objectives; and
- Relevant legislation, guidelines, policies, plans, and frameworks.

The identification of potential socio-economic issues associated with the proposed KTE Brandvlei Water Pipeline Project is based on primary and secondary information about the area and visits to the relevant communities and town by field workers/members of the SEIA study team.

KEY FINDINGS

From a socio-economic perspective it is concluded that the proposed KTE Brandvlei Water Pipeline Project is supported, but that mitigation measures should be implemented and adhered to. Positive and negative socio-economic impacts have been identified. The assessment of the key issues indicated that there are no negative impacts that can be classified as fatal flaws, and which are of such significance that it cannot be successfully mitigated. Positive impacts could be enhanced by implementing appropriate enhancement measures and through careful planning.

Based on the socio-economic impact assessment, the following general conclusions and findings can be made:

- The development of the proposed Project is a critical step in addressing the socio-economic challenges faced by residents. The assessment identified key issues such as inadequate access to water, sanitation, and safety concerns. By developing these services, the project aims to improve living conditions, enhance safety, and provide equal opportunities for all residents.

- The proposed development aligns with the national, provincial, and local policy frameworks, emphasizing the importance of inclusive housing development, improved service delivery, and sustainable urban development. It supports the goals outlined in the National Development Plan and various housing policies, which prioritise the provision of basic services and the enhancement of living conditions in informal settlements.
- The development of the proposed pipeline will have positive socio-economic impacts. Job creation is expected during the construction phase, stimulating local economic activity through the procurement of construction materials and services. It also offers opportunities for skills development and training for the local labour force, contributing to improved employment prospects and income generation. The project will result in enhanced access to basic services and amenities, improving the standard of living and quality of life for affected communities.
- The stakeholder engagement process played a vital role in shaping the proposed KTE Brandvlei Pipeline Project. Community members and other stakeholders provided valuable insights and feedback, highlighting the importance of basic services, job opportunities, and addressing major socio-economic issues.
- Mitigation measures are necessary to address potential negative impacts associated with the construction and operational phases. Temporary inconveniences and disruptions during construction should be minimised through effective project management and communication. Challenges in managing and maintaining the formalised services effectively require the implementation of efficient management practices, ongoing monitoring, and community engagement. Measures should also be in place to manage and resolve potential conflicts or disputes related to the allocation of formalised services.
- The cumulative impacts of the project can contribute to sustained economic growth, improved infrastructure development, and enhanced local services. Economic growth will be driven by job creation, increased business activity, and revenue generation. Infrastructure development can result in improved transportation networks, utilities, and community facilities, enhancing access to services.
- However, the cumulative impacts also present challenges that need to be addressed. The increased demand on resources, including water, energy, and land must be managed efficiently to prevent scarcity. Measures should be in place to minimise social displacement and avoid exacerbating socio-economic inequalities.
- By considering diverse viewpoints and suggestions, the final Socio-Economic Impact Assessment (SEIA) will provide a comprehensive analysis of potential socio-economic impacts. This will ensure that decision-makers have a complete understanding of the project's implications, enabling them to make informed decisions that maximise benefits and minimise adverse effects.
- The proposed KTE Brandvlei Water Pipeline development in the Northern Cape province can assist in addressing socio-economic challenges, enhancing quality of life,

promoting equitable development, and creating sustainable opportunities for the community. By considering affordability, implementing mitigation measures, and engaging stakeholders, the project can maximise its positive impacts while minimising any negative consequences. The project's alignment with policy frameworks and its potential to contribute to sustained economic growth, improved infrastructure, and enhanced local services make it a promising endeavour for the socio-economic development of the area.

CONCLUSION

During the Assessment Phase of the Socio-Economic Impact Assessment (SEIA), a comprehensive site visit was conducted to gather valuable insights and engage with key stakeholders and interested and affected parties.

The primary objective of the site visit was to provide stakeholders with a clear understanding of the proposed development, including its location, scope, and planned activities during both the construction and operational phases. To facilitate effective communication, visual aids such as maps and diagrams were utilised to illustrate the project's spatial aspects and provide stakeholders with a tangible representation of the planned development.

The feedback received from the site visit/surveys plays a crucial role in informing the analysis of the project's socio-economic impacts. By incorporating stakeholder perceptions and concerns, the assessment can provide a comprehensive understanding of the potential positive and negative socio-economic effects associated with the proposed development.

Through a rigorous review of policies, stakeholder engagement processes, and data analysis, this assessment has identified key socio-economic issues at various levels and examined the positive and negative impacts during the construction and operational phases.

At the district and local levels, the assessment identified challenges related to infrastructure, basic service provision, economic opportunities, and community development. These findings highlight the importance of coordination, capacity building, and effective implementation at the local level. By engaging with local municipalities, addressing land tenure issues, and ensuring transparency and accountability, the project can promote sustainable development and enhance the quality of life in the target communities.

The assessment also acknowledged the significance of enhanced access to basic services, amenities, and infrastructure development in informal settlements. These positive impacts can lead to improved living conditions, increased social inclusion, and enhanced community development. However, it is crucial to address potential challenges such as temporary inconveniences, disruptions to local businesses, and the risk of short-term social and economic challenges for affected residents. By implementing mitigation measures, such as effective project scheduling, stakeholder engagement, and support mechanisms, these negative impacts can be minimised.

The proposed project is unlikely to result in permanent damaging socio-economic impacts. From a socio-economic perspective, it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the report, it is the reasoned opinion of the specialist that the project can be authorised.

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LIST OF ABBREVIATIONS

Abbreviations	Description
DFFE	Department of Forestry, Fisheries and the Environment
DoE	Department of Energy
DM	District Municipality
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GDP	Gross Domestic Product

Abbreviations	Description
GNR	Government Notice
HLM	Hantam Local Municipality
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEP	Integrated Energy Plan
IRP	Integrated Resource Plan
KGLM	Kai !Garib Local Municipality
km	Kilometre
LM	Local Municipality
NDM	Namakwa District Municipality
NDP	National Development Plan
NEMA	National Environmental Management Act (No. 107 of 1998)
O&M	Operation and Maintenance
PGDS	Provincial Growth and Development Strategy
PICC	Presidential Infrastructure Coordinating Committee
PSDF	Provincial Spatial Development Framework
SDF	Spatial Development Framework
SEIA	Socio-Economic Impact Assessment
ZFMDM	ZF Mgcawu District Municipality

SPECIALIST CHECKLIST

No.	NEMA 2014 (as amended) Regs - Appendix 6(1) Requirement	Report Section
	A specialist report prepared in terms of these Regulations must contain—	
a	details of— • the specialist who prepared the report; and • the expertise of that specialist to compile a specialist report including a curriculum vitae.	Specialist Details
b	a declaration that the specialist is independent in a form as may be specified by the competent authority;	Specialist Declaration
c	an indication of the scope of, and the purpose for which, the report was prepared;	Section 1
	an indication of the quality and age of base data used for the specialist report	Section 1.3
	a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change	Section 7
d	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3
e	a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 3
f	details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternative;	Section 6.2
g	an identification of any areas to be avoided, including buffers;	Section 7.2
h	a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 5.2

No.	NEMA 2014 (as amended) Regs - Appendix 6(1) Requirement	Report Section
l	a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.5
j	a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 9.1
k	any mitigation measures for inclusion in the EMPr;	Section 8
l	any conditions for inclusion in the environmental authorisation;	Section 7
m	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 8
n	a reasoned opinion— • whether the proposed activity, activities or portions thereof should be authorised. • regarding the acceptability of the proposed activity or activities; and • if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan.	Section 9.2
o	a description of any consultation process that was undertaken during the course of preparing the specialist report;	Section 4.2
p	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Section 9.3 Photo 1 Appendix A
q	any other information requested by the competent authority.	N/A

1 Background

Eco-Thunder Consulting (Pty) Ltd (ETC) was commissioned by EnviroAfrica NC CC NC CC (EnviroAfrica) as the lead consultant to manage the Socio-Economic Impact Assessment (SEIA) process for the establishment of the proposed Socio-Economic Impact Assessment Report for the Proposed KTE Brandvlei Water Pipeline Project, within the Northern Cape Province and Associated Infrastructure within the Northern Cape Province.

This report contains the findings of the SEIA undertaken as part of the broader EIA process.

1.1 Terms of Reference

A specialist study is required to establish the socio-economic baseline and to identify and potential socio-economic impacts arising from the proposed development based on the general requirements for a comprehensive SEIA. The SEIA has been completed in terms of NEMA Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) Appendix 6: Specialist Reports.

The following terms of reference were established:

- **Baseline Study**: Conduct a socio-economic baseline study to understand the current conditions in the project area.
- **Stakeholder Engagement**: Identify and engage with key stakeholders to understand their views and concerns related to the project.
- **Impact Assessment**: Identify and assess potential socio-economic impacts, both positive and negative, arising from the project.
- **Mitigation and Enhancement**: Develop measures to mitigate negative impacts and strategies to enhance positive impacts.
- **Monitoring Plan**: Develop a plan to track the implementation of measures and monitor actual Socio-economic impacts post-project.
- **Compliance**: Ensure the SEIA complies with relevant legislation, guidelines, and best practices.
- **Reporting**: Prepare a comprehensive, clear, and concise SEIA report suitable for submission to relevant authorities.

1.1.1 Objectives of Study

This SEIA Report has been prepared as part of the Environmental Impact Assessment (EIA) process being undertaken for the proposed KTE Brandvlei Water Pipeline Project and associated infrastructure. The purpose of this SEIA Report is to provide details on the nature and extent of development and the potential socio-economic impacts associated with the construction, operation, and decommissioning of the project. The inputs contained within this SEIA Report are intended to provide a high-level overview of the socio-economic environment

within which the project is proposed and identify potential socio-economic issues which will be addressed in detail as part of the EIA process specialist investigations.

The objective of this SEIA Report is therefore to:

- Identify and review policies and legislation which may have relevance to the activity from a socio-economic perspective.
- Provide comment on the need and desirability of the proposed activity from a socio-economic perspective.
- Identify potential impacts and risks associated with the preferred activity and technology alternatives.
- Identify key socio-economic issues to be addressed in the EIA phase.
- Agree on the level of assessment to be undertaken, including the methodology to be applied to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site.
- Identify suitable measures to avoid, manage or mitigate identified socio-economic impacts and determine the extent of residual risks that need to be managed and monitored.

1.2 Structure of the Report

The report is organised into nine sections:

- Section 1.6: Background;

1.3 Section 1.7: Level of Confidence

Level of confidence is determined as a function of:

The information available, and understanding of the study area by the practitioner:

- 3: A high level of information is available of the study area and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.
- 2: A moderate level of information is available of the study area and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.
- 1: Limited information is available of the study area and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.

The information available, understanding of the study area and experience of this type of project by the practitioner:

- 3: A high level of information and knowledge is available of the project and the visual impact assessor is well experienced in this type of project and level of assessment.
- 2: A moderate level of information and knowledge is available of the project and/or the visual impact assessor is moderately experienced in this type of project and level of assessment.
- 1: Limited information and knowledge is available of the project and/or the visual impact assessor has a low experience level in this type of project and level of assessment.

The level of confidence for this assessment is determined to be 9 and indicates that the author's confidence in the accuracy of the findings is high.

- Project Description;
- Section 3: Approach and Methodology;
- Section 3: Legislation and Policy Review;
- Section 5: Socio-Economic Profile
- Section 6: Key Social Impacts
- Section 7: Impacts and Assessment
- Section 8: Monitoring and Compliance (EMPr)
- Section 9: Environmental Impact Statement
- Section 10: References

1.4 Information Base

The following information was used to conduct the SEIA:

- Documentation and KML files supplied by the client;
- Terms of Reference (ToR) for the socio-economic specialist;
- Photographs, interviews, and information captured during the site visit;
- Google Earth software and data (aerial imagery - 2018);
- Sentinel-2 Satellite Imagery (2018);
- SRTM Digital Elevation Model;
- Census data and other socio-economic statistics;
- Stakeholder engagement records and feedback;
- Planning documentation such as Provincial Growth and Development Strategies (PGDSs), Local and District Municipality Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and development goals and objectives; and
- Relevant legislation, guidelines, and best practices for Socio-economic impact assessment.

1.5 Seasonal Change

In terms of Appendix 6 of the 2014 EIA Regulations, a specialist report must contain information on "the date and season of the site investigation and the relevance of the season to the outcome of the assessment". The site visit was undertaken from the 13th of March 2024. The season in which the site visit was undertaken does not have any considerable effect on the significance of the impacts identified, the mitigation measures, or the conclusions of the assessment, since the vegetation cover does not vary significantly over the seasons.

1.6 Limitations and Assumptions

The following assumptions and limitations are applicable to this SEIA Report:

- It was assumed that information provided by EnviroAfrica and KTE was accurate and that the technical specifications of the Project and site selection are in accordance with the relevant requirements.
- The assessment has been based on the requirements of the Western Cape Environmental Affairs & Development Planning Guidelines.[1]

[1] These guidelines are based on international best practice and are applicable to all provinces within South Africa.

- The assessment assumes that all necessary consultations with stakeholders, including local communities, authorities, and other interested parties, have been / will be conducted in accordance with legal requirements, and that their views and concerns have been duly considered.
- Whilst most homesteads and housing areas were visited during the site visit in order to confirm their nature and likely socio-economic of the development, it was not possible to visit all homesteads and housing areas.
- The Project report uses the concept of 'worst case scenario' to identify issues and rate socio-economic impacts.
- Regulation 11(3) of the EIA Regulations, which suggests that if more than one activity is part of the same development, a single application may be required, discourages the practice of splitting components or assessing them in isolation, thereby promoting a unified and integrated approach to cumulative impact assessment.
- This report and assessment are dependent on the accuracy of the publicly available secondary information such as Statistics South Africa (Stats SA, 2022).
- This SEIA Report was prepared based on information that was available to the specialist at the time of preparing the report. The sources consulted are not exhaustive, and the possibility exists that additional information which might strengthen arguments, contradict information in this report, and/or identify additional information might exist.
- Some of the project projections reflected in this SEIA Report may be subject to change, and therefore may be higher or lower than those estimated by the project proponent.
- It is assumed that the motivation for the planning and feasibility study of the project were undertaken with integrity, and that information provided by the project proponent was accurate and true at the time of preparing this SEIA Report.
- The responsibility for implementing the recommendations, mitigation measures, and any other actions outlined in this report lies solely with the client or project proponent. The SEIA practitioners are not responsible for monitoring, enforcing, or ensuring compliance with these measures. It is the client's duty to ensure that all necessary permits, approvals, and consents are obtained, and that the project is carried out in accordance with all applicable laws, regulations, and standards. Any deviations from the recommendations or failure to implement the suggested measures may result in different impacts and outcomes than those described in this report.

1.7 Specialist Details

ETC is a 100% woman-owned, private company that specialises in a range of specialist studies, such as visual impact assessments, air quality impact assessments, noise impact assessments socio-economic impact assessments, socio-economic research, economic development planning, development program design and implementation as well as community trust management. Based across South Africa, Eco-Thunder has established itself

as an expert on the conditions, needs and assets of communities that are linked to independent power generation facilities.

ETC has conducted research on behalf of and advised IPPs since 2017. Its client base is thus comprised of IPPs that have been successful across all the REIPPPP bidding rounds. ETC also implements development programs in energy communities, which ensures a comprehensive understanding of the how to drive positive socio-economic impact.

1.8 Level of Confidence

Level of confidence is determined as a function of:

The information available, and understanding of the study area by the practitioner:

- 3: A high level of information is available of the study area and a thorough knowledge base could be established during site visits, surveys etc. The study area was readily accessible.
- 2: A moderate level of information is available of the study area and a moderate knowledge base could be established during site visits, surveys etc. Accessibility to the study area was acceptable for the level of assessment.
- 1: Limited information is available of the study area and a poor knowledge base could be established during site visits and/or surveys, or no site visit and/or surveys were carried out.

The information available, understanding of the study area and experience of this type of project by the practitioner:

- 3: A high level of information and knowledge is available of the project and the visual impact assessor is well experienced in this type of project and level of assessment.
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- 1: Limited information and knowledge is available of the project and/or the visual impact assessor has a low experience level in this type of project and level of assessment.

The level of confidence for this assessment is determined to be 9 and indicates that the author’s confidence in the accuracy of the findings is high.

2 Project Description

2.1 Introduction

EnviroAfrica has enlisted the services of ETC as the lead consultant to undertake the Socio-Economic Impact Assessment (SEIA) for the establishment of the proposed KTE Brandvlei Water Pipeline Project within the Northern Cape.

2.2 Project Location

Error! Reference source not found. and Figure 1 provide details pertaining to the proposed project location.

Table 1: Project Location

Province	Districts Municipalities	Local Municipalities	Wards	Nearby Communities
Northern Cape	Namakwa District Municipality (NDM)	Hantam Local Municipality (HLM)	3	Brandvlei, Rooipunt and Vendors Put
	ZF Mgcawu District Municipality (ZFMDM)	Kai !Garib Local Municipality (KGLM)	5 and 9	Upington, Witdorp, De Rust, Kenhardt, Driekop and De Bakke, Thulini, Dingimbiza, Amahwaqa, Turton and Isihlonyane

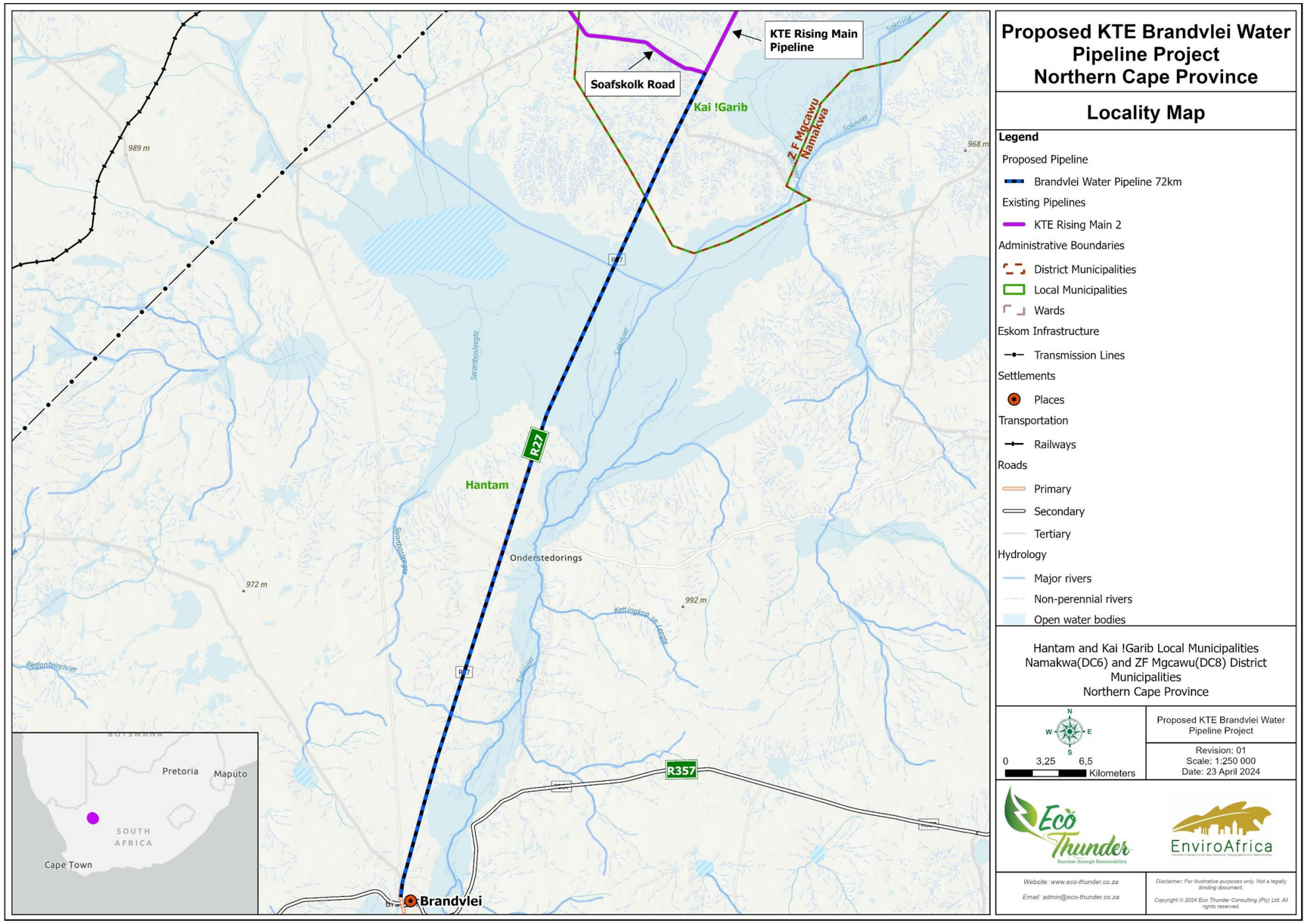


Figure 1: Locality Map: Overview

2.3 Project Technical Details

The proposed KTE Brandvlei Water Pipeline Project is an essential infrastructure development designed to enhance the water supply capacity in the Northern Cape. Spanning approximately 72km, this water pipeline project initiates from the intersection of R27 and Soafskolk Road, extending to the existing water storage reservoir in Brandvlei. Engineered to deliver around 500 cubic meters of potable water daily.

Pipeline Specifications:

- Length: 72km
- Diameter: 250mm
- Capacity: Approximately 500 cubic metres of potable water a day
- Route: Along the R27 within the western part of the road reserve

The proposed KTE Brandvlei Water Pipeline Project will be carried out in two main phases. The Construction Phase involves earthworks and the laying of pipeline sections, alongside the installation of crucial infrastructure such as pump stations and valves. The Operational Phase focuses on managing and maintaining the pipeline to ensure efficient water delivery and ongoing supply reliability.

The proposed water pipeline aims to contribute towards local communities within the Kai! Garib and Hantam Local Municipalities by providing Brandvlei with 500 cubic metres of potable water a day.

Key components of the project include strategically placed pump stations to maintain optimal water flow and pressure. Safety measures encompass shut-off valves and leak detection systems to minimise operational risks.

Fresh water supply mainly involves three key processes, collection of raw water, water treatment and distribution. Thousands of kilometres of underground pipes carry the water in a complex web-like network all around South Africa. Raw water from the impounding reservoirs is delivered by large transfer mains and tunnels to water treatment works for treatment. Treated water is then pumped through large trunk mains or tunnels to service reservoirs and then flows by gravity via the distribution network to the various buildings – residential, commercial, hotels and restaurants, factories and warehouses, etc. – and arrives at the destination of its delivery journey – the tap. The layout of the system must be carefully planned to ensure effective and efficient distribution of water to meet the demands of the users.

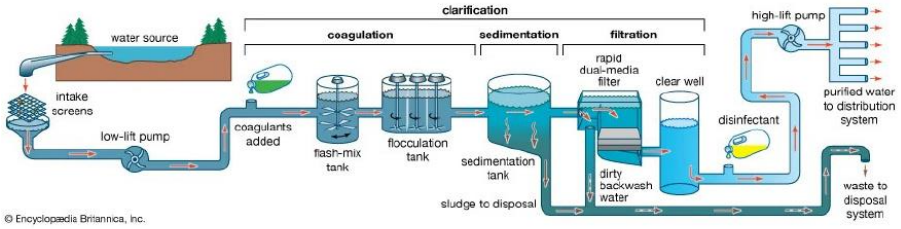


Figure 2: Bulk Water System

The proposed KTE Brandvlei Water Pipeline Project aims to address the critical need for access to clean water for residents within the Kai !Garib and Hantam Local Municipality. Bulk water systems are essential components in ensuring the reliable and clean water supply to communities. These systems are characterised by their interconnectedness, as they are designed to undertake specific tasks such as raw water collection, transportation, storage, treatment, and efficient distribution.

At the heart of the project lies the backbone, a main pipeline approximately 72km in length with a diameter of around 250mm, supported by supplementary sections to enhance existing infrastructure. Materials such as cast iron, steel, plastic, or concrete will need to be strategically chosen for durability and efficiency, adapting to varied terrains and minimising pressure loss. This meticulous planning will ensure the pipeline system optimises water transport efficiency and maintains consistent pressure across diverse landscapes, thereby reducing potential operational challenges.

Each element of the proposed KTE Brandvlei Water Pipeline Project, from the layout of the pipeline to the selection of materials and construction methodologies, will need to be tailored to meet the unique requirements and objectives of the project. This comprehensive planning will ensure that the pipeline network not only serves its immediate purpose of water distribution but also aligns with broader goals of sustainability, efficiency, and resilience against future challenges.

Figure 3: Example of a Raw Water Pipeline

Pump stations are pivotal for maintaining optimal pressure and flow across the extensive pipeline network. Given the geographical diversity of the project area, pump stations act as hydraulic solutions, addressing challenges presented by hills and valleys. This infrastructure is akin to a series of precision-engineered tools, each adept at ensuring the efficient movement of water through varying terrains.

Various types of pumps, including centrifugal, submersible, and booster pumps, may be employed based on the system's specific requirements, such as the required flow rate, head, and pressure requirements. These stations are crucial for overcoming elevation changes and ensuring consistent water delivery to all project areas. In the broader context, these pump stations are fundamental to the reliability of water distribution, ensuring consistent flow irrespective of topographical variations.

Figure 4: Riverton Pumpstation, Kimberley, Northern Cape

Figure 5: Example of Raw Water Storage

Figure 6: Prieska Wastewater Treatment Works, Northern Cape

Figure 7: Prieska Wastewater Treatment Works, Northern Cape

Acknowledging the project's implications for water quality management, the integration or augmentation of treatment facilities is vital. These facilities are essential for ensuring that water meets safety and quality standards before distribution, adapting to variations in source water quality and safeguarding public health. The Water Treatment Plants (WTPs) within the system employ a combination of traditional and advanced treatment processes to ensure the safety

and quality of the water. A notable technology in use is the clarification process, which is essential for removing suspended particles and turbidity from the water.

Figure 8 below illustrates the water cycle and the clarification process, highlighting the stages of coagulation, flocculation, sedimentation, and filtration that water undergoes before it is deemed safe for consumption and use. In addition to physical and chemical treatment processes, the plants are equipped with ultraviolet (UV) disinfection and reverse osmosis (RO) systems for the removal of pathogens and dissolved salts, respectively. These technologies are particularly vital in ensuring the adaptability of the system to various water source qualities and the changing needs of the population.

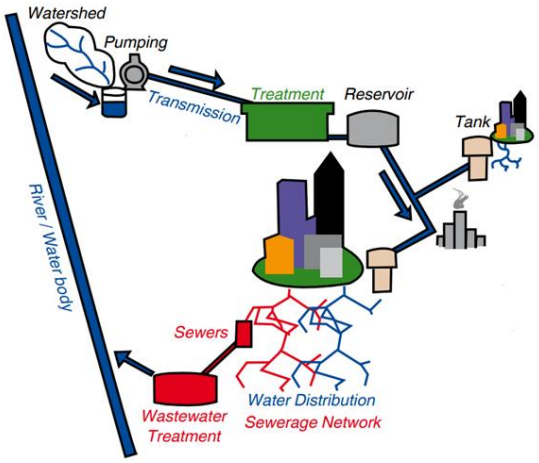


Figure 8: Clarification of the Water Cycle

Figure 9: Wastewater Treatment Plant (WWTP)

The integration and strategic placement of service reservoirs within the proposed KTE Brandvlei Water Pipeline Project are pivotal elements designed to enhance the water distribution network's efficiency and reliability. This structured approach ensures that the project not only meets the immediate water supply needs but also addresses pressure management and emergency backup requirements. The logical order of planning and the role of these reservoirs are outlined below:

Reservoirs are integral to the system's design, enabling strategic storage of water. This is essential for managing water pressure within the distribution pipes, achieved by placing the reservoirs at an elevated level to harness gravity, thereby ensuring a consistent water flow.

Serving as hydraulic control points, service reservoirs are strategically positioned to regulate the flow of water throughout the network. They function as buffers, safeguarding against fluctuations in demand or during maintenance activities, thus maintaining a stable and consistent water supply.

In the event of system disruptions, the reservoirs provide an emergency backup, ensuring that water remains available to end-users without interruption. This aspect underscores the reservoirs' critical role in the resilience and reliability of the water supply system.

For end-users, service reservoirs represent the backbone of a reliable water supply. Operating silently in the background, these reservoirs are pivotal in maintaining the seamless flow of water, a testament to the project's efficiency and the thoughtful planning behind the water distribution network's functionality.

Figure 10: Example of a Reservoir

2.3.1 No-Go Alternative

The final alternative concerns the project not proceeding. This would result in the current state remaining and future water supply in the area being compromised which would have both regional consequences.

3 Approach and Methodology

3.1 Definition of Social Impacts

"The consequences to human populations of any public or private actions (including policies, programs, plans, and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs, and generally live and cope as members of society." These effects are felt at various levels, including the individual, family or household, community, organisation, or society. Some social impacts are physically felt by the body, whereas others are perceptual or emotional" (Vanclay, 2002).

It can therefore be deduced that social change is natural and ongoing when considering social impacts (Burdge, 1995). It's also important to realise that government and private sector policies, plans, programs, and projects can affect social change's pace and direction. Social impacts are often change processes (Vanclay, 2002). For instance, temporary construction workers don't affect society. However, their presence can increase antisocial behaviour and other social issues. Understanding processes with social impacts is Vanclay's approach. Social assessment specialists must consider the complex causal mechanisms that cause social impacts. Following impact pathways, or causal chains, and considering likely interactions can reveal the full range of impacts (Vanclay, 2002).

A SEIA should thus enable authorities, project proponents, individuals, communities, and organisations to understand and anticipate the potential socio-economic consequences of implementing a proposed policy, program, plan, or project. The SEIA process should inform communities and individuals about the proposed project and its potential socio-economic consequences, while also allowing them to assess the implications and identify potential alternatives. The assessment process should also alert proponents and planners to the likelihood and nature of socio-economic impacts, allowing them to anticipate and predict these impacts ahead of time, so that the assessment's findings and recommendations are incorporated into and inform the planning and decision-making process.

However, the issue of social impacts is complicated by the way in which different people from different cultural, ethic, religious, gender, and educational backgrounds, etc. view the world. This is referred to as the “social construct of reality”. The social construct of reality informs people’s worldview and the way in which they react to changes.

3.2 Approach to Study

The approach to the Environmental Impact Assessment Level SEIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007).[2]. The key activities in the SEIA process embodied in the guidelines include:

- Describing and obtaining an understanding of the proposed intervention (type, scale, and location), the settlements, and communities likely to be affected by the proposed project.
- Collecting baseline data on the current social and economic environment.
- Identifying the key potential socio-economic issues associated with the proposed project. This requires a site visit to the area and consultation with affected individuals and communities.
- Assessing and documenting the significance of socio-economic impacts associated with the proposed intervention.
- Identifying alternatives and mitigation measures.

3.2.1 Collection and Review of Existing Information

Existing desktop information that has relevance to the proposed project, project area and/or surroundings was collected and reviewed. The following information was examined as part of this process:

- Project maps and layouts.
- Google Earth imagery.
- A description of the project (as provided by the project proponent).
- Responses to questions posed to the project proponent regarding employment and socio-economic upliftment and local economic development opportunities (as provided by the project proponent).
- Census Data (2016), and the Local Government Handbook (2019).
- Planning documentation such as Provincial Growth and Development Strategies (PGDSs), Local and District Municipality Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and development goals and objectives.
- Relevant legislation, guidelines, policies, plans, and frameworks.

[2]These guidelines are based on international best practice and are applicabe to all provinces within South Africa

The identification of potential social issues associated with the proposed development is based on primary and secondary information about the area and visits to the relevant communities and town by field workers/members of the SEIA study team.

3.2.2 Timing of Socio-Economic Impacts

Socio-economic impacts vary in both time and space. In terms of timing, all projects and policies go through a series of phases, usually starting with initial planning, followed by implementation (construction), operation, and finally closure (decommissioning). The activities, and hence the type and duration of the socio-economic impacts associated with each of these phases are likely to differ.

3.3 Reporting

3.3.1 Baseline Report

Based on the information collected through the desktop review, engagement with and information from other specialist studies, a socio-economic baseline profile was compiled for the respective study areas defined in Section 5. Topics considered as part of this profile include (but are not limited to) the following:

- Population;
- Education;
- Economy;
- Employment;
- Income and Poverty; and
- Human Development.

3.3.2 Impact Assessment

The assessment of the socio-economic impacts identified for the proposed Project is based on an impact rating process designed to provide a numerical rating of the significance of each impact. The significance rating process follows the established impact/risk assessment formula where significance is a function of the consequence of an event multiplied by the probability of its occurrence.

The following steps were undertaken as part of the impact assessment:

- Impact identification and assessment: Based on the anticipated interaction between specific and/or collective project activities and baseline socio-economic conditions, several potential impacts were identified for each phase of the Project; and
- Impact mitigation: realistic measures were developed aimed at mitigating, and if possible, avoiding the negative socio-economic impacts, and enhancing the benefits of positive socio-economic impacts.

4 Legislation and Policy Review

This section introduces the relevant policies on various levels of government and their content.

The legislative and policy context applicable to a project plays an important role in identifying and assessing the potential socio-economic impacts associated with the development. In this regard a key component of the SEIA process is to assess a proposed development in terms of its suitability with regards to key planning and policy documents.

The following key pieces of documentation were reviewed as part of this legislation and policy review process:

4.1 National Legislation and Guidelines

The following documentation provides national policy guidelines:

- Constitution of the Republic of South Africa, 1996;
- National Environmental Management Act (No. 107 of 1998) (NEMA);
- National Environmental Management: Biodiversity Act (Act No.10 of 2004)
- National Environmental Management: National Biodiversity Offsets Guidelines (2017);
- National Water Act (Act No. 36 of 1998)
- Water Services Act (Act No.107 of 1997);
- The National Water Resource Strategy (Third Edition) (2023);
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004);
- National Development Plan (NDP) 2030 (2012);
- The Construction Industry Development Act (Act No. 38 of 2000);
- The Municipal Infrastructure Guidelines and Regulations (2010); and
- Spatial Planning and Land Use Management Act (Act No. 16 of 2013)

4.1.1 Constitution of the Republic of South Africa, 1996

Section 24 of the Constitution pertains specifically to the environment. It states that everyone has the right to an environment that is not harmful to their health or well-being, and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is

especially significant for previously disadvantaged individuals who are most at risk to environmental impacts.

4.1.2 National Environmental Management Act (No. 107 of 1998) (NEMA)

This piece of legislation is South Africa's key piece of environmental legislation and sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights.

The national environmental management principles state that the social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment. The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.

4.1.3 National Water Act (Act No. 36 of 1998)

The Act holds significant importance for the proposed KTE Brandvlei Water Pipeline and Associated Infrastructure Project, aiming to secure a sustainable and equitable water supply for the community. This legislation ensures that the project follows guidelines to protect the environment, safeguard water resources, and manage them responsibly. Section 19 addresses water use and licensing, crucial for assessing socio-economic impacts associated with water resources affected by the water pipeline construction. The project can contribute positively by implementing water conservation measures, minimising disruptions to local water supplies, and promoting equitable access to water resources for nearby communities. Through responsible water management practices and community engagement efforts, the pipeline project can support sustainable socio-economic development by safeguarding water security, enhancing agricultural productivity, and improving livelihoods dependent on reliable water sources.

For the community members, this means that the water supply is not only reliable but also considers the long-term health of the ecosystems. The act emphasises community engagement, ensuring their needs are heard and addressed. Moreover, it promotes fair employment practices, local job creation, and skills development, enhancing socio-economic opportunities within the community.

4.1.4 Water Services Act (Act No. 107 of 1997)

The Water Services Act holds crucial relevance for the proposed KTE Brandvlei Water Pipeline Project, prioritising the delivery of clean and accessible water to the community. Specifically, Section 4 of the Act emphasises the importance of community participation in decisions affecting water services. This means that the community's opinions matter and the project aims to reflect community needs and preferences. Additionally, Section 19 encourages job creation and skills development within the community, ensuring that employment opportunities and training programs are considered in the project's implementation. By aligning with the

Water Services Act, the proposed KTE Brandvlei Water Pipeline Project can not only focuses on providing a reliable water supply but also strives to enhance community involvement, support local employment, and contribute to the overall socio-economic well-being of the residents.

4.1.5 The National Water Resource Strategy (Third Edition, 2023)

The third edition of the National Water Resource Strategy (NWRS-3) is central to South Africa's water resource management, aiming to ensure equitable access to water and sanitation services for socio-economic growth. It sets objectives for comprehensive water resource management, covering protection, use, development, conservation, and control across defined areas. NWRS-3 strengthens water sector regulation, identifying opportunities and constraints while promoting innovation. It aligns with key legislative acts like the National Water Act and Water Services Act, emphasising wise water use and community access. Together, these laws foster sustainable water management, balancing societal needs with environmental preservation for a secure water future in South Africa.

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

The National Environmental Management: Biodiversity Act (NEM:BA) in South Africa plays a crucial role in the context of water pipeline projects, particularly under the guidance of Sections 52 and 56. These sections underscore the Act's commitment to protecting biodiversity, ensuring that projects like the water pipeline infrastructure not only acknowledge but actively safeguard the natural environment, encompassing both flora and fauna. This legislative framework provides community members with the assurance that the project prioritises the preservation of local ecosystems, implementing measures to minimise any adverse impacts.

The NEM:BA sets forth clear objectives aimed at maintaining and enhancing the country's biological diversity within the overarching structure of the National Environmental Management Act. These objectives include the management and conservation of biological diversity across the Republic, the sustainable use of indigenous biological resources, and the fair and equitable distribution of benefits derived from bioprospecting involving indigenous biological resources. Moreover, the Act seeks to enforce international agreements related to biodiversity that South Africa has ratified, emphasising the nation's commitment to global environmental stewardship.

Additionally, the NEM:BA aims to foster cooperative governance in the management and conservation of biodiversity. It also establishes the South African National Biodiversity Institute (SANBI) to bolster the realisation of the Act's objectives. SANBI, an essential entity renowned for its expertise in research and conservation, plays a vital role in supporting the implementation of the Act. Through these measures, the NEM:BA underpins the proposed KTE Brandvlei Water Pipeline Project's approach to environmental conservation, highlighting the importance of biodiversity in enhancing community well-being and quality of life. By integrating these principles, the project can not only contribute to the health of the surrounding

environment but can also ensure that the community benefits from a protected and vibrant natural habitat.

4.1.7 NEM:BA National Biodiversity Offsets Guidelines (2017)

These guidelines, outlined in Section 9 of the National Environmental Management Act (NEMA), aim to mitigate the project's potential adverse effects on biodiversity. By adhering to these guidelines, the project ensures that any environmental disturbances caused by the pipeline's construction are compensated for through biodiversity offsets. This can involve actions such as restoring or enhancing degraded ecosystems, which not only benefit biodiversity but also create job opportunities and support local economic development. By integrating biodiversity offsets into the project planning, the project can not only mitigate environmental impacts but also contribute positively to the socio-economic fabric of the community, aligning with the commitment to responsible and sustainable development.

4.1.8 National Development Plan 2030 (2012)

The National Development Plan (NDP) 2030, prepared by the National Planning Commission, envisions a dynamic energy sector that drives economic growth, promotes social equity, and ensures environmental sustainability. For the proposed KTE Brandvlei Water Pipeline Project, the NDP's focus on providing to provide bulk potable water to municipalities in its designated operation area. This project plays a crucial role in transporting water from the Orange River to Brandvlei, supporting the NDP's goal of eliminating poverty and reducing inequality by 2030. The project aligns with the NDP's vision of facilitating a more labour-absorbing economy, with a supportive environment for growth and development.

The NDP holds significant relevance for the proposed KTE Brandvlei Water Pipeline and Associated Infrastructure Project, aligning with the goal of improving the community's well-being. Section 6 of the plan emphasises inclusive economic growth, which directly impacts the community. By adhering to the NDP, the project can focus on sustainable development, ensuring that the community benefits from a reliable water supply and experiences positive socio-economic impacts. This commitment reflects a shared vision for a prosperous and inclusive community, where the benefits of the water pipeline extend beyond mere infrastructure, reaching each member of the community.

4.1.9 The Construction Industry Development Board Act (No.38 of 2000)

The Construction Industry Development Board Act in South Africa holds direct relevance to the proposed KTE Brandvlei Water Pipeline and Associated Infrastructure Project, particularly in Chapter 2, which centres on socio-economic development. This means that the project is not just about building water pipelines; it's about creating positive impacts in the community. The act ensures that the construction process does not just meet legal requirements but goes a step further to benefit the community. It promotes job creation, skills development, and opportunities for local businesses, giving the community members a chance to be part of the project's success.

4.1.10 Municipal Infrastructure Guidelines and Regulations (2010)

The Municipal Infrastructure Guidelines and Regulations are essential for the water pipeline infrastructure project, especially in Section 5, which prioritises the socio-economic well-being of the community. This means that the project is more than just laying water pipelines; it's about positively impacting the community's daily lives. The guidelines ensure that the construction process considers community needs and concerns, emphasising community engagement. Moreover, in Section 8, the guidelines encourage the inclusion of local businesses in the project, supporting economic growth in the community. By following these guidelines, the water pipeline infrastructure project can aim to deliver a reliable water supply but also to enhance job opportunities, skills development, and overall economic empowerment for the community.

4.1.11 Spatial Planning and Land Use Management Act (Act No. 16 of 2013)

Section 9 of SPLUMA emphasises the importance of promoting social and economic development through land use planning, which directly pertains to the project's focus on providing essential water services and supporting local economic growth. By adhering to SPLUMA, the proposed KTE Brandvlei Water Pipeline Project can aim to optimise land use in a way that enhances infrastructure development, creates job opportunities, and fosters sustainable community development.

4.2 Provincial Policy

Relevant policy and planning documents on the provincial level include:

- Northern Cape Provincial Growth and Development Strategy (2012-2030)
- Northern Cape Provincial Spatial Development Framework (2021)

4.2.1 Northern Cape Provincial Growth and Development Strategy (2012-2030)

The Northern Cape Provincial Growth and Development Strategy (NCPGDS) identifies poverty reduction as the foremost challenge, recognising its pervasive impact on various societal issues. The strategy emphasises sustainable economic growth and development as the primary solution. This aligns with the pipeline project, as it prioritises economic development, creating job opportunities during construction and operation, thus contributing to poverty alleviation.

Furthermore, the NCPGDS emphasises the importance of lifelong learning and skill enhancement to drive economic development. The water pipeline project indirectly supports these objectives by potentially necessitating skill development and training for local workers employed in project-related activities.

Moreover, the NCPGDS underscores the significance of developing human and social capital, improving governance effectiveness, and enhancing infrastructure for economic growth. The

project aligns with these objectives by promoting skill development, adhering to environmental regulations, and enhancing wastewater management infrastructure.

Overall, the NCPGDS serves as a strategic blueprint for sustainable development in the Northern Cape, guiding projects like the water pipeline towards aligning with regional development priorities. By addressing poverty, promoting economic growth, and enhancing infrastructure, the water pipeline project can contribute to the overarching goals of the NCPGDS, making it relevant and beneficial for the region's growth and development aspirations.

4.2.2 Northern Cape Provincial Spatial Development Framework (PSDF) (2021)

The Northern Cape Provincial Spatial Development Framework (NCPSDF, 2021) guides spatial development and land use with a focus on sustainable growth and environmental sustainability in the province. The proposed KTE Brandvlei Water Pipeline Project aligns with this framework by enhancing water supply infrastructure to support socio-economic development in Brandvlei and its surroundings without compromising the environment.

By following the NCPSDF's emphasis on collaborative planning, the project engages local communities and stakeholders, ensuring that its development benefits align with the province's long-term goals and receives broad support. This approach will not only meet infrastructural needs but also fosters community involvement and sustainability.

4.3 District & Local Municipalities Policies

The strategic policies at a district and local level have similar objectives for the respective areas, namely, to accelerate economic growth, create jobs, and uplift communities. The proposed project is considered to align with the aims of these policies, even if contributions to achieving the goals therein are only minor.

A brief review of the most relevant district and local municipal policies is provided below:

- The ZF Mgcawu District Municipality Final Integrated Development Plan (IDP) (2017-2022)
- Kai !Garib Local Municipality Final Integrated Development Plan (2022/2023)
- The Namakwa District Municipality Final Integrated Development Plan (IDP) 2017-2022
- Hantam Local Municipality Final Integrated Development Plan 2022/2023

4.3.1 ZF Mgcawu District Municipality (ZFMDM) Final Integrated Development Plan (IDP) (2017-2022)

The ZF Mgcawu District Municipality's mission is to be the centre of excellence in providing quality basic services through support to local municipalities. This can align with the proposed KTE Brandvlei Water Pipeline Project in several ways:

- **Financial Viability (Mayoral Committee): (KPA 1):** The water pipeline project can enhance financial viability by attracting investment and economic growth to the district through improved water infrastructure. It can align with financial viability by ensuring that resources are efficiently managed and allocated to support sustainable development initiatives.
- **Institutional Development: (KPA 2):** The project can contribute to institutional development by strengthening the capacity and expertise of local institutions in managing water resources and infrastructure.
- **Service Delivery (KPA 3):** The water pipeline project can improve service delivery by ensuring a reliable and sustainable water supply to meet the needs of communities within the district.
- **Local Economic Development (KPA 4):** The project can stimulate local economic development by creating job opportunities during construction and supporting economic activities related to water supply.
- **Good Governance and Public Participation (KPA 5):** The water pipeline project can promote good governance by ensuring transparency, accountability, and community engagement throughout its planning and implementation phases. It can align with good governance by adhering to regulatory requirements, respecting community input, and promoting inclusive decision-making processes.

By enhancing financial stability and capacity building, improving service provision, stimulating economic activities, and promoting transparent governance, the project can serve as a catalyst for socio-economic progress within the district, reinforcing the ZF Mgcawu municipality's mission as a centre of excellence in service delivery and governance.

4.3.1.1 Kai !Garib (KGLM) Draft Integrated Development Plan (IDP) (2022/2023)

The proposed KTE Brandvlei Water Pipeline Project within the Kai !Garib Local Municipality, under the ZF Mgcawu jurisdiction, can align comprehensively with the municipality's key performance areas (KPA) to facilitate the achievement of district objectives. Embracing the local municipality's vision of creating an economically viable and fully developed community, the project can endeavour to enhance the standard of living for all residents through good governance, excellent service delivery, and sustainable development.

- **An accountable local authority with a fit for purpose workforce and transparent financial management practices (KPA 1):** The project can promote transparency and efficiency in resource management, contributing to the municipality's overall development objectives.
- **Human Development Initiatives (KPA 2):** The project can ensure access to clean water, bolstering social well-being and health initiatives for residents.
- **Limiting the impact of our presence in the natural environment to return to a heritage of preservation (KPA 3):** The project will implement measures to limit

environmental impact, aligning with the municipality's commitment to heritage preservation.

- **Maintenance and Development of Infrastructure and Services (KPA 4):** The project can improve water infrastructure, vital for community well-being and economic growth.
- **To Stimulate Economic Growth for the Benefit of all Communities (KPA 5):** The project can generate job opportunities and support economic activities, benefitting all communities..
- **Municipal Transformation and Institutional Development (KPA 6):** The project can contribute by enhancing institutional capacity and infrastructure, fostering efficient water resource management while minimising environmental impact to preserve natural heritage.

In essence, the proposed KTE Brandvlei Water Pipeline Project can play a pivotal role in advancing the Kai !Garib Local Municipality's goals, encompassing improved infrastructure, social well-being, environmental conservation, economic growth, and accountable governance within the ZF Mgcawu District.

4.3.2 Namakwa District Municipality (NDM) Final Integrated Development Plan (IDP) (2022-2027)

The proposed KTE Brandvlei Water Pipeline Project can contribute to and align with the key performance areas (KPAs) of the Namakwa District Municipality. Here are the relevant key performance areas and how the project can contribute to each:

- **Municipal Transformation and Institutional Development (KPA 1):** The proposed KTE Brandvlei Water Pipeline Project can support municipal transformation by enhancing the water infrastructure of the Namakwa District.
- **Service Delivery (KPA 2**): This project can significantly improve service delivery by providing a reliable and clean water supply to residents and businesses in the district.
- **Local Economic Development (KPA 3)**: The pipeline project can stimulate local economic development by creating direct and indirect employment opportunities during and after its construction. It can support the agricultural sector—a key economic driver in the region—by providing the necessary water resources for irrigation, thereby promoting the growth and diversification of the local economy.
- **Municipal Financial Viability and Management (KPA 4)**: The proposed pipeline project can enhance municipal financial viability and management by generating revenue through water reuse and treatment services.
- **Good Governance and Public Participation (KPA 5)**: The project can uphold principles of good governance by maintaining transparency in its planning and implementation processes. It can engage local communities and stakeholders in

decision-making, ensuring that the project's benefits are understood and supported by the public, and that feedback is incorporated into ongoing operations.

Overall, by aligning with the strategic objectives outlined in the Namakwa District's IDP, the proposed KTE Brandvlei Water Pipeline Project can play a vital role in promoting sustainable development and enhancing the socio-economic prospects of the region. It not only addresses the immediate water needs of the community but also contributes to long-term goals of environmental sustainability and economic resilience.

4.3.2.1 Hantam Local Municipality (HLM) Integrated Development Plan (IDP) 2023/2024

The IDP of the Hantam Local Municipality (HLM) serves as a strategic roadmap for local development initiatives and infrastructure projects. In this context, proposed KTE Brandvlei Water Pipeline Project is intricately linked to the objectives outlined in this IDP, aligning closely with each strategic objective of the municipality. The proposed project can play a pivotal role in advancing the Strategic Objectives (SO's) of the HLM.

- **Infrastructure Development and Basic Service Delivery (SO 1):** The project can ensure the provision of essential water services, addressing a critical aspect of basic service delivery within the municipality.
- **Institutional Development and Municipal Transformation (SO 2):** The project can enhance institutional capacity and infrastructure for effective water management, fostering modernisation and efficiency in service delivery.
- **Economic Development (SO 3):** The project can stimulate local economic growth by creating job opportunities during construction and support economic activities related to water supply, thereby contributing to the municipality's economic development goals.
- **Municipal Financial Sustainability and Viability (SO 4):** The project will adhere to transparent financial practices, ensuring efficient resource allocation and contributing to the municipality's long-term financial sustainability.
- **Good Governance and Public Participation (SO 5):** The project can promote transparency, accountability, and community engagement throughout its planning and implementation phases, aligning with the municipality's objectives of fostering good governance and inclusive decision-making processes.

Overall, the proposed KTE Brandvlei Water Pipeline Project can align comprehensively with the strategic objectives of the Hantam Local Municipality, contributing to infrastructure development, economic growth, financial sustainability, and good governance within the region.

4.4 Policy Result

The proposed KTE Brandvlei Water Pipeline Project can not only aligns with South African national policies, but also provincial, district and local planning and policy frameworks. These

standards provide guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

5 Socio-Economic Profile

5.1 Study Area Overview

This section outlines the relevant administrative context, the provincial socio-economic, and municipal contexts. It concludes with a description of the local context of the immediate surroundings of the proposed KTE Brandvlei Water Pipeline Project.

Table 2: Study Area Context for the Proposed KTE Brandvlei Water Pipeline Project

Province	Northern Cape
District Municipality	Namakwa District Municipality (NDM) ZF Mgcawu District Municipality (ZFMDM)
Local Municipality	Hantam Local Municipality (HLM) Kai !Garib Local Municipality (KGLM)
Ward number(s)	HLM: 3 KGLM: 5 and 9
Nearest town(s)	Brandvlei
Current Zoning	Mixed
Current land use	The land in question comprises of many different farmlands and properties.
Access	Access to the project area is provided via the R27.

This Chapter provides an overview of the socio-economic environment of the province, District Municipalities (DMs), and Local Municipalities (LMs) within which the KTE Brandvlei Water Pipeline Project is proposed and provides the socio-economic basis against which potential issues can be identified.

5.2 Site Specific Sensitivities

The Northern Cape, characterised by its vast arid and semi-arid zones, faces unique challenges that the proposed KTE Brandvlei Water Pipeline Project aims to address. The region has historically grappled with water scarcity issues, primarily due to its climate and limited rainfall, which impacts both the residents and the predominant agricultural activities. This scarcity affects not only daily living conditions but also the economic stability of the area, which relies heavily on agriculture and mining.

The local economy of the Namakwa District is also influenced by seasonal tourism, which depends significantly on the availability of basic amenities such as water. Due to the growing demands of the population and industries, which have seen periodic growth spurts due to

mining activities and agricultural development, the water infrastructure has to meet these growing demands.

The proposed KTE Brandvlei Water Pipeline Project is designed to improve the reliability and quality of water supply. By providing a consistent and clean water source, the project is expected to bolster agricultural productivity and support the local industries that are vital to the region's economy. Additionally, improving water infrastructure can enhance the quality of life for residents and make the area more attractive for tourists, providing a boost to local businesses.

Table 3 presents a preliminary assessment of key socio-economic attributes identified in the study area which can be seen on Figure 11, their potential impacts, and proposed next steps for each attribute. The attributes have been identified based on a review of existing information, site visits, and initial stakeholder consultations. The table is intended to provide a structured framework for the ongoing SEIA process and will be further refined as the assessment progresses.

Table 3: Site Specific Sensitive Attributes Identified for the Proposed KTE Brandvlei Water Pipeline Project

Sensitive Attribute Identified	Description	Impact Associated	Risk/Opportunity	Next Steps
Rivers and Streams	The Orange River is located ~120km north of the proposed KTE Brandvlei Water Pipeline. The proposed development will cross the GrootVloer Pan – a large alluvial floodplain, and will cross a number of other drainage lines and watercourses. The proposed development will cross tributaries of the Sak Rivier.	Development which impacts rivers or stream are not advised, the area houses subsistence farmers which make use of these hydrological features and therefore may carry a negative socio-economic rating if impacted.	Risk	Implement the recommendations from the freshwater study conducted.
Main Access Roads	The main access roads are the: R27 – The proposed development runs adjacent to the road. Alternative access roads: Soafskolk Road – At the North end and start of the proposed pipeline.	These will provide access for the components of the proposed development to be transported along, as well as for the workers to gain access, it is therefore important that public transport exists along these routes, which was confirmed during the site visit.	Opportunity	Implement the recommended traffic management plan to manage the increased traffic during construction and operation, ensuring minimal disruption to local communities.
Agricultural Development	Multiple farms are located within a 5km radius of the proposed development. Farms found within the study area of include: • Farm 322 Kenhardt • Farm 323 Kenhardt • Farm 333 Kenhardt • Farm 334 Kenhardt • Farm 335 Kenhardt • Farm 336 Kenhardt • Farm 20 Kranskop • Farm 21 Gous Vley	The development is primarily in mixed agricultural region. The development may pose a security risk and increase the rate for small petty crimes in the surrounding communities, this includes theft of items, livestock, produce, etc.	Risk	Implement the mitigation measures associated to the extent of the impact as recommended in Chapter 8.
Mixed Residential	The proposed development has mixed residential housing within a 3kms radius.	These areas house mainly unemployed unskilled or semi-skilled labour which may be able to be provided with employment and skills development training during the construction and operational phases.	Opportunity	Implement the mitigation measures associated to the extent of the impact as recommended in Chapter 8.
Mixed Industrial	Small scale economic activities which take place within the local area.	Activities which could provide goods and services on a local scale to the developers during the construction and operational phases of development which will stimulate the local economy.	Opportunity	The extent of the impact and associated mitigation measures will be assessed within this SEIA.

Commented [SM1]: Client to provide list of affected properties.

Sensitive Attribute Identified	Description	Impact Associated	Risk/Opportunity	Next Steps
Mixed Consumer	Small scale economic activities which take place within the local community surrounding the proposed pipeline such as small shops, restaurants, accommodation establishments, etc.	Activities which could provide goods and services on a local scale to the developers during the construction and operational phases of development which will stimulate the local economy.	Opportunity	The extent of the impact and associated mitigation measures will be assessed within this SEIA.
School	Kindergarten, primary schools and secondary schools located in close proximity to the development area and in surrounding area of 3km radius. These include: ● Brandvlei Primêre Skool - ~2km south-east of the proposed development area; and ● Brandvlei High School - ~1km south-east of the proposed development area.	Well-maintained schools in surrounding area of 3km radius have no direct impacts from the development.	Opportunity	Implement the mitigation measures associated to the extent of the impact as recommended in Chapter 8.
Towns and Settlements	Towns and settlements found within the study area of include: ● Brandvlei – within the development site ● Onderste Doorns - ~3.5km east of the proposed development. ● Nieuwepos - ~13km west of the proposed development. ● Vendors Puts - ~17km west of the proposed development.	Alternative employment opportunities will be provided to the local community members, although the employment opportunities are anticipated to be limited.	Opportunity	Implement the mitigation measures associated to the extent of the impact as recommended in Chapter 8.
Aerodrome	Halfweg Aerodrome is located ~46km west of the proposed development.	No direct impacts anticipated.	Not applicable	No specific action needed.

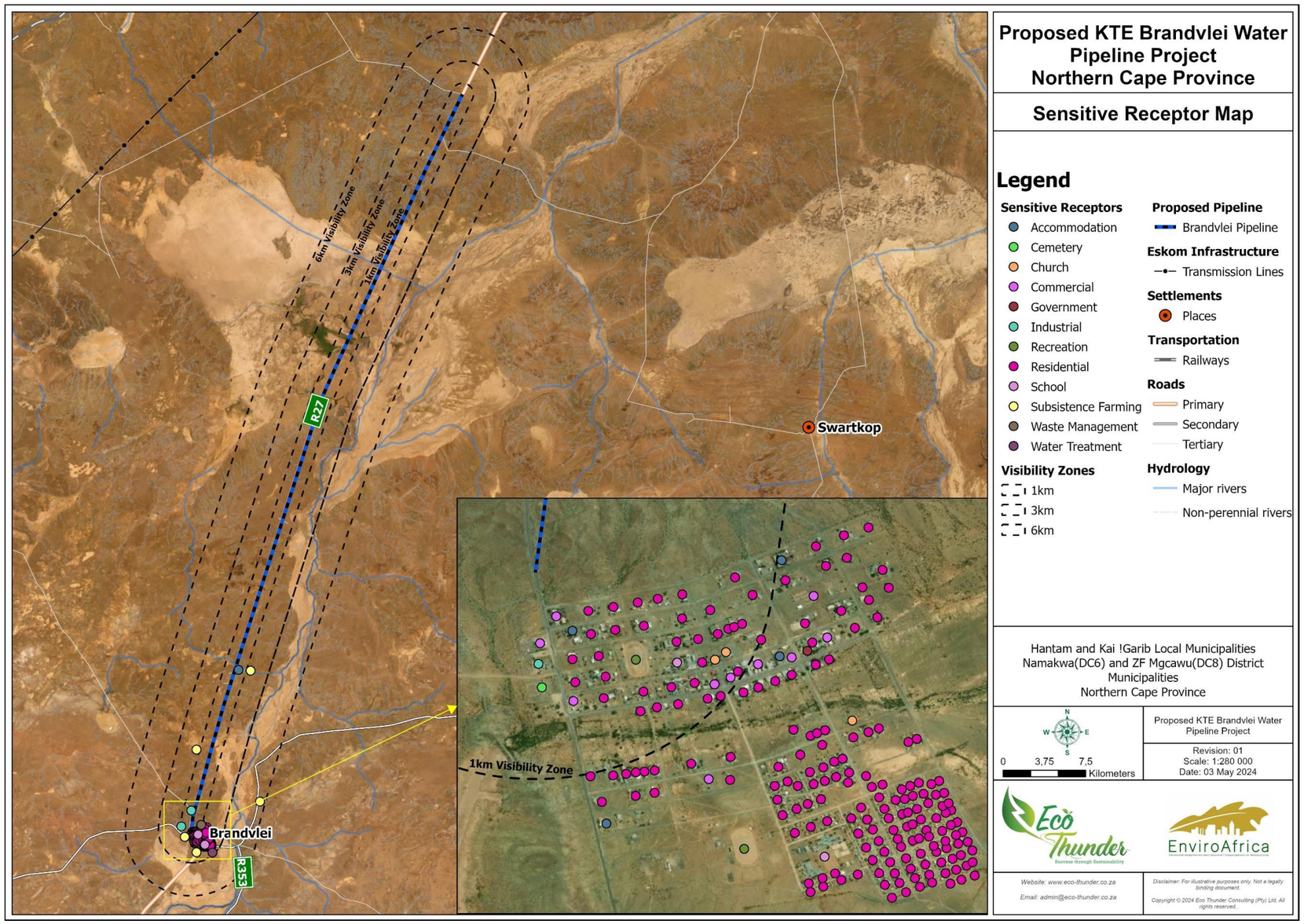


Figure 11: Overview of Sensitivities: Region 1

Photograph 1: Main Access Road: R27

Photograph 2: Accommodation noted along the Development Site

Photograph 3: Brandvlei Reservoir along the Development Site

Photograph 4: Landscape View of the Development Site

Figure 12: Site Photos

5.3 Northern Cape Province Overview

The Northern Cape is South Africa's largest province covering an area of 372 889 squared kms, however it is the province with the smallest population. It is located in the western parts of the country and is bordered by Namibia and Botswana, as well as the North West, Free State, Eastern Cape, and Western Cape province. The Orange River runs through the province, providing a vital water source and contributing to its agricultural potential.

It is known for its diverse landscapes including the arid Karoo, the Richtersveld mountains, and the Kalahari Desert. It is economically driven by mining (diamonds, iron ore, manganese, and zinc), agriculture, and tourism. Kimberley is the capital city, famous for its diamond mining history. The province has 5 district municipalities and 26 local municipalities.

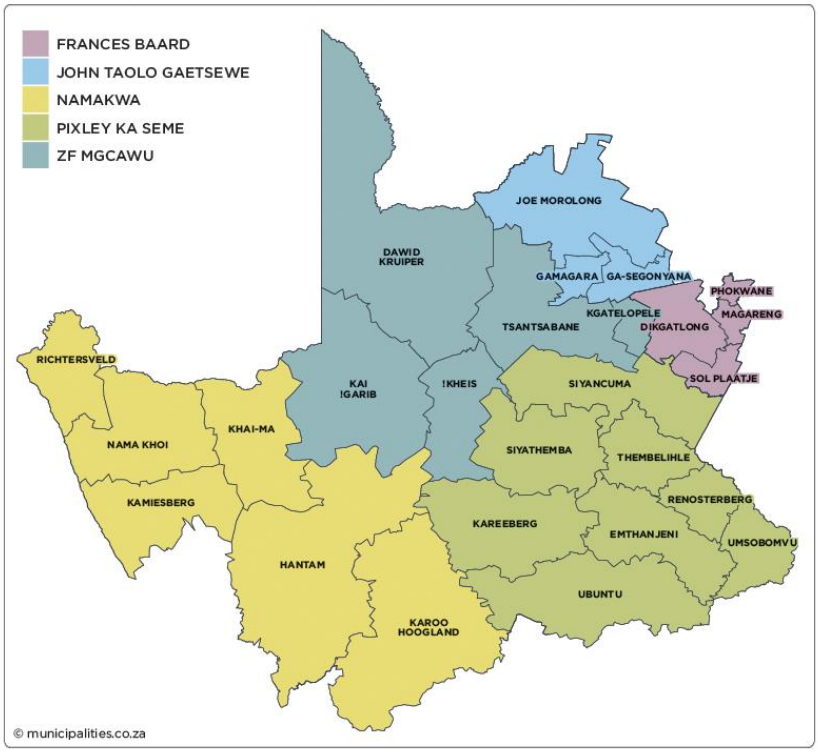


Figure 13: Map showing the districts of the Northern Cape Province

(Source: www.municipalities.co.za)

5.3.1 Population

The Norther Cape has the smallest population in South Africa, with the population of 1 303 047 in 2021, which has been increasing through the years, similarly to 7 other provinces. The population growth rate has been on a decline through the years, this meaning that population is growing but at a slower rate, especially comparative to the growth rate seen in 2010.

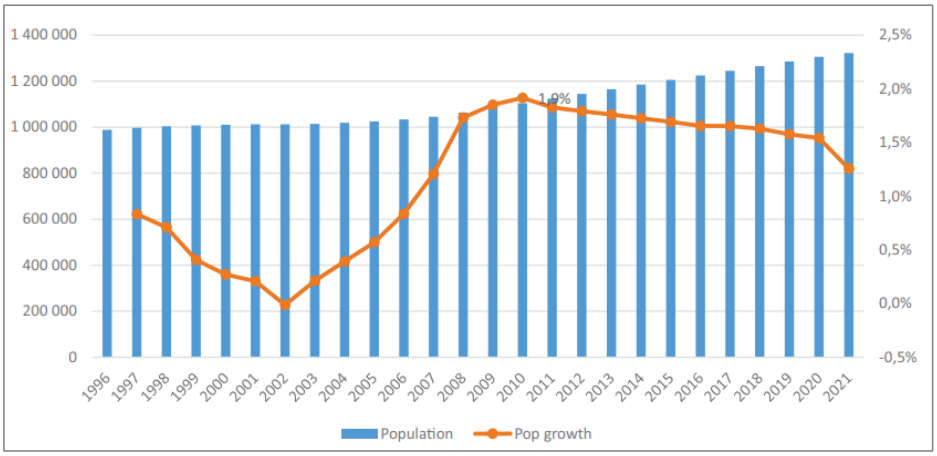


Figure 14: Northern Cape Total Population Growth Rate.

Northern Cape population in terms of age structure tend to follow similar pattern as that of the country, dominated by people of young age or youth, with majority of the population younger than 15. In the age group of 0-14 and 25-34 are dominated by males. From the age group of 75+ the Northern Cape population is dominated by females; this could be the contributing factor to the decreased population growth rate.

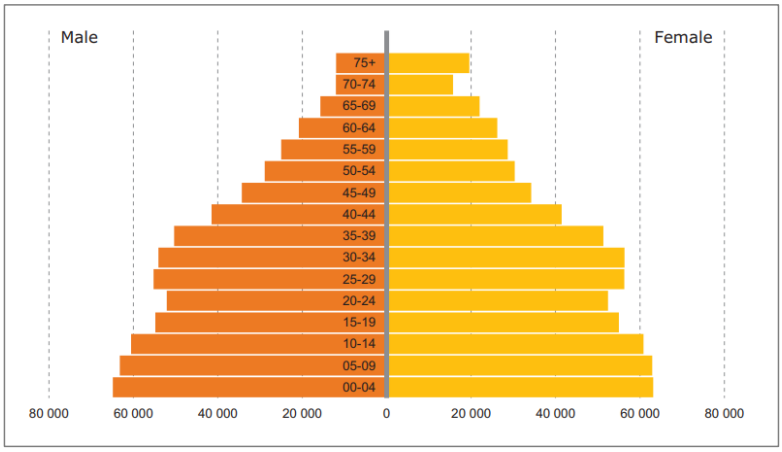


Figure 15: Population Pyramid of the Northern Cape Province

In terms of the district distribution of the Northern Cape population, majority of the province population resides Frances Baard District Municipality, contributing 32.3% to the provincial municipality. It is followed by ZF Mgcawu, John Taolo Gaetsewe and Pixley Ka Seme District Municipalities, contributing 21.4%, 19.1% and 16.6% to the provincial population respectively. The lowest population in the province is found in Namakwa District Municipality which contributes 10.6% to the population.

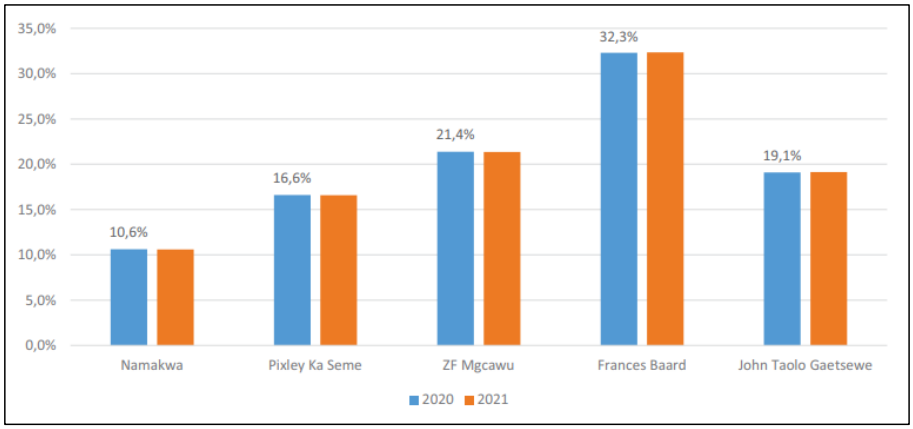
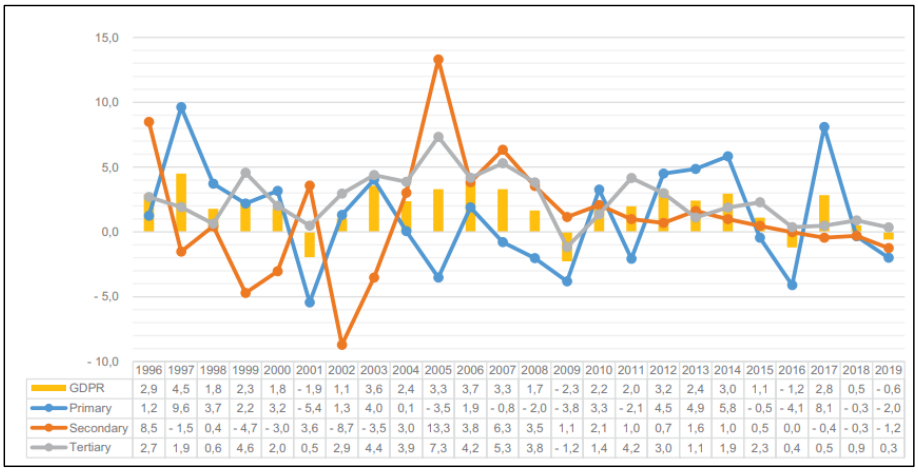


Figure 16: Northern Cape District Population Distribution

5.3.2 Economy

The Northern Cape's economy shrank by 0.6% in 2019, which was worse than the national economic growth of 0.2% in the same period. This decline was driven by seven sectors experiencing negative growth. Agriculture saw the biggest decline at -6.5%, followed by construction at -2.5%, and trade at -1.4%. Despite being the largest contributor to the provincial economy, mining also saw a decrease of -0.9%. Only finance, government services, and personal services prevented a more significant economic decline in the province.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GDPR	2,9	4,5	1,8	2,3	1,8	- 1,9	1,1	3,6	2,4	3,3	3,7	3,3	1,7	- 2,3	2,2	2,0	3,2	2,4	3,0	1,1	- 1,2	2,8	0,5	- 0,6
Primary	1,2	9,6	3,7	2,2	3,2	- 5,4	1,3	4,0	0,1	- 3,5	1,9	- 0,8	- 2,0	- 3,8	3,3	- 2,1	4,5	4,9	5,8	- 0,5	- 4,1	8,1	- 0,3	- 2,0
Secondary	8,5	- 1,5	0,4	- 4,7	- 3,0	3,6	- 8,7	- 3,5	3,0	13,3	3,8	6,3	3,5	1,1	2,1	1,0	0,7	1,6	1,0	0,5	0,0	- 0,4	- 0,3	- 1,2
Tertiary	2,7	1,9	0,6	4,6	2,0	0,5	2,9	4,4	3,9	7,3	4,2	5,3	3,8	- 1,2	1,4	4,2	3,0	1,1	1,9	2,3	0,4	0,5	0,9	0,3

Figure 17: Northern Cape GDPR and Sectoral Growth Rates

Figure 17 shows how different industries contributed to the province's economy from 1996 to 2019. The tertiary industries, like services, were the biggest contributors, followed by primary industries, like agriculture. The province's economy was estimated at R 103 billion in 2019, which is a slight improvement from 2018. The GDP figures for 2019 show a gradual growth improvement, with a nominal GDP of R 103 billion, compared to R 100 million in 2018. However, in constant GDP figures, the economy declined by 0.6%, from R 68.9 billion in 2018 to R 68.4 billion in 2019.

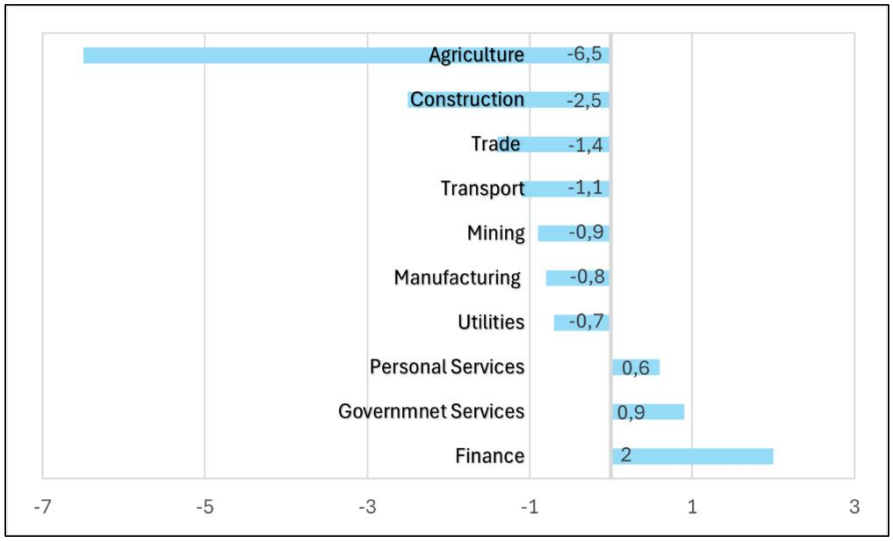


Figure 18: Northern Cape Sectoral Growth, 2019

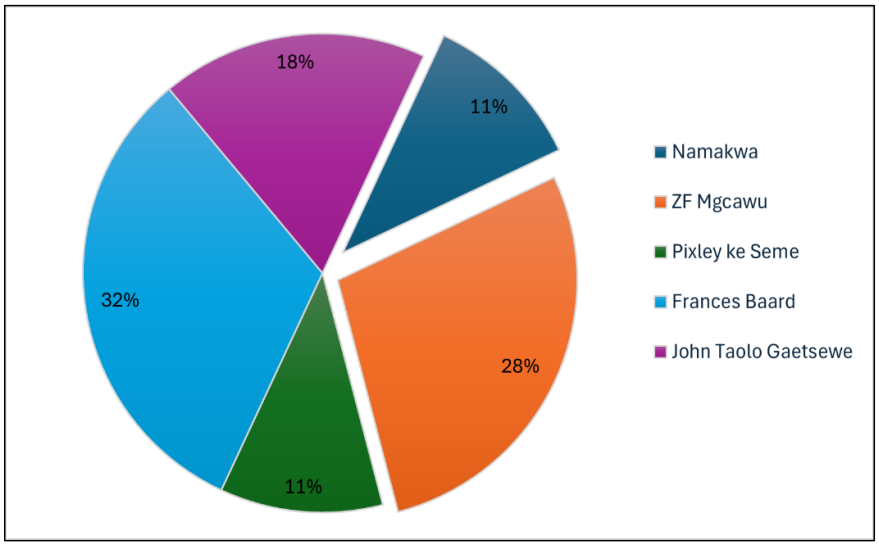


Figure 19: District Contribution to Northern Cape GDP, 2020

In 2020, the Frances Baard district remained the largest contributor to the provincial economy, accounting for an estimated 32.0%. Following closely behind is the ZF Mgcawu district, contributing around 28.0%. Despite being key districts in the industrialisation drive through the Northern Cape Industrial Corridor, John Taolo Gaetsewe (18%) and Namakwa (11%) are among the least contributors to the provincial economy, as shown in Figure 19.

Table 4: Northern Cape Labour Market Characteristics

Northern Cape	Jul-Sep 2020	Oct-Dec 2020	Jan-Mar 2021	Apr-Jun 2021	Jul- Sep 2021	q-on-q	
						% Change	Difference
Population 15-64 years	812	816	815	817	819	0.2%	1 917
Labour Force	373	431	409	357	366	2.7%	9 641
Employed	287	308	313	256	275	7.3%	18 836
Unemployed	86	126	96	100	91	-9.2%	-9 195
Not economically active	439	384	406	461	453	-1.7%	-7 724
Discouraged work-seekers	91	74	98	125	137	9.3%	11 609
Other	348	311	309	335	316	-5.8%	-19 333
Rates (%)							
Unemployment rate	23.1	28.7	23.4	28.1	24.9	-11.4%	-3.2
Employed / population ratio (Absorption)	35.3	37.7	38.4	31.4	33.6	7.0%	2.2
Labour force participation rate	45.9	52.9	50.2	43.6	44.7	2.5%	1.1

The working-age population (15-64 years) in the Northern Cape increased marginally, reaching 819,000. The labour force peaked at 431,000 in late 2020 before settling at 366,000 by mid-2021. Employment figures followed a similar trend, initially rising, then dropping mid-year, and modestly recovering to 275,000 by the end of the period. Unemployment peaked at 124,000 in late 2020 but showed signs of improvement, decreasing to 91,000 by mid-2021. However, the number of individuals not economically active slightly increased, with a notable rise in discouraged work-seekers from 91,000 to 137,000, highlighting an increasing portion of the population ceasing to look for work due to various discouragements.

The unemployment rate improved from 23.1% to 24.9%, despite peaking at 28.7%. The employment/population ratio decreased, signalling a lower proportion of the working-age population being employed. The labour force participation rate showed variability, with a mid-period increase followed by a decrease to 44.7%. These dynamics suggest a need for focused economic and employment policies to ensure a more stable and inclusive labour market recovery, addressing both the fluctuations and the rising discouragement among potential workforce participants.

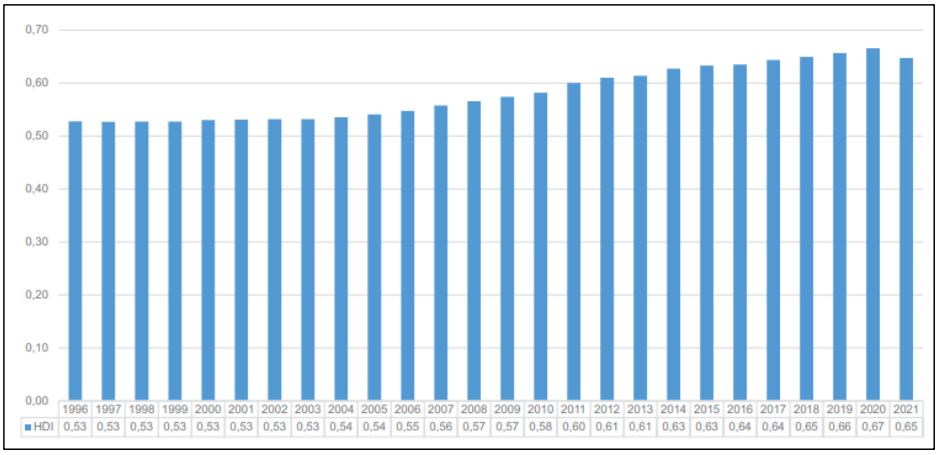


Figure 20: Northern Cape HDI

The Human Development Index (HDI) is used to measure the standard of living of citizens in a particular region. According to the HDI, the Northern Cape province is classified as a region with medium development. The province's HDI stands at 0.66, showing a slow but steady upward trend, which aligns with the United Nations (UN) definition of medium development. Despite the gradual improvement in quality of life, there is a consistent increase observed.

Figure 21 illustrates a rise in the attendance of educational institutions among individuals aged 7 to 24, climbing from 73.1% in 2002 to 76.3% in 2021. This increase was widespread across most provinces during this period, with the Northern Cape (+7.8 percentage points) and Free State (+7.3 percentage points) experiencing the largest increases.

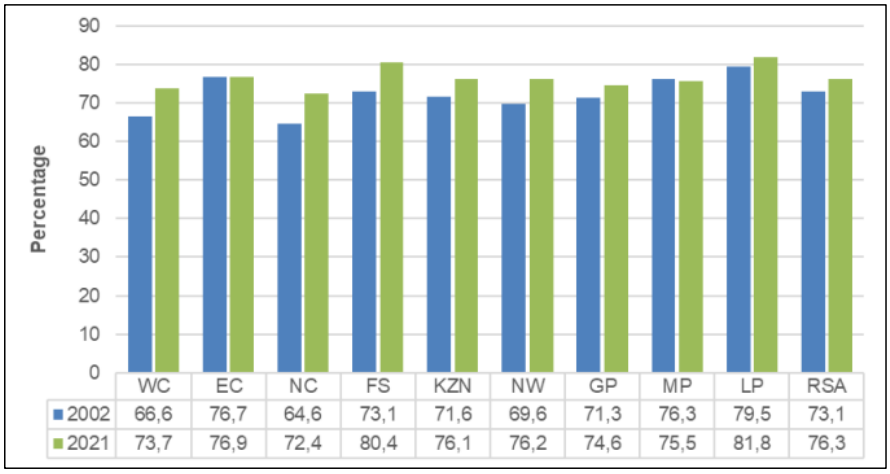


Figure 21: Ages 7- 24 Years Who Attended Educational Institutions

In 2019, the Northern Cape had a lower percentage of individuals aged 20 years and older with post-school education (9.2%) compared to South Africa as a whole (15.4%). Northern Cape also fell behind South Africa in upper secondary education, with 22.6% compared to South Africa's 25.1%. Additionally, Northern Cape had a higher percentage of individuals with no education (4.4%) than the national average for South Africa (3.7%). The largest education category in both was National Senior Certificate (NSC) Grade 12, but the province's percentage (29.1%) was slightly lower than the national average for SA (30.8%).

These findings from Figure 22 suggest that Northern Cape faces challenges in education attainment compared to the rest of SA, particularly in post-school education and upper secondary education, highlighting areas that may require targeted interventions to improve educational outcomes in the province.

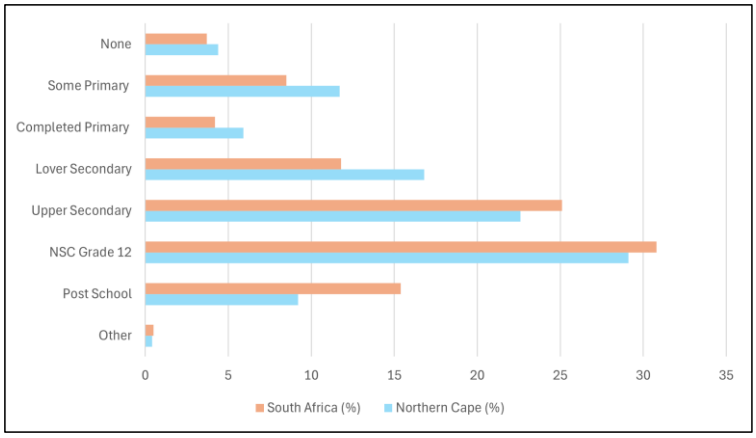


Figure 22: Education Attainment for Individuals Ages 20 Years and Older, 2019

In summary, the Northern Cape's population has been growing steadily, albeit at a slower rate compared to previous years, mirroring trends in other provinces. The province's demographic profile, characterised by a youthful population, aligns with the national average. However, there is a notable shift towards a female-dominated population in older age groups, potentially impacting the overall population growth rate. Economically, the Northern Cape experienced a decline in 2019, particularly in sectors like agriculture and construction, although there are signs of improvement in other sectors. These trends underscore the need for targeted policies to address economic disparities and support sustainable growth in the province.

5.4 District Municipalities Overview

The demographics of the Namakwa (NDM) and the ZF Mgcawu District Municipalities (ZFDM), through which the pipeline passes, will now be discussed, and compared.

The NDM, a Category C municipality in the Northern Cape Province, is the largest district in the province, comprising over a third of its geographical area. It is bordered by Namibia to the north, ZF Mgcawu District Municipality to the north-east and the Atlantic Ocean to the west. The municipality is comprised of six local municipalities: Nama Khoi, Hantam, Khai-Ma, Kamiesberg, Karoo Hoogland, and Richtersveld, with Springbok serving as its seat.

ZFDM, formerly known as Siyanda District Municipality, is another Category C municipality in the Northern Cape Province, occupying the mid-northern section and bordering Botswana to the north and Namibia to the west. It covers just under a third of the province's geographical area. The district comprises five local municipalities: Dawid Kruiper, Kai !Garib, Tsantsabane, !Kheis, and Kgatelopele, with Upington serving as the district municipal capital.

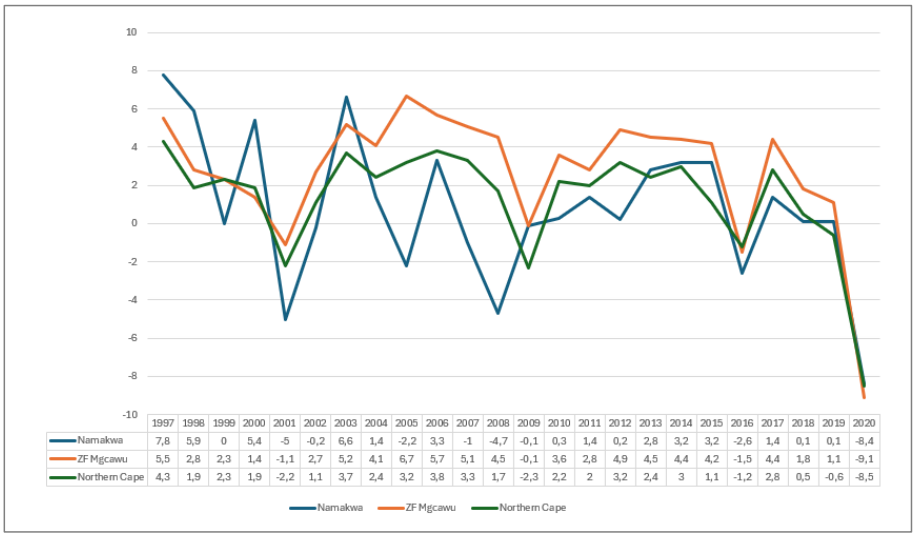
The population distribution across all three district municipalities is illustrated in the table below:

Table 5: District Population and Percent Share of Northern Cape Population, 2019

District Municipality	Population Size	Share %
Namakwa District Municipality	~139 381	10.4
ZF Mgcawu District Municipality	~284 391	21.1

While the NDM is the largest district in the province in terms of geographical area, it has a comparatively smaller population size than the ZFDM. The ZFDM contributes 21.1% to the total Northern Cape population, whereas NDM contributes 10.4% to the total population.

As seen in Figure 19, NDM contributes 11% to the provincial GDP, whereas ZFDM contributes 28%. These district municipalities have had fluctuating annual growth and contribution to the provincial GDP.



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Namakwa	7,8	5,9	0	5,4	-5	-0,2	6,6	1,4	-2,2	3,3	-1	-4,7	-0,1	0,3	1,4	0,2	2,8	3,2	3,2	-2,6	1,4	0,1	0,1	-8,4
ZF Mgcawu	5,5	2,8	2,3	1,4	-1,1	2,7	5,2	4,1	6,7	5,7	5,1	4,5	-0,1	3,6	2,8	4,9	4,5	4,4	4,2	-1,5	4,4	1,8	1,1	-9,1
Northern Cape	4,3	1,9	2,3	1,9	-2,2	1,1	3,7	2,4	3,2	3,8	3,3	1,7	-2,3	2,2	2	3,2	2,4	3	1,1	-1,2	2,8	0,5	-0,6	-8,5

Figure 23: Northern Cape and District Average Annual Growth

Between 1997 and 2020, the economic growth rates of NDM and ZFDM in the Northern Cape Province varied. NDM, although the largest district geographically, had a relatively low average annual economic growth. In contrast, ZFDM experienced higher economic growth over the same period. These trends contributed to the broader economic landscape of the Northern Cape. However, the data also revealed

fluctuations in growth rates, with both districts and the province experiencing periods of economic contraction, highlighting the importance of understanding and managing economic cycles for sustainable development.

In the district municipalities of NDM and ZFDM in the Northern Cape Province, several key sectors play significant roles in the local economy.

Namakwa is known for its rich mineral resources, particularly in mining activities such as diamonds, copper, and zinc. These mining operations contribute significantly to the district's economy and provide employment opportunities for local residents. Agriculture is also a crucial sector in Namakwa, with the cultivation of grapes, dates, and other fruits being prominent. The district's coastal location also supports fishing activities, adding to the economic diversity of the area.

In ZF Mgcawu, agriculture is a dominant sector, with large-scale irrigation schemes supporting the cultivation of crops like grapes, cotton, and vegetables. The district is known for its production of table grapes, which are exported internationally, contributing to the region's economic growth. The manufacturing sector in ZF Mgcawu is relatively small but includes food processing facilities that add value to the agricultural products grown in the area. Construction and trade sectors are also present, supporting the district's infrastructure development and retail activities. These sectors are vital for the economic development of NDM and ZFDM, and their performance will be further analysed in the local municipality section.

5.5 Local Municipalities Overview

With ~73 100 residents, Kai !Garib (KGLM) (located in the ZFDM) is the most populated municipality among those listed, making it an important hub in the area. Hantam (HLM) (located in the NDM), which has a population of ~21 083, comes in second, suggesting a smaller population size.

Table 6: Population by Municipality

Local Municipality	Population
Kai !Garib Local Municipality	73 100
Hantam Local Municipality	21 083

In the KGLM, approximately 13.4% of the population does not have access to electricity. This could be due to various factors. In the HLM, around 5.4% of the population lacks access to electricity. This lower percentage may be attributed to better infrastructure and development in the area compared to Kai !Garib. Nonetheless, both municipalities still have significant populations without access to this essential service, highlighting the need for continued efforts to improve electrification in these areas.

Table 7: Number of Households with No Access to Electricity

Local Municipality	No Access to Electricity
Kai !Garib	13.4%
Hantam	5.4%

In comparing the education levels between KGLM and HLM, despite the data being from different years, an analysis of the proportions of individuals with varying education levels within each dataset is necessary.

In 2018, Kai !Garib had a matric (Grade 12) completion rate of approximately 34.3% and a 13.2% rate of individuals with no schooling. In contrast, Hantam in 2020 had a matric completion rate of approximately 14.4% and a 12.9% rate of individuals with no schooling. While Kai !Garib had a higher matric completion rate compared to Hantam, both municipalities faced similar challenges regarding access to education. It's important to consider that direct comparisons may be limited by factors such as changes in population size, demographics, and educational policies over time, impacting the comparability of the datasets.

Table 8: Employment vs Unemployment per Municipality, 2018

Local Municipality	Employment	Unemployment
Kai !Garib	30.5%	12%
Hantam	37.7%	5.94%

In comparing the employment sectors of KGLM and HLM, notable differences emerge. Kai !Garib exhibits an employment rate of 30.5% and an unemployment rate of 12%, indicating a substantial portion of the population not engaged in the workforce. Conversely, Hantam displays a higher employment rate of 37.7% and a lower unemployment rate of 5.94%, suggesting a more favourable employment environment. This contrast implies that while both areas have room for improvement in reducing unemployment and enhancing job prospects, Hantam's employment sector appears more robust.

In 2017, KGLM exhibited varied access to piped water among its households. Approximately 44.46% of households had piped water inside the dwelling, however, a notable 7.64% of households still lacked formal piped water, indicating a need for improved infrastructure and service provision in certain areas. Conversely, HLM in the same year showed a higher overall access to piped water, with 58.8% of households reported to have this service. No data is provided for 2017 to show how many people lacked access to water, however, in 2016 only 2% of the population did not have access to clean drinking water.

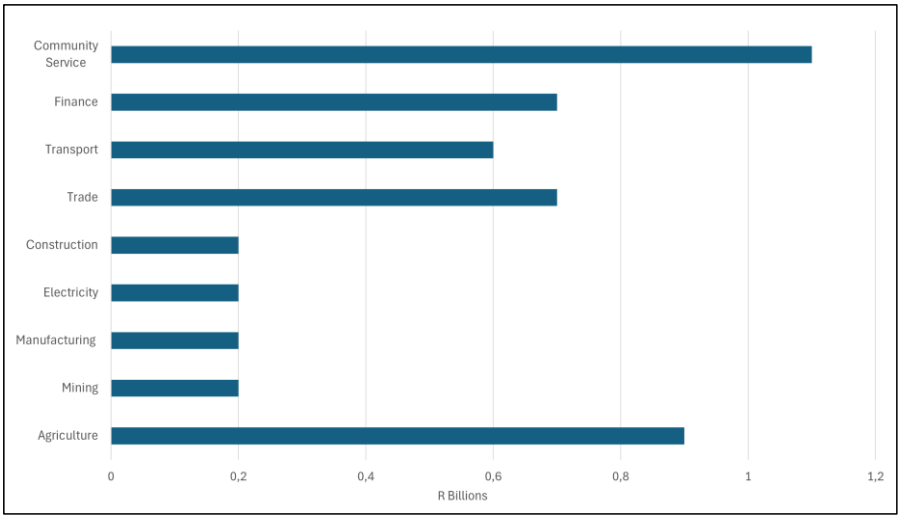


Figure 24: Kai !Garib Gross Value Added by sector in Billions (Rand)

In 2018, the community services sector emerged as the largest contributor to KGLM's economy, accounting for R 1.14 billion or 22.9% of the total Gross Value Added (GVA). Following closely behind is the agriculture sector, contributing 19.1% to the GVA, and the finance sector, contributing 14.7%. In contrast, the electricity sector made the smallest contribution, amounting to R 170 million or 3.43% of the total GVA.

Table 9: Hantam Gross Value Added by Sector in Millions (Rand)

Industry	2015	2020	% change
Primary Sector			
Agriculture, forestry and fishing	263	346	31%
Mining (and quarrying)	4	6	50%
Secondary Sector			
Manufacturing	20	27	35%
Electricity, gas and water	30	53	76%
Construction	44	36	-18%
Tertiary Sector			
Wholesale and retail trade, catering and accommodation	173	180	4%
Transport, storage and communication	141	165	17%
Finance, insurance, real estate and business services	181	228	25%
General government	134	188	40%
Community, social and personal services	279	362	30%

In 2015, HLM contributed 13% to the Gross Value Added (GVA) of the Namakwa district, which decreased to 12% by 2020. Despite this decline, the municipality's contributions remained stable at around 1.5% of the provincial economy, similar to 2011 levels. The tertiary sector was the largest contributor to Hantam's economy, accounting for 70.5% (R1 123 million) of the total GVA in 2020. The primary sector also showed growth, reaching 22% (R352 million) in 2020, while the secondary sector contributed 7.3% (R117 million). The proposed pipeline project increases the GVA of the local communities by contributing the construction and community service sectors in the region.

The installation of the Proposed KTE Brandvlei Water Pipeline Project presents a significant opportunity for enhancing the socio-economic profile of the Northern Cape, particularly in the local municipalities of Hantam and Kai !Garib along the proposed Pipeline route.

The proposed project will impact the socio-economic profile of these areas, with the impacts affecting the local municipalities. By improving access to water, the proposed KTE Brandvlei Water Pipeline Project can not only assist with meeting the basic needs of communities but also support agricultural activities and industrial development, thereby contributing to economic growth. The creation of employment opportunities and skill development programs will further boost the local economy and enhance the livelihoods of residents.

Additionally, the delivery of basic services through the water pipeline can improve the quality of life for many residents, fostering a more sustainable and inclusive community. Overall, the proposed KTE Brandvlei Water Pipeline Project is poised to potentially have multiple effects on the socio-economic landscape of the Northern Cape, paving the way for a more prosperous and sustainable future for its residents.

5.6 Stakeholder Engagement

Stakeholder engagement is a critical component of the Socio-Economic Impact Assessment process. It provides an opportunity for stakeholders to express their views, concerns, and suggestions regarding the proposed project. The engagement process for this report was designed to be inclusive, transparent, and respectful of all participants.

The stakeholder engagement process for this report included the following steps:

- **Stakeholder Identification:** We began by identifying a comprehensive list of stakeholders who could potentially be affected by or have an interest in the proposed project. This list included local community members, local and regional government officials, environmental and socio-economic advocacy groups, and others.
- **Information Dissemination:** We disseminated information about the proposed project and the Socio-Economic Impact Assessment process to identified stakeholders through surveys and on-site engagement.
- **Stakeholder Consultation:** We conducted stakeholder consultation to gather feedback on the proposed project through surveys and on-site engagement. This provided a platform for stakeholders to express their views, concerns, and suggestions.
- **Feedback Incorporation:** We carefully reviewed all feedback received during the stakeholder consultation process. This feedback was used to inform the Socio-Economic Impact Assessment and to develop appropriate mitigation strategies.
- **Ongoing Engagement:** We are committed to maintaining an open dialogue with stakeholders throughout the project lifecycle. We will continue to provide updates on the project's progress and to seek feedback on proposed mitigation strategies.

6 Key Social Impacts

This section highlights the key socio-economic issues identified during the SEIA study. The identification of socio-economic issues was based on:

- Review of project related information, including other specialist studies;
- Application of relevant legislation from a local to national level;
- Community engagement;
- Experience of the authors of the area and the local conditions; and
- Experience with similar projects.

This assessment considered the following points:

- The nature, extent and significance of the features within the socio-economic landscape being considered.
- The existing disturbance already present within the socio-economic landscape.

This chapter aims to identify and analyse the key socio-economic issues associated with the proposed project at various levels, including the national, provincial, district, local, and community levels. By delving into these issues, we can gain a comprehensive understanding of the social and economic challenges faced by the community and formulate appropriate strategies to address them.

The findings presented in this chapter are based on a comprehensive stakeholder engagement process, including surveys, interviews, and consultations with community members, local authorities, and other relevant stakeholders. The information gathered from these engagements serves as a foundation for identifying the key socio-economic issues that the project must consider in its planning, implementation, and evaluation stages.

Through a careful analysis of the identified issues, this chapter will provide valuable insights into the socio-economic context of the project area, highlighting the challenges and opportunities that exist. Moreover, it will present suggestions and recommendations on how the proposed project can address these issues, thereby maximising its positive impacts and ensuring the sustainable development of the community.

Overall, the identification of key socio-economic issues serves as a critical step in the project's socio-economic impact assessment process. It enables us to take a holistic view of the community's needs, aspirations, and constraints, guiding us in developing effective strategies and interventions that promote social equity, economic growth, and improved quality of life for the residents of the informal settlements.

Socio-economic impacts are an inherent part of any development project. Throughout the different phases of the project, including construction, operation, and decommissioning, socio-economic impacts

are anticipated to occur. These impacts can have either positive or negative consequences for the affected communities.

During the construction phase, the project may bring about positive socio-economic impacts such as job creation and economic opportunities for local residents. However, there can also be negative impacts, such as disruptions to daily life, increased traffic, and noise pollution. It is crucial to identify and understand these socio-economic impacts to ensure effective management and mitigation measures.

Similarly, during the operational phase, the project may have positive socio-economic impacts such as improved access to essential services, enhanced living conditions, and increased community cohesion. However, negative impacts such as changes in the social fabric, gentrification, and affordability challenges may also arise. Careful consideration and planning are necessary to maximise the positive impacts and mitigate any negative consequences.

Even during the decommissioning phase, socio-economic impacts may occur. Proper closure and rehabilitation of the project site are essential to minimise any potential negative social effects and ensure a smooth transition for the community.

To address these socio-economic issues, a comprehensive understanding of the impacts and their status is necessary. Depending on whether the impacts are positive or negative, appropriate measures, such as mitigation or enhancement, can be recommended for effective impact management.

By conducting a thorough analysis of the key socio-economic issues associated with the development of the proposed project, we can develop a comprehensive understanding of the socio-economic landscape and the specific needs of the communities involved. This knowledge will serve as the foundation for developing targeted interventions and strategies that aim to address these issues and bring about positive change.

Furthermore, it is important to emphasise that the identification of key socio-economic issues is not a static process. As the project progresses, new challenges and opportunities may emerge, requiring ongoing monitoring and assessment. Regular evaluation and adaptation of strategies will ensure that the project remains responsive to the evolving needs of the community and maximises its positive impact.

6.1 Assessment Criteria

Direct, indirect, and cumulative impacts associated with the projects must be assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high).

- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0 – 1 years) – assigned a score of 1.
  - the lifetime of the impact will be of a short duration (2 – 5 years) – assigned a score of 2.
  - medium-term (5 – 15 years) – assigned a score of 3.
  - long term (> 15 years) – assigned a score of 4; or
  - permanent – assigned a score of 5.
- The **consequences (magnitude),** quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1 – 5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- The **significance**, which shall be determined a synthesis of the characteristics described above and can be assessed as low, medium, or high.
- The **status**, which will be described as either positive, negative, or neutral.
- The degree to which the impact can be reversed.
- The degree to which the impact may cause irreplaceable loss of resources.
- The degree to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M)\,P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e., where this impact would not have a direct influence on the decision to develop in the area),
- 30 – 60 points: Medium (i.e., where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e., where the impact must have an influence on the decision process to develop in the area).

The summarising of assessment impacts in a prescribed table format including the rating values as per above criteria. Measures for inclusion in the Environmental Management Programme.

7 Impacts and Assessment

This chapter aims to rate the significance of the identified potential impacts pre-mitigation and post-mitigation. The potential impacts identified in this section are a result of both the environment in which the Project activity takes place, as well as the activity itself. The identification of potential impacts is performed by determining the potential source, possible pathways, and receptors. In essence, the potential for any change to a resource or receptor (i.e., environmental aspect) brought about by the presence of a Project component or by a Project-related activity has been identified as a potential impact.

The potential impacts are discussed per environmental feature/aspect and according to each phase of the Project i.e., the Construction, Operational and Decommissioning/Post Closure Phases. The significance, probability and duration of these potential impacts have been assessed based on the detailed specialist studies undertaken on the sensitivity of the receiving environment.

The SEIA adheres to local best practice guidelines, ensuring that the assessment is grounded in the specific socio-economic and cultural context of the Project area. It is important to distinguish between the direct and broader benefits to the surrounding community when considering the project's impact.

7.1 Determination of Significance of Impacts

Significance is determined through a synthesis of impact characteristics which include context and intensity of an impact. Context refers to the geographical scale (i.e., site, local, national, or global), whereas intensity is defined by the severity of the impact e.g., the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence. Significance is calculated as shown in Section 6.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

7.2 Impacts and Risk Assessment

The EIA Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

7.2.1 Construction Phase

The construction phase of the proposed KTE Brandvlei Water Pipeline Project is expected to bring a mix of socio-economic impacts, typical of large-scale infrastructure developments. These impacts, though primarily temporary and concentrated within the estimated 18 to 24 months construction period, could extend long-term effects on the local socio-economic environment if not managed properly. It's

crucial that the detailed design phase minimises permanent socio-economic impacts, avoiding poor placement of project components or mismanagement of construction activities.

The positive and negative socio-economic impacts identified and assessed for the construction phase includes:

Potential positive impacts:

- Job Creation: Employment opportunities for local workforce and contractors.
- Economic Stimulation: Increased economic activity from the influx of workers and related businesses.
- Infrastructure Development: Improvements in local infrastructure, such as roads and accommodation facilities for workers.
- Skill Development: Enhanced skills and training opportunities for the local workforce due to exposure to construction activities and technologies.

Potential negative impacts:

- Environmental Disturbance: Site clearing and construction equipment could disrupt local ecosystems.
- Community Disturbance: Noise, dust, and increased traffic from construction activities could affect the quality of life for nearby communities.
- Resource Consumption: Increased demand for water and local services, which could strain existing infrastructure.
- Waste Generation: Construction activities will generate waste, requiring effective management to avoid environmental contamination.

Table 10: Construction Phase Impact Tables for the Proposed KTE Brandvlei Water Pipeline Project

Impact: Employment of Workforce and Contractors.		
Nature: The employment of a local workforce for the construction of the proposed KTE Brandvlei Water Pipeline Project will lead to direct benefits such as job creation and skills transfer. This presents an opportunity for significant positive impacts on the local economy through increased income and the potential for long-term economic development. Fair and equitable labour practices are essential to ensure that these benefits are realised without leading to any human rights infringements.		
	Without Mitigation	**With Mitigation**

Extent	Regional (4)	Local (3)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	High (8)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (36)	Medium (52)
Status	Positive	Positive
Reversibility	Yes – Loss of Employment	Yes – Loss of Employment
Irreplaceable loss of resources?	Impact will improve the Job Market	Impact will improve the Job Market
Can impacts be mitigated?	Enhanced	Enhanced

Enhancement Measures

- To enhance the local employment, skills development and business opportunities associated with the construction phase, the following measures should be implemented:
- The developers must be committed to involving and benefiting the communities surrounding the development, contributing to their development and growth.
- It is recommended to conduct structured and proactive engagement sessions within the municipal district, to expose local small, micro, and medium enterprises which will benefit from the proposed development.
- It is recommended that a local procurement policy be adopted by the developer to maximise the benefit to the local economy, where feasible.
- Training and skills development programmes should be offered to employees of the development prior to the commencement of the construction phase.
- The communities which are most in need of employment on a local level should be considered for employment before outsourcing.
- Engage proactively with local stakeholders and implement transparent hiring practices to ensure equitable distribution of employment opportunities.

Cumulative Impact

The combined effect of the project's employment opportunities, skills development, and enhancement measures will result in a strengthened local job market, improved skills base, and overall socio-economic

upliftment of the community. The initiatives to eliminate unfair discrimination, targeted training, and development programs, and the emphasis on portable skills training will further enhance the long-term benefits to the community, ensuring sustainability and growth.

Residual Opportunities

- Initiatives to eliminate unfair discrimination in employment.
- Recruit and select suitably qualified individuals from the designated groups.
- Employees from designated groups who have been identified in the talent pool should be advanced and accelerated through targeted training and development programs.
- Assist employees in obtaining an initial vocational education and pre-qualification, as well as additional education and training that refreshes knowledge, skills, work and life competencies that are critical for overall development.
- Provide portable skills training to employees who express an interest in obtaining such training, with a special emphasis on employees who have been incapacitated or retrenched, in order for them to remain economically active, employable, or self-sustaining in their communities.
- Growth of talent is facilitated, thereby providing opportunities for all employees to contribute to their full potential.

Impact: Economic Multiplier Effects.

Nature: The construction phase of the proposed KTE Brandvlei Water Pipeline Project is expected to generate economic multiplier effects through the utilisation of local goods and services. This includes the supply of construction materials, machinery, and the provision of workforce essentials such as safety equipment, temporary accommodation, transportation, and other related services. An increased demand for these goods and services can stimulate local business growth and economic development. While the potential exists for a significant positive impact on local economies, the availability of locally sourced materials and services may present limitations.

	Without Mitigation	**With Mitigation**
Extent	Regional (4)	Local (3)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (30)	Medium (44)

Status	Positive	Positive
Reversibility	Yes – Loss of economic benefits	Yes – Loss of economic benefits
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Enhanced - Yes	Enhanced - Yes

Enhancement Measures

- Preference is given to suppliers that are local to the operation where the service will be consumed.
- Establishing liaison and communication structures with the district and local government structures.
- Liaise with the local governmental structures and municipal authorities in the labour-sending communities to ensure that group development initiatives are integrated into the economic and development plans of those areas.
- The continuous review of the economic development of the project during the implementation process will ensure that the project does not become static but is revised in terms of changing needs and also to ensure sustainability.
- Prior to the start of the construction contractor procurement, a database of local companies, specifically Historically Disadvantaged (HD) companies, that qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies, etc) should be identified and informed about the tender process and invited to bid on project-related work, if applicable.
- Engage with local authorities and business organisations to investigate the feasibility of obtaining construction materials, goods, and products from local suppliers, where possible.

Cumulative Impact

The project's economic multiplier effects, combined with the enhancement measures, will lead to a sustained boost in the local economy. The increased demand for local goods and services will not only benefit primary suppliers but will also have a ripple effect, benefiting secondary businesses and service providers. Over time, this will lead to a more robust and diversified local economy, with increased resilience and capacity for growth.

Residual Opportunities

- Improved local service sector, growth in local business.
- Community development and stimulation of the local economy.
- Growth in the local markets.

Impact: Influx of Jobseekers and Change in Population and Increased Pressure on Local Services.		
Nature: The construction phase of the proposed KTE Brandvlei Water Pipeline Project may attract a significant influx of job seekers and potentially alter the local population dynamics. This influx can place increased pressure on local economic and socio-economic infrastructure, affecting the size, structure, density, and demographic profile of the community. The anticipation of employment opportunities could lead to temporary increases in crime, socio-economic disruptions, and pressures on basic services such as housing, healthcare, and public utilities. Additionally, this scenario might exacerbate conflicts between local residents and newcomers due to potential differences in cultural and ethnic backgrounds, and potentially lead to a rise in unemployment levels among semi- and unskilled workers due to an oversupply in the labour market.		
	Without Mitigation	**With Mitigation**
Extent	Regional (4)	Local (3)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Medium (30)	Low (18)
Status	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
Mitigation Measures		
• A Community Liaison Officer should be appointed. • A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process. • Regular community meetings and information campaigns to manage expectations regarding employment opportunities, fostering understanding between local residents and incoming job seekers.		

- Prioritising local hiring to reduce the influx of external job seekers and support community development.
- Implementing training programs for local residents to enhance employability in the project, thereby reducing reliance on external semi-skilled and unskilled labour.
- Collaborating with local authorities to strengthen infrastructure and service provision (like healthcare, education, and public utilities) to accommodate population growth and increased demand.
- Establishing monitoring systems to track socio-economic impacts and setting up conflict resolution platforms to address any emerging issues between local and newcomer communities.
- Working with local law enforcement to implement crime prevention strategies and ensure public safety.

Cumulative Impact

The combined effects of the influx of jobseekers and the change in population, even with mitigation measures in place, could lead to a strain on local resources, potential socio-economic disruptions, and a temporary increase in crime rates. The cumulative impact also encompasses the potential for heightened socio-economic tensions due to perceived inequalities in job distribution and benefits from the project. However, with the proposed mitigation measures, the severity of these impacts can be reduced, leading to a more controlled and manageable influx, and ensuring that the local community benefits from the project in a sustainable manner.

Residual Risks

Potential for conflict: If there are perceptions of unfair hiring practices or unequal distribution of project benefits, this could lead to social tensions or conflicts, which could have implications for local safety and security. This is a potential residual impact as it is dependent on perceptions and socio-economic dynamics, which can be difficult to fully mitigate.

Impact: Safety and Security Impacts.

Nature: The construction phase of the proposed KTE Brandvlei Water Pipeline Project may lead to a temporary increase in safety and security concerns, mainly due to the influx of construction workers and the operational activities associated with the project. This increase could potentially elevate theft incidents, including construction material theft, and unauthorised access to the construction sites, posing risks to both the project's assets and the surrounding communities. The presence of a large construction workforce might also increase the risk of accidental injuries and escalate safety concerns for both the workers and local residents.

	Without Mitigation	**With Mitigation**
Extent	Regional (3)	Local (2)
Duration	Short-term (2)	Short-term (2)

Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Medium (33)	Low (16)
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes

Mitigation Measures

- Safety awareness and training as well as positive behaviour reinforcement.
- Improving system monitoring and analysis to improve risk management.
- Making the surrounding landowners aware of the dangers associated with the influx of workers during the construction period.
- Identifying abandoned buildings and utilizing them or ensuring they cannot be used for malicious activities.
- Ensuring that access cannot be gained to surrounding properties.
- Encourage employees to stop working when a workplace is considered unsafe and/or to prevent unsafe actions.
- Education, Training and Development Services must be implemented.
- Access in and out of the construction area should be strictly controlled.
- Have clear rules and regulations for access to the proposed site to control loitering.
- A comprehensive employee induction programme would cover land access protocols, fire management and road safety must be prepared.

Cumulative Impact

The cumulative safety and security impacts during the construction phase, particularly concerning the potential increase in crime and safety incidents, can significantly affect the local community's perception of the project and their overall well-being. With the implementation of comprehensive mitigation strategies, the project can minimise these impacts, maintaining a secure environment for both the workforce and the local population, and ensuring that the project contributes positively to the community's safety and security standards.

Residual Risks
• Potential for increased crime: Despite mitigation measures, there's always a risk of a temporary spike in crime rates due to the influx of outsiders and increased activity in the area. • Disturbance to local communities: The presence of construction activities and workers can lead to disturbances in daily life, affecting the well-being of local residents. • Strain on local infrastructure: The increased activity can put a strain on local roads, utilities, and other infrastructure, leading to wear and tear or potential breakdowns.

Impact: Increased Probability of Fire Risk

Nature: The construction phase of the proposed KTE Brandvlei Water Pipeline Project involves activities that could elevate the risk of accidental fires. This risk could arise from construction operations like welding, use of heavy machinery, and the storage of flammable materials, potentially endangering surrounding areas and properties.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Improbable (2)
Significance	Medium (30)	Low (16)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes
Mitigation Measures		

- The contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.
- No fires are to be made on site for any reason.
- No hunting or cooking of any animals or plants in or around the development footprint.

Cumulative Impact

The cumulative impact of an increased probability of fire risk during the construction phase is a matter of grave concern, not just for the immediate vicinity but also for broader ecosystems and communities. The combination of various fire-prone activities—such as welding, electrical work, and the use of flammable materials—across multiple construction sites can substantially elevate the fire risk level. When this is aggregated over multiple construction projects and durations, the cumulative effect can severely strain local fire-fighting resources and emergency services. Additionally, recurring incidents could lead to a degradation of local air quality due to smoke and pollutants, impact local flora and fauna, and contribute to long-term environmental degradation. Furthermore, the psychological toll on local residents from elevated fire risks could result in reduced property values and an increased desire to relocate, affecting the socio-economic fabric of the community. Overall, the cumulative impact of increased fire risk during construction is a complex interplay of environmental, social, and economic factors that could have lasting repercussions.

Residual Risks

While mitigation measures can significantly reduce the risk of fire, a residual risk may still exist due to unforeseen circumstances or extreme environmental conditions. Continuous monitoring and adherence to fire safety protocols are essential to manage this risk effectively throughout the construction phase, ensuring the safety of the project site, its workers, and the surrounding community.

Impact: Nuisance Impacts (Noise and Dust)

Nature: The construction activities for the proposed KTE Brandvlei Water Pipeline Project, including the use of heavy machinery, movement of vehicles, and site clearing, are expected to generate significant levels of noise and dust. These nuisance impacts could affect the well-being and quality of life of nearby residents and sensitive ecosystems.

	Without Mitigation	**With Mitigation**
Extent	Local (2)	Local (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Low (4)

Probability	Highly Probable (4)	Probable (3)
Significance	Medium (40)	Low (24)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	Yes

Mitigation Measures

- During construction, care should be taken to ensure that noise from construction vehicles and plant equipment does not intrude on the farms and residential areas nearby. Plant equipment such as generators, compressors, concrete mixers, and vehicles should be kept in good working order and, where possible, equipped with effective exhaust mufflers.
- The movement of construction vehicles on the site should be confined to agreed access road/s.
- Heavy vehicle movement during the construction phase should be timed (where possible) to avoid times of the week, such as weekends, when the volume of traffic on the access roads may be higher.
- Dust suppression measures must be implemented on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers.

Cumulative Impact

The combined effects of noise and dust from construction activities can lead to a significant disturbance for local residents and other sensitive receptors. Over time, these nuisances can accumulate, leading to a decrease in the quality of life for those living or working nearby. The cumulative impact of these nuisances can also affect local ecosystems, particularly if dust settles on nearby water sources or vegetation.

Residual Risks

Despite the implementation of mitigation measures, there may remain a residual level of nuisance impacts due to unforeseen conditions or the sheer scale of construction activities. Ongoing monitoring and adaptive management will be essential to minimise these impacts as much as possible and ensure compliance with environmental and health standards.

7.2.2 Operational Phase

It is anticipated that the proposed KTE Brandvlei Water Pipeline Project will operate for approximately 50-100 years or as long as required by the development.

The potential positive and negative socio-economic impacts that could arise because of the operation of the proposed project include the following:

- Direct and indirect employment opportunities.
- Contribution to local economic development and socio-economic upliftment; and
- Enhanced Water Supply and Security.

Table 11: Operational Phase Impact Tables for Proposed KTE Brandvlei Water Pipeline Project

Impact: Direct and Indirect Employment Opportunities.		
Nature: During the operational phase, the project continues to offer employment opportunities, although at a reduced scale compared to the construction phase. Direct employment largely involves roles related to maintenance, monitoring, and management of the pipeline. These roles are essential for ensuring the smooth and efficient functioning of the bulk water system infrastructure and include activities like routine inspections, repairs, and necessary upgrades. Indirect employment opportunities are also generated, supporting local businesses and industries that provide ancillary services and supplies for the operational needs of the pipeline. These roles may include local supply of maintenance materials, logistical support, and specialised technical services.		
	Without Mitigation	**With Mitigation**
Extent	Regional (4)	Regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (36)	Medium (52)
Status	Positive	Positive
Reversibility	Low	Low

Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Enhanced - Yes	Enhanced - Yes

Enhancement Measures

- Local Hiring: Prioritise hiring from the local community for all available positions. This will ensure that the benefits of employment are directly felt within the local community.
- Skills Transfer: In cases where highly skilled expertise is required, provide provisions for skills transfer. This will facilitate knowledge sharing within the local workforce and enhance the overall skill level of the community.
- Support for Local Businesses: Encourage the involvement of local businesses in providing materials, goods, and services during the operational phase of the project. This can stimulate entrepreneurial growth and create indirect job opportunities.
- Community Engagement: Maintain open lines of communication with the local community through the development's existing community liaison officer. This will ensure that job opportunities are communicated effectively and that local residents are given fair consideration in the hiring process.
- Fair Labour Practices: Align the project with the development's socio-economic labour plan to ensure fair labour practices and safe working conditions for all workers.

Cumulative Impact

The sustained employment opportunities during the operational phase will lead to long-term economic stability and growth in the region. The direct and indirect job opportunities will not only benefit the immediate families of the employed but will also have a ripple effect on the local economy. As more individuals gain employment, there will be an increase in disposable income, leading to higher consumer spending, which can stimulate other sectors of the local economy.

Residual Opportunities

- Economic Upliftment: The employment opportunities during the operational phase will lead to an upliftment in the overall economic status of the region. This can result in improved living standards, better access to education, and healthcare for the local community.
- Skills Development: The emphasis on skills transfer and training will ensure that the local workforce is better equipped for future job opportunities. This can lead to a more skilled and competitive workforce in the region.
- Entrepreneurial Growth: With the support for local businesses and the increase in consumer spending, there's potential for entrepreneurial growth. Local entrepreneurs can capitalise on the increased demand for goods and services, leading to the establishment of new businesses and further job creation.

Impact: Economic Multiplier Effects.		
Nature: Economic multiplier effects from the sustained operation and maintenance of the proposed KTE Brandvlei Water Pipeline present numerous opportunities. These include, but are not limited to, the provision of maintenance materials and equipment, ongoing workforce essentials such as services, safety equipment, ablution, accommodation, transportation, and so forth. The consistent demand for goods and services can bolster local businesses and foster local economic development. However, the sourcing of local materials and services might face constraints due to availability.		
	Without Mitigation	**With Mitigation**
Extent	Regional (4)	Regional (3)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (3)	Low (4)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (33)	Medium (44)
Status	Positive	Positive
Reversibility	Yes – Loss of economic benefits	Yes – Loss of economic benefits
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Enhanced - Yes	Enhanced - Yes
Enhancement Measures		
• Local Supplier Engagement and Development: Actively engage with local suppliers to understand their capabilities and limitations. Offer support and development programs to help them meet the project's needs. This could include training in specific skills, quality standards, or business management. • Community Liaison Officers (CLOs): Employ CLOs to facilitate communication between the project and local businesses, ensuring that the needs of both are met and that opportunities are fairly distributed. • Investment in Local Capacity Building: Invest in local infrastructure and capacity building to enable local businesses to scale up and meet the operational or maintenance demands of the project, where feasible. This could include financial support, technology transfer, or infrastructure improvements.		

- Long-term Community Development Plans: Work with local authorities and community groups to develop and implement long-term economic development plans that align with the project's long-term presence and potential for economic stimulation.
- Transparent Procurement Processes: Establish transparent and fair procurement processes that give local businesses a fair chance to compete for services required such as maintenance contracts, ensuring equitable opportunity distribution.

Cumulative Impact

The project's economic multiplier effects, combined with the enhancement measures, will lead to a sustained boost in the local economy. The increased demand for local goods and services will not only benefit primary suppliers but will also have a ripple effect, benefiting secondary businesses and service providers. Over time, this will lead to a more robust and diversified local economy, with increased resilience and capacity for growth.

Residual Opportunities

- Improved local service sector, growth in local business.
- Community development and stimulation of the local economy.
- Growth in the local markets.

Impact: Enhanced Water Supply and Security.

Nature: The operational phase of the proposed KTE Brandvlei Water Pipeline Project aims to significantly enhance water supply and security, particularly in areas prone to water scarcity. This development is critical in supporting sustainable water resource management and ensuring a stable water supply for agricultural, industrial, and residential use. Enhanced water security can improve public health standards, increase agricultural productivity, and facilitate economic development.

	Without Mitigation	**With Mitigation**
Extent	Regional (3)	Regional (3)
Duration	Long Term (4)	Long Term (4)
Magnitude	Moderate (6)	High (8)
Probability	Probable (3)	Highly Probable (4)
Significance	Medium (39)	Medium (60)
Status	Positive	Positive

Reversibility	Low	Low
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Enhanced - Yes	Enhanced - Yes

Enhancement Measures

- Infrastructure Upgrades: Implement advanced water treatment and monitoring technologies to ensure water quality and sustainability.
- Stakeholder Engagement: Work closely with local communities and stakeholders to manage water resources effectively and address concerns related to water distribution and access.
- Water Conservation Initiatives: Promote water conservation through community education programs and the introduction of water-saving technologies in homes and industries.

Cumulative Impact

The cumulative impact of the proposed pipeline project is a robust improvement in regional water management capabilities. Stable and secure water supplies contribute to healthier communities, more productive agricultural sectors, and resilient economic conditions, thereby supporting overall regional development.

Residual Opportunities

- Long-Term Employment Growth: The demand for maintenance and operational expertise can contribute to long-term employment growth in sectors directly and indirectly associated with the community services industry.
- Agricultural Development: Enhanced water security can expand irrigation capabilities and introduce high-value agricultural practices, potentially increasing crop yields and farmer incomes.
- Environmental Sustainability: Effective water management helps in maintaining ecological balance, supporting biodiversity, and reducing the incidence of droughts and floods.
- Community Development: With improved infrastructure, there can be a significant uplift in community development initiatives, including new educational facilities, healthcare services, and community centres, which in turn can spur further job creation and economic activities for
- Community Health and Sanitation: Improved water supply ensures better public health outcomes through cleaner drinking water and enhanced sanitation facilities.

7.2.3 Decommissioning Phase

For the decommissioning phase of the proposed KTE Brandvlei Water Pipeline Project, while a long-term consideration, requires careful planning to ensure minimal socio-economic impacts. The goal is to responsibly dismantle the water pipeline infrastructure when it's no longer needed or at the end of its operational life. Key considerations include:

- **Community Engagement**: Proactively communicate with local stakeholders about the decommissioning process, timelines, and expected changes.
- **Employment Transition**: Develop strategies for the re-employment or retraining of workers affected by the decommissioning.
- **Land Rehabilitation**: Plan for the restoration of land used for the project, ensuring it's returned to a state suitable for future use, whether for ecological, agricultural, or community purposes.
- **Environmental Protection**: Implement measures to minimise environmental impacts during the dismantling process, including waste management and pollution prevention.

This approach ensures the decommissioning phase is managed responsibly, aligning with local sustainability goals and community expectations.

7.2.4 Cumulative Impact

The potential cumulative impacts of the proposed KTE Brandvlei Water Pipeline Project on the local communities and environment will be primarily linked to resource utilisation and socio-economic changes. Key considerations include:

- **Economic Shifts**: Evaluating how the introduction of the water pipeline and its associated activities may shift local economic dynamics, including potential displacement of existing businesses or changes in employment patterns.
- **Infrastructure Strain**: Considering the long-term effects of increased traffic, use of public services, and other infrastructural demands that may strain local capacities and necessitate further developments or upgrades.
- **Perceived or Actual Change in Land Use**: Analysing the impact of the water pipeline on overall land use and character of the area, including changes in land accessibility and use patterns.

These impacts require a comprehensive assessment that considers both direct and indirect effects over time. The cumulative impacts should be understood as the collective change in socio-economic conditions, influenced by the pipeline alongside ongoing regional development activities.

The establishment of the proposed KTE Brandvlei Water Pipeline Project is expected to have transformative effects on the community and local municipality, leading to various impacts:

- People:
  - Skills development and training opportunities.
  - Employment opportunities during construction and operation phases.
  - Improved socio-economic outcomes due to investments in community development:
  - Health improvements.
  - Education enhancements.
  - Increased economic participation.
  - Socio-economic cohesion among community beneficiaries.
  - Increased sense of prestige for the community and town.
- Planet:
  - Contribution to the regional water supply with minimal environmental disruption.
  - Implementation of environmental management plans to mitigate impacts on local ecosystems.
- Profit:
  - Increased revenue opportunities for the local municipality.
  - Increased economic activity in the local community and broader municipality.
  - Investment in socio-economic and commercial infrastructure to stimulate economic growth.

The cumulative impacts of the proposed KTE Brandvlei Water Pipeline Project, particularly when considered in conjunction with other regional developments, offer socio-economic prospects for the area. These include job creation, skill development, and enhanced local services. The project's presence can benefit the local, regional, and national economies through various economic activities related to construction, operation, and maintenance. The cumulative impact at the municipal level can be positive, with potential for operations and maintenance companies to focus on education and training initiatives, contributing to the long-term development of the local workforce.

Table 12: Cumulative Impact Tables for Proposed KTE Brandvlei Water Pipeline Project

• **Nature:** An increase in employment opportunities, skills development, and business opportunities with the establishment of the proposed KTE Brandvlei Water Pipeline Project.

	Overall Impact of the Proposed Project Considered in Isolation	Cumulative Impact of the Project and Other Projects in the Area
Extent	Regional (3)	Regional (4)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	Medium (33)	Medium (42)
Status (positive or negative)	Positive	Positive
Reversibility	N/A	N/A
Irreplaceable loss of resources?	N/A	N/A
Can impacts be mitigated?	Yes	Yes
Confidence in findings: High.		
Enhancement Measures		
• Adopt local employment policies to ensure that job creation benefits the community surrounding the pipeline. • Utilise local service providers for construction, maintenance, and operational needs to enhance business opportunities in the area. • Implement skills development programs in partnership with local educational institutions and technical training centres to prepare the local workforce for opportunities arising from the project and other similar developments in the region.		

• **Nature**: Negative impacts and change to the local economy with an in-migration of labourers, businesses, and jobseekers to the project area.		
	Overall Impact of the Proposed Project Considered in Isolation	**Cumulative Impact of the Project and Other Projects in the Area**
Extent	Regional (3)	Regional (4)
Duration	Long-term (4)	Long-term (4)

Magnitude	Low (3)	Low (4)
Probability	Improbable (2)	Improbable (2)
Significance	Low (20)	Low (24)
Status (positive or negative)	Negative	Negative
Reversibility	Yes	
Irreplaceable loss of resources?	No	
Can impacts be mitigated?	Yes	
Confidence in findings: High.		
Mitigation Measures		
• Develop and enforce a local recruitment policy to prioritise hiring from the surrounding communities, thereby reducing the need for extensive in-migration. • Collaborate with local government agencies and community organisations to align the project's development with the local area's needs, ensuring that service provisions meet the requirements of both existing residents and newcomers. • Establish joint ventures or partnerships with community organisations, potentially through Trusts, to provide tangible benefits to local communities, including employment opportunities and essential services. • Formulate and distribute a clear recruitment protocol in partnership with the local municipality and community leaders, ensuring transparent communication about employment processes.		

7.3 Issues Associated with the No-Go Option

The No-Go option, which involves not proceeding with the proposed KTE Brandvlei Water Pipeline Project, presents several issues and missed opportunities for the region:

- **Lack of Infrastructure Improvement**: The absence of the pipeline means that the planned improvements in water infrastructure will not materialise. This could lead to continued or worsened water supply issues in the region, potentially affecting residential, commercial, and industrial users.
- **Economic Opportunities**: Not proceeding with the project would mean a loss of potential economic opportunities. The construction and maintenance of the pipeline are expected to create jobs and stimulate local businesses. The No-Go option would result in these opportunities being unrealised.

- **Water Availability and Capacity**: The proposed KTE Brandvlei Water Pipeline is designed to improve water availability and capacity within the region. The No-Go option would mean continuing with the existing, possibly less efficient, infrastructure, which could be less capable of meeting growing water demands.
- **Socio-Economic Impact**: The project likely includes components of community development and engagement. The No-Go option would mean these planned community benefits, such as improved infrastructure, community programs, or educational initiatives, would not be realised.

In conclusion, while the No-Go option avoids the negative socio-economic impacts associated with the construction and operation of the proposed KTE Brandvlei Water Pipeline Project, it also forgoes the potential benefits in terms of improved water infrastructure, economic development and social advancement. This option may leave existing challenges unaddressed and miss out on significant opportunities for regional development.

8 Monitoring and Compliance (EMPr)

8.1 Construction Phase

Table 13: Construction Phase Socio-Economic Impact Assessments inputs for EMPr

Impact	Monitoring Action	Responsible Party	Compliance Indicator	Frequency
Employment of Workforce and Contractors	Monitor the number and proportion of local hires vs. total workforce.	Holder of the EA	Ratio of local hires.	Monthly
	Review adherence to labour policies and worker rights.	Holder of the EA	Compliance with labour laws and ethical hiring practices.	Monthly
	Assess the impact of employment on local economic development.	Holder of the EA	Increase in local economic activity.	Quarterly
Economic Multiplier Effects	Track local procurement of goods and services.	EPC	Percentage of local procurement.	Bi-monthly

	Assess the impact on local business growth.	EPC	Number of local businesses benefiting from the project.	Bi-monthly
	Evaluate the development of new local enterprises related to the project.	Holder of the EA	Number of new businesses established.	Quarterly
Influx of Jobseekers, Change in Population and Increased Pressure on Local Services	Monitor changes in local population and employment levels.	Community Liaison Officer	Changes in local population demographics; unemployment rates.	Quarterly
	Assess the impact on local services (health, education, etc.).	Community Liaison Officer	Service demand levels.	Quarterly
	Evaluate social cohesion and potential for conflict due to population change.	Holder of the EA	Incidents of social unrest or conflict.	Quarterly

Safety and Security Impacts	Record incidents of theft, vandalism, or other criminal activities.	EPC	Number of reported incidents.	Weekly
	Conduct regular security assessments, access control to the sites and review of monitoring tools and update measures as needed.	EPC	Effectiveness and adequacy of security measures and frequency of incidences of unauthorized access.	Monthly
	Collaborate with local law enforcement and community watch groups.	EPC	Level of cooperation with local authorities.	Monthly
Increased Probability of Fire Risk	Monitor and record any fire incidents.	EPC	Number of fire incidents.	As incidents occur
	Ensure adherence to fire safety protocols.	EPC	Compliance with fire safety protocols.	As incidents occur
	Conduct fire risk assessments and update prevention strategies.	EPC	Effectiveness of fire prevention measures.	Bi-monthly
Nuisance Impacts (Noise and Dust)	Regular monitoring of	Environmental Officer	Noise and dust measurements.	Weekly

	noise and dust levels.			
	Assess impact on residents and ecosystems.	Environmental Officer	Community feedback; ecological impact assessments.	Bi-monthly
	Implement and evaluate effectiveness of noise and dust control measures.	Environmental Officer	Effectiveness of control measures.	Monthly

8.2 Operational Phase

Table 14: Operational Phase Socio-Economic Impact Assessments inputs for EMPr

Impact	Monitoring Action	Responsible Party	Compliance Indicator	Frequency
Direct and Indirect Employment Opportunities	Monitor employment levels and assess direct and indirect employment generated by the project.	Holder of the EA	Employment statistics.	Quarterly
	Assess local business growth and impact on local businesses providing services.	Holder of the EA	Growth in local businesses.	Quarterly
	Review effectiveness of skills development and training programs.	Holder of the EA	Success rates and feedback of training programs.	Quarterly
Economic Multiplier Effects	Track procurement of local goods and services.	EPC	Local procurement statistics.	Bi-monthly
	Evaluate broader economic impact on local and regional economy.	EPC	Economic impact assessments.	Bi-monthly
	Maintain communication with local businesses for emerging needs/opportunities.	EPC	Records of engagement and feedback.	Bi-monthly
Enhanced Water Supply and Security	Monitor improvements in water supply reliability and reach.	Holder of the EA	Water supply metrics.	Bi-annually
	Assess socio-economic benefits from improved water security.	Holder of the EA	Socio-economic impact studies.	Bi-annually
	Monitor impact on agricultural productivity due to improved water supply.	Holder of the EA	Agricultural productivity reports.	Bi-annually

9 Environmental Impact Statement

9.1 Key Findings

From a socio-economic perspective it is concluded that the proposed KTE Brandvlei Water Pipeline Project is supported, but that mitigation measures should be implemented and adhered to. Positive and negative socio-economic impacts have been identified. The assessment of the key issues indicated that there are no negative impacts that can be classified as fatal flaws, and which are of such significance that it cannot be successfully mitigated. Positive impacts could be enhanced by implementing appropriate enhancement measures and through careful planning.

Based on the socio-economic impact assessment, the following general conclusions and findings can be made:

- The development of the proposed KTE Brandvlei Water Pipeline is a critical step in addressing the socio-economic challenges faced by residents. The assessment identified key issues such as inadequate access to water, sanitation, and safety concerns. By developing these services, the project aims to improve living conditions, enhance safety, and provide equal opportunities for all residents.
- The proposed development aligns with the national, provincial, and local policy frameworks, emphasizing the importance of inclusive housing development, improved service delivery, and sustainable urban development. It supports the goals outlined in the National Development Plan and various housing policies, which prioritise the provision of basic services and the enhancement of living conditions in informal settlements.
- The development of the proposed pipeline will have positive socio-economic impacts. Job creation is expected during the construction phase, stimulating local economic activity through the procurement of construction materials and services. It also offers opportunities for skills development and training for the local labour force, contributing to improved employment prospects and income generation. The project will result in enhanced access to basic services and amenities, improving the standard of living and quality of life for affected communities.
- The stakeholder engagement process played a vital role in shaping the proposed KTE Brandvlei Pipeline Project. Community members and other stakeholders provided valuable insights and feedback, highlighting the importance of basic services, job opportunities, and addressing major socio-economic issues.
- Mitigation measures are necessary to address potential negative impacts associated with the construction and operational phases. Temporary inconveniences and disruptions during construction should be minimised through effective project management and communication. Challenges in managing and maintaining the formalised services effectively require the implementation of efficient management practices, ongoing monitoring, and community

engagement. Measures should also be in place to manage and resolve potential conflicts or disputes related to the allocation of formalised services.

- The cumulative impacts of the project can contribute to sustained economic growth, improved infrastructure development, and enhanced local services. Economic growth will be driven by job creation, increased business activity, and revenue generation. Infrastructure development can result in improved transportation networks, utilities, and community facilities, enhancing access to services.
- However, the cumulative impacts also present challenges that need to be addressed. The increased demand on resources, including water, energy, and land must be managed efficiently to prevent scarcity. Measures should be in place to minimise social displacement and avoid exacerbating socio-economic inequalities.
- By considering diverse viewpoints and suggestions, the final Socio-Economic Impact Assessment (SEIA) will provide a comprehensive analysis of potential socio-economic impacts. This will ensure that decision-makers have a complete understanding of the project's implications, enabling them to make informed decisions that maximise benefits and minimise adverse effects.

The proposed KTE Brandvlei Water Pipeline development in the Northern Cape province can assist in addressing socio-economic challenges, enhancing quality of life, promoting equitable development, and creating sustainable opportunities for the community. By considering affordability, implementing mitigation measures, and engaging stakeholders, the project can maximise its positive impacts while minimising any negative consequences. The project's alignment with policy frameworks and its potential to contribute to sustained economic growth, improved infrastructure, and enhanced local services make it a promising endeavour for the socio-economic development of the area.

9.2 Recommendations

The following recommendations are made based on the SEIA and a thorough review of the concerns and suggestions raised by stakeholders and interested and affected parties during the stakeholder engagement process. The proposed mitigation measures should be implemented to limit the negative impacts and enhance the positive impacts.

- **Employment and Economic Stimulation:** Given the scarcity of job opportunities for the unskilled and semi-skilled in the study area, it is recommended that local labour be utilised to enhance the positive impact of employment creation. This will also mitigate potential negative impacts associated with the inflow of outsiders to the area, increased pressure on infrastructure and services, and safety and security concerns. Local businesses should be involved in construction activities where possible.

- **Local Supplier Inclusion:** To enhance the economic multiplier effect, locals should be allowed an opportunity to be included in a list of possible local suppliers and service providers. This will further stimulate the local economy and offer valuable income opportunities for local residents.
- **Infrastructure and Land Use:** The project's location amidst active agricultural lands means that collaboration with local farmers and industries is essential. A plan that minimises disruptions to agricultural activities, especially in the farms listed under the project's purview, should be developed. Additionally, leveraging existing infrastructure, such as roads, can reduce socio-economic impacts, ensuring that the project integrates seamlessly into the existing landscape. Given the potential increase in demand for local services such as housing, healthcare, transportation, and education, it is recommended that the project collaborates with local authorities and stakeholders to develop plans and support mechanisms to address these needs, where feasible. This could include initiatives such as housing plans, healthcare capacity enhancement, transportation infrastructure upgrades, and educational planning and investment.
- **Mitigation of Construction Impacts:** Measures should be put in place to carefully mitigate negative impacts associated with the construction period. This will ensure minimal disruption to the local community and environment.
- **Safety and Security:** Safety and security concerns should be considered during the planning and construction phases of the proposed project. The pipeline should be access controlled and have safety and security measures in place.
- **Community Engagement:** The developers should work through a community liaison officer to ensure that the local community is kept informed about the project and any potential impacts. This will also provide a channel for addressing any concerns or grievances that may arise.

By implementing these recommendations, the proposed development can ensure that it contributes positively to the local community and economy, while minimising any potential negative impacts.

9.3 Conclusion

During the Assessment Phase of the Socio-Economic Impact Assessment (SEIA), a comprehensive site visit was conducted to gather valuable insights and engage with key stakeholders and interested and affected parties.

The primary objective of the site visit was to provide stakeholders with a clear understanding of the proposed development, including its location, scope, and planned activities during both the construction and operational phases. To facilitate effective communication, visual aids such as maps and diagrams were utilised to illustrate the project's spatial aspects and provide stakeholders with a tangible representation of the planned development.

The feedback received from the site visit/surveys plays a crucial role in informing the analysis of the project's socio-economic impacts. By incorporating stakeholder perceptions and concerns, the

assessment can provide a comprehensive understanding of the potential positive and negative socio-economic effects associated with the proposed development.

Through a rigorous review of policies, stakeholder engagement processes, and data analysis, this assessment has identified key socio-economic issues at various levels and examined the positive and negative impacts during the construction and operational phases.

At the district and local levels, the assessment identified challenges related to infrastructure, basic service provision, economic opportunities, and community development. These findings highlight the importance of coordination, capacity building, and effective implementation at the local level. By engaging with local municipalities, addressing land tenure issues, and ensuring transparency and accountability, the project can promote sustainable development and enhance the quality of life in the target communities.

The assessment also acknowledged the significance of enhanced access to basic services, amenities, and infrastructure development in informal settlements. These positive impacts can lead to improved living conditions, increased social inclusion, and enhanced community development. However, it is crucial to address potential challenges such as temporary inconveniences, disruptions to local businesses, and the risk of short-term social and economic challenges for affected residents. By implementing mitigation measures, such as effective project scheduling, stakeholder engagement, and support mechanisms, these negative impacts can be minimised.

The proposed project is unlikely to result in permanent damaging socio-economic impacts. From a socio-economic perspective, it is concluded that the project is acceptable subject to the implementation of the recommended mitigation and enhancement measures and management actions identified for the project. Considering the findings of the report, it is the reasoned opinion of the specialist that the project can be authorised.

10 References

Department of Energy (DoE). (2008). National Energy Act (No. 34 of 2008). Republic of South Africa.

Department of Energy (DoE). (2011). National Integrated Resource Plan for Electricity 2010-2030. Republic of South Africa.

Department of Energy (DoE). (2003). White Paper on Renewable Energy. Republic of South Africa.

Department of Environmental Affairs (DEA). (1998). National Environmental Management Act 107 of 1998 (No. 107 of 1998). Republic of South Africa.

Department of Environmental Affairs (DEA). (2010). National Climate Change Response Green Paper. Republic of South Africa.

Department of Justice (DoJ). (1996). The Constitution of the Republic of South Africa (Act 108 of 1996). ISBN 978-0-621-39063-6. Republic of South Africa.

Department of Developmentrals and Energy (DME). (1998). White Paper on Energy Policy of the Republic of South Africa. Republic of South Africa.

Interorganizational Committee on Principles and Guidelines for Socio-economic Impact Assessment. US Principles and Guidelines – Principals and guidelines for socio-economic impact assessment in the USA. Impact Assessment and Project Appraisal, 21(3): 231-250.

National Development Agency (NDA). (2014). Beyond 10 years of unlocking potential. Available from: http://www.nda.org.za/?option=3&id=1&com_id=198 &parent_id= 186&com_task=1

National Planning Commission. (2012). National Development Plan 2030. ISBN: 978-0-621-41180-5. Republic of South Africa.

Statistics South Africa. (2022). Census 2022 Community Profiles Database. Pretoria.

United Nations Environment Programme (UNEP). (2002). EIA Training Resource Manual. 2nd Ed. UNEP.

United Nations Economic and Socio-economic Commission for ASEIA and the Pacific (UN). (2001). Guidelines for Stakeholders: Participation in Strategic Environmental Management. New York, NY: United Nations.

Vanclay, F. (2003). Conceptual and methodological advances in Socio-economic Impact Assessment. In Vanclay, F. & Becker, H.A. 2003. The International Handbook for Socio-economic Impact Assessment. Cheltenham: Edward Elgar Publishing Limited.

Appendix A: Survey Templates

Appendix B: CVs and Qualification Certificates