forestry, fisheries
& the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

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SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

REPORT TITLE

Social Impact Assessment for the Proposed Construction of new system 1 at Rand Water Vereeniging treatment works, installation of approximately 7 km phase 2 sludge pipeline in Vereeniging, 1.5 km sludge line in Panfontein and associated infrastructure within the jurisdiction of Sedibeng District Municipality, Gauteng Province

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with '*the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020)*', where applicable.

1. SPECIALIST INFORMATION

Title of Specialist Assessment	Social Impact Assessment (SIA)
Specialist Company Name	KMG Environmental Solutions Services
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Specialist Identity Number	9004126183081
Specialist Qualifications:	Bsc Environmental Sciences
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2. DECLARATION BY THE SPECIALIST

I, **Khumbelo Given Marabe** declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing –
    - any decision to be taken with respect to the application by the competent authority; and;
    - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of section 24F of the NEMA Act.

Signature of the Specialist

KMG Environmental Solutions Services

Name of Company:

03 Jul 2025

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _ **Khumbelo Given Marabe** _____, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

KMG Environmental Solutions Services

Name of Company

03 July 2025

Date

Click or tap here to enter text.

Signature of the Commissioner of Oaths

Click or tap to enter a date.

Date

SOUTH AFRICAN POLICE SERVICE
CRYSTAL PARK
2025 -07- 03
CLIENT SERVICES
SUID-AFRIKAANSE POLISIEDIENS

SOCIAL IMPACT ASSESSMENT REPORT

Social Impact Assessment for the Proposed Construction and Maintenance of New System 1 at Rand Water Vereeniging Treatment Works, installation of approximately 7 km phase 2 sludge pipeline in Vereeniging, 1.5 km sludge line in Panfontein and associated infrastructure within the jurisdiction of Sedibeng District Municipality, Gauteng Province.

PROJECT REFERENCE NUMBER: RW/SCP/ENV/AIA/2025/001

PREPARED FOR:

Selahle Consultancy and Projects (Pty) Ltd

(Independent Environmental Assessment Practitioners on behalf of Rand Water)

DATE OF SUBMISSION:
April 2025

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LEAD SPECIALIST: Khumbelo Given Marabe
Director and Principal Environmental Consultant
SACNASP NO: 132731
WISA REG NO :39885
IAIAsa: Membership no: 7837

SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF NEW SYSTEM 1 AT RAND WATER VEREENIGING TREATMENT WORKS, INSTALLATION OF APPROXIMATELY 7 KM PHASE 2 SLUDGE PIPELINE IN VEREENIGING, 1.5 KM SLUDGE LINE IN PANFONTEIN AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF SEDIBENG DISTRICT MUNICIPALITY, GAUTENG PROVINCE.

Prepared by:

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On Behalf of

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Reference Number: RW/SCP/ENV/AIA/2025/001

Date of Report	05 May 2025		
Report Status	Final Draft		
Prepared by	**Khumbelo Given Marabe** SACNASP NO: 132731 WISA REG NO :39885 IAIAsa : Membership no: 7837 IIAV Member No. 3163	Signature	Date 05 May 2025
Reviewed and Final Approved by	**Tshiamo Setsipane** SACNASP- 114882		

INDEMNITY

This report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken. The findings, results, observations, conclusions and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information at the time of study. Therefore, the author reserves the right to modify aspects of the report including the recommendations if and

when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

Although the author exercises due care and diligence in rendering services and preparing documents, he accepts no liability, and the client, by receiving this document, indemnifies the author against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by the author and by the use of this document.

SPECIALISTS DECLARATION

I, **Khumbelo Given Marabe** declare that:

- I act as the independent specialist in this application.
- I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP).
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant.
- I declare that there are no circumstances that may compromise my objectivity in performing such work.
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity.
- I will comply with the Act, Regulations and all other applicable legislation.
- I have no, and will not engage in, conflicting interests in the undertaking of the activity.
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan, or document to be prepared by myself for submission to the competent authority.
- All the particulars furnished by me in this form are true and correct; and
- I am aware that it is an offence in terms of Regulation 48 to provide incorrect or misleading information and that a person convicted of such an offence is liable to the penalties as contemplated in section 49B(2) of the National Environmental Management Act, 1998 (Act 107 of 1998).
- I realize that a false declaration is an offence in terms of Regulation 71 of NEMA and is punishable in terms of section 24F of the Act.

Signature

Khumbelo Given Marabe
SACNASP NO: 132731
WISA REG NO :39885
IAIAsa: Membership no: 7837
IIAV Member No. 3163

SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF NEW SYSTEM 1 AT RAND WATER VEREENIGING TREATMENT WORKS, INSTALLATION OF APPROXIMATELY 7 KM PHASE 2 SLUDGE PIPELINE IN VEREENIGING, 1.5 KM SLUDGE LINE IN PANFONTEIN AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF SEDIBENG DISTRICT MUNICIPALITY, GAUTENG PROVINCE.

EXECUTIVE SUMMARY

This Social Impact Assessment (SIA) has been prepared as part of the Basic Assessment process for the proposed construction of New System 1 at Rand Water Vereeniging Treatment Works, installation of approximately 7 km phase 2 sludge pipeline in Vereeniging, 1.5 km sludge line in Panfontein and associated infrastructure within the jurisdiction of Sedibeng District Municipality, Gauteng Province. The assessment was conducted by KMG Environmental Solutions Services (Pty) Ltd on behalf of Selahle Consultancy and Projects (Pty) Ltd, the appointed Environmental Assessment Practitioner (EAP).

The purpose of this SIA is to assess potential positive and negative social impacts that may arise during the construction and operational phases of the project, and to propose mitigation and enhancement measures in accordance with the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) and related regulatory frameworks.

Project Overview

The project consists of three key components:

- New System 1 (Vereeniging)

Construction and maintenance of a new 250 MLD flocculator and 225 MLD sedimentation tank;

  - Installation of the de-sludge bridge;
  - Construction of access roads;
  - Installation of a raw water pipeline;
  - Installation of a sludge pipeline;
  - Demolition of System 1 tank (90 MLD) to allow for the installation of a new automated system capable of producing 1400 MLD;
  - Construction of a Laboratory and
  - The installation of a new Carbon Dioxide dosing Carbonisation Bay.

- Phase 2 Sludge Pipeline

Installation and maintenance of approximately 7 km steel sludge pipeline (1000 mm diameter, 8 mm thickness) routed from the Vereeniging Pumping Station through an industrial corridor toward the Vaal River crossing.

- Panfontein Sludge Pipeline

SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF NEW SYSTEM 1 AT RAND WATER VEREENIGING TREATMENT WORKS, INSTALLATION OF APPROXIMATELY 7 KM PHASE 2 SLUDGE PIPELINE IN VEREENIGING, 1.5 KM SLUDGE LINE IN PANFONTEIN AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF SEDIBENG DISTRICT MUNICIPALITY, GAUTENG PROVINCE.

Consist of the installation and maintenance of an interconnection new sludge pipeline with approximately 1.5km in length and 800mm in diameter.

These interventions aim to increase Rand Water's treatment capacity, improve sludge management, and support long-term water security in Gauteng.

Socio-Economic Context

The study area includes Vereeniging, a historically industrial town with a mixed urban fabric of residential, commercial, and industrial land uses. The broader Sedibeng District has relatively high service access levels (85%+ formal housing, 90%+ electricity), but is also affected by aging infrastructure, youth unemployment exceeding 45%, and periodic service delivery protests.

Rand Water's project is positioned to contribute significantly to service improvement, while also presenting temporary challenges such as construction-related disruptions.

Key Findings of the Social Impact Assessment

- The project is aligned with national and provincial infrastructure priorities, including the Gauteng Growth and Development Strategy (GGDS) and the Sedibeng IDP.
- Short-term negative impacts (e.g., traffic congestion, noise, dust, service disruptions) are mostly of low to medium significance and can be effectively managed through site-specific mitigation.
- Long-term positive impacts include:
    - ✓ Improved water reliability for Gauteng and surrounding provinces,
    - ✓ Enhanced sludge handling capacity, reducing environmental risks,
    - ✓ Boost to regional economic resilience through infrastructure investment.
- Receptors include local residents, businesses, pedestrians, public institutions, and informal traders. Special consideration is required for vulnerable groups (elderly, schoolchildren, disabled).

Impact Summary

- **Construction Phase – Positive Impacts**
    - ✓ Local employment opportunities (skilled and unskilled)

- ✓ Procurement for SMMEs
- ✓ Short-term income support

- **Construction Phase – Negative Impacts**

  - ✓ Traffic congestion and pedestrian safety risks
  - ✓ Temporary access restrictions
  - ✓ Noise, dust, and service interruptions

- **Operational Phase – Positive Impacts**

  - ✓ Long-term water treatment efficiency
  - ✓ Improved sludge management
  - ✓ Increased service reliability and resilience

- **Operational Phase – Negative Impacts**

  - ✓ Permanent change in land use at pipeline and plant sites
  - ✓ Risk of mechanical failure or unplanned infrastructure bursts

- **Cumulative Impacts**

  - ✓ Pressure on shared infrastructure corridors
  - ✓ Risk of overlap with future urban and utility projects
  - ✓ Requirement for long-term stakeholder coordination (Rand Water, SAHRA, DWS, municipalities)

Mitigation Measures

The following mitigation measures are recommended to reduce or avoid negative social impacts:

Impact	**Recommended Mitigation**
Construction disruptions	Traffic Management Plans, clear signage, and stakeholder notices
Employment expectations	Prioritize local labour and SMME procurement
Access restrictions	Maintain site-specific access for businesses, schools, and residences

Noise and dust exposure	Compliance with **SANS 10103**, use of dust suppression and sound barriers
Utility service interference	Pre-construction utility mapping and coordination with service providers

Recommendations

- Proceed with project implementation, subject to strict enforcement of mitigation measures.
- Appoint a Community Liaison Officer (CLO) to manage public grievances, employment registration, and local communication.
- Conduct social performance monitoring throughout the construction phase and first year of operation.
- Ensure ongoing coordination with Emfuleni LM, Midvaal LM, Sedibeng DM, DWS, and SAHRA to align activities with legal and planning frameworks.
- Review and update mitigation plans annually, adjusting for evolving stakeholder concerns and site-specific developments.

Conclusion

The proposed Rand Water infrastructure upgrade is expected to yield substantial long-term socio-economic benefits that significantly outweigh the short-term disruptions anticipated during the construction phase. While temporary impacts—such as noise, dust, access restrictions, and traffic congestion—are inevitable in any project of this scale, they are manageable through targeted mitigation and proactive stakeholder engagement.

In the long term, the project will contribute to enhanced water treatment efficiency, improved regional water reliability, and a reduction in environmental risks associated with outdated sludge handling systems. These improvements will benefit households, industries, businesses, and public institutions across the Gauteng region and beyond, securing the resilience of a critical utility under increasing urban and environmental pressure.

Moreover, by embracing transparent communication, employing a Community Liaison Officer, and incorporating local labour and procurement strategies, the project provides an opportunity to uplift communities, build local capacity, and create a sense of shared ownership in infrastructure

development. Through fair, inclusive, and responsive implementation, the project can foster public trust, strengthen relationships between state institutions and the public, and serve as a model for socially responsible infrastructure planning in South Africa.

Ultimately, the Rand Water System 1 and sludge pipeline upgrade is not only a technical investment in bulk water supply but also a social investment in Gauteng's future, helping to promote inclusive growth, infrastructure equity, and long-term developmental sustainability.

ACRONYMS

Acronym	Full Description
BA	Basic Assessment
CLO	Community Liaison Officer
COGTA	Cooperative Governance and Traditional Affairs
CS	Community Survey
CSI	Corporate Social Investment
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
EMP	Environmental Management Plan
GHS	General Household Survey
GIS	Geographic Information Systems
GPG	Gauteng Provincial Government
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
LM	Local Municipality
MLD	Megalitres per Day
MR	Mining Right
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEMWA	National Environmental Management: Waste Act (Act No. 59 of 2008)
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NWA	National Water Act (Act No. 36 of 1998)
PPP	Public Participation Process
RoW	Right of Way
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards

SDF	Spatial Development Framework
SIA	Social Impact Assessment
Stats SA	Statistics South Africa
WULA	Water Use License Application

DEFINITIONS

Term	**Definition**
Alignment Corridor	The designated path or zone along which infrastructure such as pipelines or roads is constructed. It often includes servitude areas and buffer zones.
Baseline Conditions	The existing environmental, social, and economic conditions in the area prior to the implementation of a project, used for comparison and impact evaluation.
Capacity Building	The process of developing or strengthening skills, abilities, and resources in communities or institutions to manage impacts and benefit from development.
Construction Phase	The period in which physical project activities take place, often associated with temporary impacts such as noise, dust, road congestion, and employment opportunities.
Cultural Heritage	Tangible and intangible aspects of cultural significance, including historical buildings, gravesites, archaeological sites, and oral traditions protected under NHRA.
Decanting	The process of redirecting or temporarily suspending services (e.g., water, road access) during construction to allow for new infrastructure installation or upgrades.
Displacement (Physical or Economic)	Loss of land, assets, or access to income-generating activities as a result of project development, whether temporary or permanent.
Environmental Screening	A preliminary process to determine whether a project requires a Basic Assessment or a more detailed Scoping and EIA process under NEMA.

Equity and Inclusion	The practice of ensuring all groups, especially vulnerable populations (women, youth, the elderly, the disabled), are meaningfully involved and benefit from the project.
Health and Safety Risk	Potential harm or hazard to workers or communities arising from exposure to physical, chemical, or structural risks during construction or operation.
Livelihoods	The means through which individuals or households earn a living—may include formal employment, informal trade, subsistence farming, or service provision.
Local Economic Development (LED)	A process by which local governments, businesses, and communities work together to stimulate job creation and economic growth in the local area.
Monitoring and Evaluation (M&E)	A system of continuous assessment and review used to ensure that mitigation and enhancement measures are implemented effectively and adapted as needed.
No-Go Alternative	A scenario in which the project does not proceed, allowing for an analysis of the impacts that would not occur if the proposed development were not implemented.
Public Amenities	Infrastructure and services that support public welfare, such as parks, clinics, roads, water lines, and sanitation facilities, which may be affected by or enhanced through a project.
Resettlement Action Plan (RAP)	A plan developed when project-affected persons must be relocated physically or economically, ensuring fair compensation and restoration of livelihoods.
Right of Way (RoW)	The legal right to construct, operate, and maintain infrastructure (e.g., pipelines) through land not owned by the project proponent.
Scoping	A phase in the EIA process used to identify key issues and determine the level of detail needed in subsequent studies.
Sensitive Receptors	Specific population groups or institutions (e.g., schools, hospitals, churches) more vulnerable to negative impacts such as noise, traffic, or dust.

Service Interruption	Temporary disruption to basic services (water, electricity, sanitation, roads) caused by construction activities or relocations.
Social Licence to Operate	Ongoing community approval and acceptance of a project, often built through trust, transparency, and benefit-sharing.
Stakeholder Mapping	The process of identifying and categorizing stakeholders according to their level of interest, influence, and impact related to the project.
Sustainability	The principle of meeting current development needs without compromising the ability of future generations to meet their own needs—applies socially, economically, and environmentally.
Traffic Impact	The effect of increased construction-related or operational vehicle movement on local road networks, including congestion, safety risks, and delays.
Vulnerable Groups	Individuals or communities more likely to be disproportionately affected by negative impacts due to socio-economic status, gender, age, disability, or other factors.
Water Use License (WUL)	A formal authorization issued by DWS under the NWA, granting permission to engage in water uses such as abstraction, discharge, or pipeline installation near watercourses.

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1. INTRODUCTION

1.1. Background

Rand Water has initiated the proposed construction and maintenance of New System 1 in Vereeniging, along with the installation of associated sludge pipelines for Phase 2 and Panfontein, as part of its broader infrastructure upgrade and water quality enhancement strategy. The project is located within the Sedibeng District Municipality, Gauteng Province, and forms a critical component of the regional water treatment, sludge handling, and distribution network aimed at ensuring long-term sustainability, environmental compliance, and service reliability.

In accordance with the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), a Basic Assessment (BA) process is required to identify, evaluate, and mitigate the potential environmental and socio-economic impacts of the proposed activities. Furthermore, the project involves watercourse crossings and infrastructure associated with water abstraction and discharge, thereby triggering the need for a Water Use License Application (WULA) under the National Water Act (NWA), 1998 (Act No. 36 of 1998). Due to the modification or demolition of existing infrastructure structures that may hold heritage value, a permit under the National Heritage Resources Act (NHRA), 1999 (Act No. 25 of 1999) is also required.

To fulfil these legal requirements and ensure an integrated and independent environmental process, Selahle Consultancy and Projects (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) responsible for leading the BA, WULA, and heritage permitting processes. In line with best practice and statutory obligations, a Social Impact Assessment (SIA) is a key component of the Basic Assessment to ensure that potential socio-economic effects on surrounding communities, stakeholders, and service users are thoroughly considered and appropriately addressed.

To support this component, KMG Environmental Solutions Services (Pty) Ltd was appointed by Selahle Consultancy and Projects to undertake the Social Impact Assessment. KMG brings specialised expertise in environmental and social compliance, stakeholder engagement, and impact mitigation planning, particularly within the context of municipal infrastructure and complex service delivery environments. As part of the SIA process, a site visit was conducted on 9 April 2025 to verify baseline socio-economic conditions, assess surrounding land use, observe infrastructure layout, and gather qualitative field observations to support impact identification and rating.

The SIA focuses on understanding the social environment within the broader Sedibeng District and specifically in the project-affected areas of Vereeniging, which include both urban-industrial corridors and adjacent residential zones. The study aims to:

- Identify key socio-economic characteristics and trends of the area.
- Assess potential social impacts during construction, operation, and decommissioning phases.
- Provide practical and legally aligned mitigation and enhancement measures.
- Inform stakeholder engagement processes, ensuring that Interested and Affected Parties (I&APs) have a meaningful opportunity to participate in decision-making.

This SIA therefore forms an essential part of the environmental authorisation application process and contributes to ensuring that the project aligns with principles of sustainable development, equitable resource use, and community wellbeing, as articulated in the NEMA, NWA, NHRA, and applicable provincial and municipal policy frameworks.

1.2. Purpose of the Social Impact Assessment (SIA)

The Social Impact Assessment (SIA) is an integral component of the Basic Assessment process and serves a vital function in ensuring that the proposed development is both socially responsible and aligned with the principles of sustainable development. The primary purpose of the SIA is to identify, evaluate, and propose management measures for the potential social impacts that may arise as a result of the construction and operation of Rand Water's new system 1 and associated infrastructure, installation of approximately 7km phase 2 sludge pipeline in Vereeniging and 1.5km sludgeline in Panfontein.

The SIA is conducted in accordance with the requirements of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) and related regulations, which mandate the consideration of social, cultural, and economic impacts as part of any environmental assessment. This includes both direct and indirect effects on individuals, communities, institutions, and the broader socio-economic environment.

Specifically, the objectives of the SIA include:

- To ensure that people's needs, rights, and values are placed at the centre of the environmental management process, in accordance with Section 2 of NEMA, which

emphasizes that environmental management must serve people's physical, psychological, cultural, and social interests equitably.

- To provide a comprehensive understanding of the existing social environment of the project area, including demographic profiles, settlement patterns, service access, employment conditions, and socio-economic vulnerabilities.
- To assess both the beneficial and adverse social impacts of the proposed project during its planning, construction, operation, and decommissioning phases. These impacts may include employment creation, economic stimulation, disruption to services, changes in land use, and effects on surrounding communities' quality of life.
- To facilitate inclusive stakeholder participation by identifying Interested and Affected Parties (I&APs) and providing them with meaningful opportunities to express their views, concerns, and expectations in relation to the project.
- To identify vulnerable and historically disadvantaged groups that may be disproportionately affected by the project and ensure that their needs and interests are addressed in the planning and implementation processes.
- To recommend practical and context-specific mitigation and enhancement measures, aimed at avoiding, reducing, or offsetting negative impacts, while enhancing potential benefits associated with infrastructure investment and service delivery improvements.
- To inform environmental decision-making processes by regulatory authorities, including the Department of Forestry, Fisheries and the Environment (DFFE), the Department of Water and Sanitation (DWS), and the South African Heritage Resources Agency (SAHRA), ensuring compliance with the legal framework.
- To promote transparency, accountability, and social sustainability, by providing a structured process through which socio-economic risks can be proactively managed, and long-term development benefits can be maximized.

In summary, the SIA supports responsible project implementation by ensuring that the voices of affected communities are heard, socio-economic conditions are not worsened, and the project contributes meaningfully to local development and institutional goals outlined in the Sedibeng District Integrated Development Plan (IDP), Spatial Development Framework (SDF), and Rand Water's service delivery mandate.

1.3. Approach to the Study

The approach adopted for this Social Impact Assessment is primarily desktop-based and secondary data-driven, with reference to authoritative sources such as Statistics South Africa (Stats SA), Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs), and site-specific environmental data. The following steps were taken to conduct the SIA:

- Review of the project scope and engineering layout plans.
- Identification of potential social receptors and key stakeholder groups.
- Collection and interpretation of demographic, economic, and service delivery indicators.
- Preliminary mapping of sensitive areas, population clusters, and service infrastructure.
- Alignment with applicable legal and planning frameworks.
- Impact prediction, rating, and the development of mitigation/enhancement measures

Table 1: Summary of Methodological Steps for the Social Impact Assessment

Step	Description	Purpose
1. Project Understanding	Review of the project scope, infrastructure layout, and activities as described in the Basic Assessment Report, engineering drawings, and scope of works.	To understand the nature, scale, and timing of the proposed development.
2. Definition of the Study Area	Identification of geographic boundaries for the social assessment, including surrounding communities, land use zones, service areas, and receptor zones.	To spatially define the population and social assets potentially affected by the project.
3. Legislative and Policy Review	Examination of applicable legislation (NEMA, NWA, NHRA), municipal IDPs, SDFs, and provincial development strategies.	To ensure legal compliance and alignment with regional development goals.
4. Socio-Economic Baseline Profiling	Compilation and analysis of existing demographic, economic, housing, and service delivery data from sources like Stats SA, municipal reports, and GHS.	To establish pre-project conditions and provide a benchmark for impact prediction.
5. Stakeholder Identification	Mapping of Interested and Affected Parties (I&APs), vulnerable groups, service providers, and public institutions.	To recognize key social receptors and guide public engagement efforts.

6. Impact Identification and Screening	Preliminary identification of potential positive and negative social impacts across all project phases (construction, operation, decommissioning).	To focus the assessment on key issues requiring further analysis.
7. Impact Assessment and Rating	Application of a standardized rating methodology assessing the nature, extent, duration, intensity, and significance of social impacts.	To evaluate the significance of each impact and inform mitigation planning.
8. Development of Mitigation and Enhancement Measures	Formulation of site-specific measures to avoid, reduce, or offset negative impacts and enhance project benefits.	To improve social outcomes and contribute to sustainable development.
9. Integration with Environmental Process	Alignment of SIA results with the Basic Assessment Report, Environmental Management Programme (EMPr), and Public Participation Process (PPP).	To ensure the SIA informs decision-making and licensing processes.
10. Compilation of the SIA Report	Preparation of a detailed report with maps, tables, stakeholder issues, and recommendations.	To present findings in a format acceptable to authorities (DFFE, DWS, SAHRA).

1.4 Key Components of the Social Impact Assessment (SIA)

As outlined in the *Guidelines for Involving Social Assessment Specialists in EIA Processes* (DEADP, 2007), the Social Impact Assessment (SIA) provides a structured and methodologically sound approach to evaluating the consequences of development on communities and stakeholders. These components ensure that potential risks and benefits are fully explored and integrated into the project's decision-making and management processes.

1.4.1 Description of the Proposed Development and Affected Communities

This involves clearly outlining the nature, scope, location, and timelines of the Rand Water

infrastructure project. It also includes a description of surrounding communities that may be impacted directly or indirectly. This contextual framing allows for an accurate identification of potential social receptors, including residents, service users, businesses, institutions, and municipal systems.

1.4.2 Collection of Baseline Socio-Economic Data

Baseline data collection involves the use of secondary data sources (e.g., Stats SA, IDPs, GHS, SDFs, previous environmental reports) to understand the demographic, social, economic, and service access profile of the study area. Indicators include:

- Population size and composition
- Education and employment
- Housing conditions
- Access to services (water, electricity, sanitation)
- Community health and safety

This data provides the reference condition against which project impacts can be predicted and monitored.

1.4.3 Identification and Analysis of Alternatives

The SIA evaluates different project implementation scenarios, including:

- Route alignment alternatives for the pipelines (to avoid sensitive areas)
- Design and infrastructure placement alternatives
- The No-Go alternative, representing the scenario where the project does not proceed

This analysis supports transparent and rational decision-making by weighing the social implications of each option.

1.4.4 Assessment of Direct and Indirect Social Impacts

This involves identifying and rating social impacts expected during the construction, operational, and decommissioning phases. Impacts assessed include:

- Positive impacts such as job creation, infrastructure upgrades, and service reliability

- Negative impacts such as displacement of access, traffic disruptions, noise, dust, health risks, and impacts on vulnerable groups

Both site-specific (local) and area-wide (regional) social impacts are considered.

1.4.5 Development of Mitigation and Enhancement Measures

Practical and legally compliant mitigation measures are proposed to:

- Reduce or eliminate negative impacts
- Enhance project benefits (e.g., local procurement, community training)
- Protect vulnerable receptors (e.g., schools, informal traders)

Measures are aligned with the Environmental Management Programme (EMPr) and project-specific Environmental Authorisation conditions.

1.4.6 Monitoring and Evaluation Framework

A clear framework is designed for:

- Tracking social performance indicators
- Ensuring compliance with mitigation commitments
- Providing feedback loops to stakeholders and authorities (e.g., DWS, DFFE)

This may include:

- Periodic community satisfaction surveys
- Grievance mechanisms and reporting structures
- Social compliance checklists for contractors

Table 2 Summary of SIA Components and Their Purpose

SIA Component	Purpose
Description of the Project & Area	To understand the context, scale, and receptors likely to be impacted

Baseline Socio-Economic Profiling	To establish a reference condition for assessing change
Alternatives Analysis	To support sustainable decision-making through comparison
Impact Identification & Rating	To evaluate the scale, duration, and significance of expected social changes
Mitigation & Enhancement Measures	To reduce harm and maximize social benefits
Monitoring & Evaluation	To ensure ongoing accountability, adaptive management, and community engagement

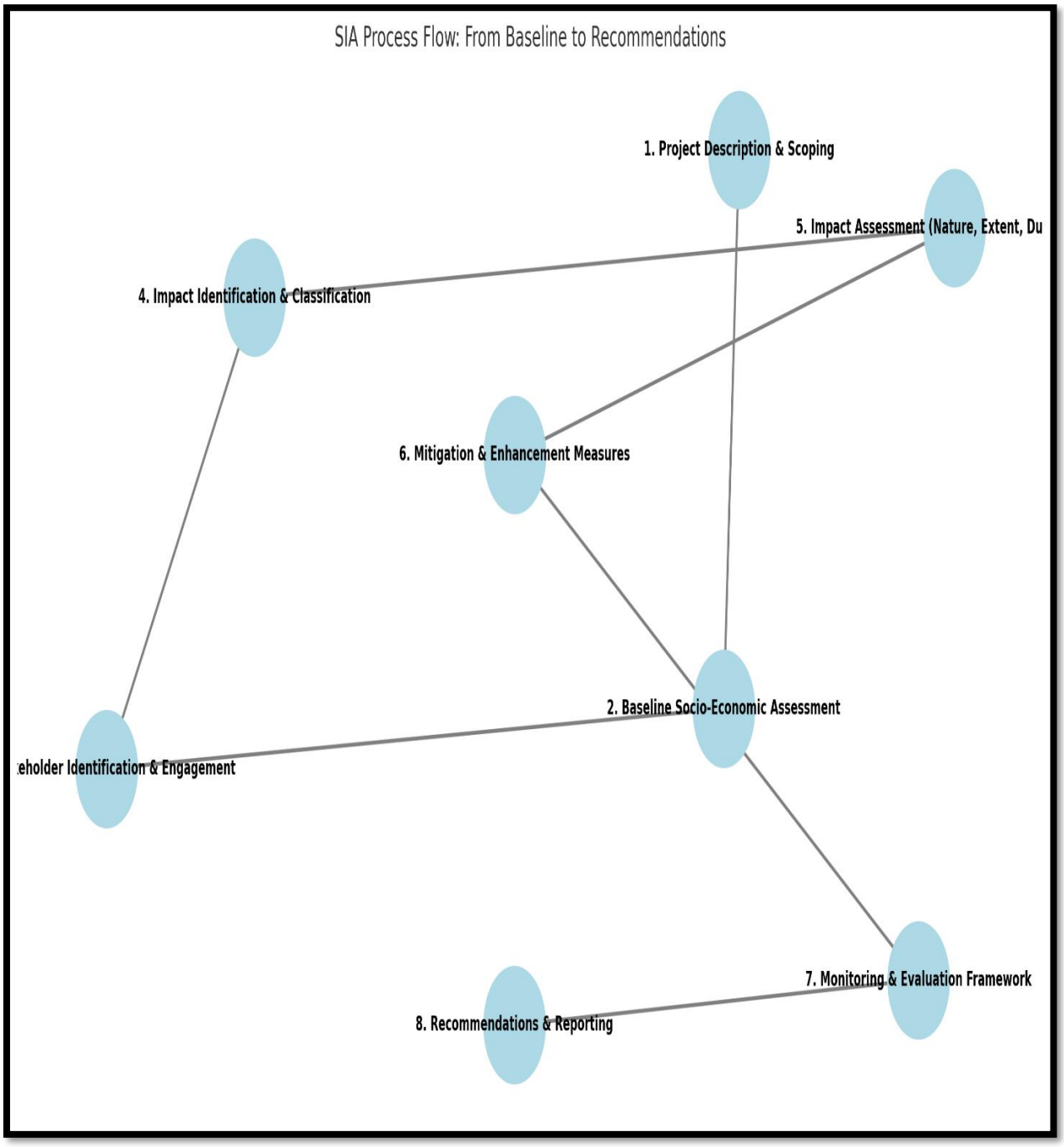


Figure 1: SIA Process Flow – from Baseline to Recommendations

2. PROJECT DESCRIPTION

2.1. Location

The proposed development is situated within the Sedibeng District Municipality in the Gauteng Province, South Africa, and falls primarily within the jurisdiction of the Emfuleni and Midvaal Local Municipality, specifically the Vereeniging urban-industrial node. Vereeniging forms part of the Vaal Triangle region and plays a central role in regional water infrastructure, energy distribution, and manufacturing.

The project area is well-established, with existing road infrastructure, stormwater systems, water and sewer networks, electricity supply, and communication lines. The route traverses a combination of public infrastructure corridors, industrial zones, and Rand Water's existing operational servitudes. As such, the location presents both opportunities and sensitivities regarding land use compatibility, stakeholder coordination, and community impacts.

The key operational sites and pipeline corridors are located in or near:

- Vereeniging Water Treatment Works, where major infrastructure upgrades will take place.
- South of Vereeniging CBD, where the sludge pipeline (Phase 2) passes through an established industrial area.
- Panfontein Water Treatment Residue site, where a sludge pipeline interconnection will be established to integrate with existing infrastructure.

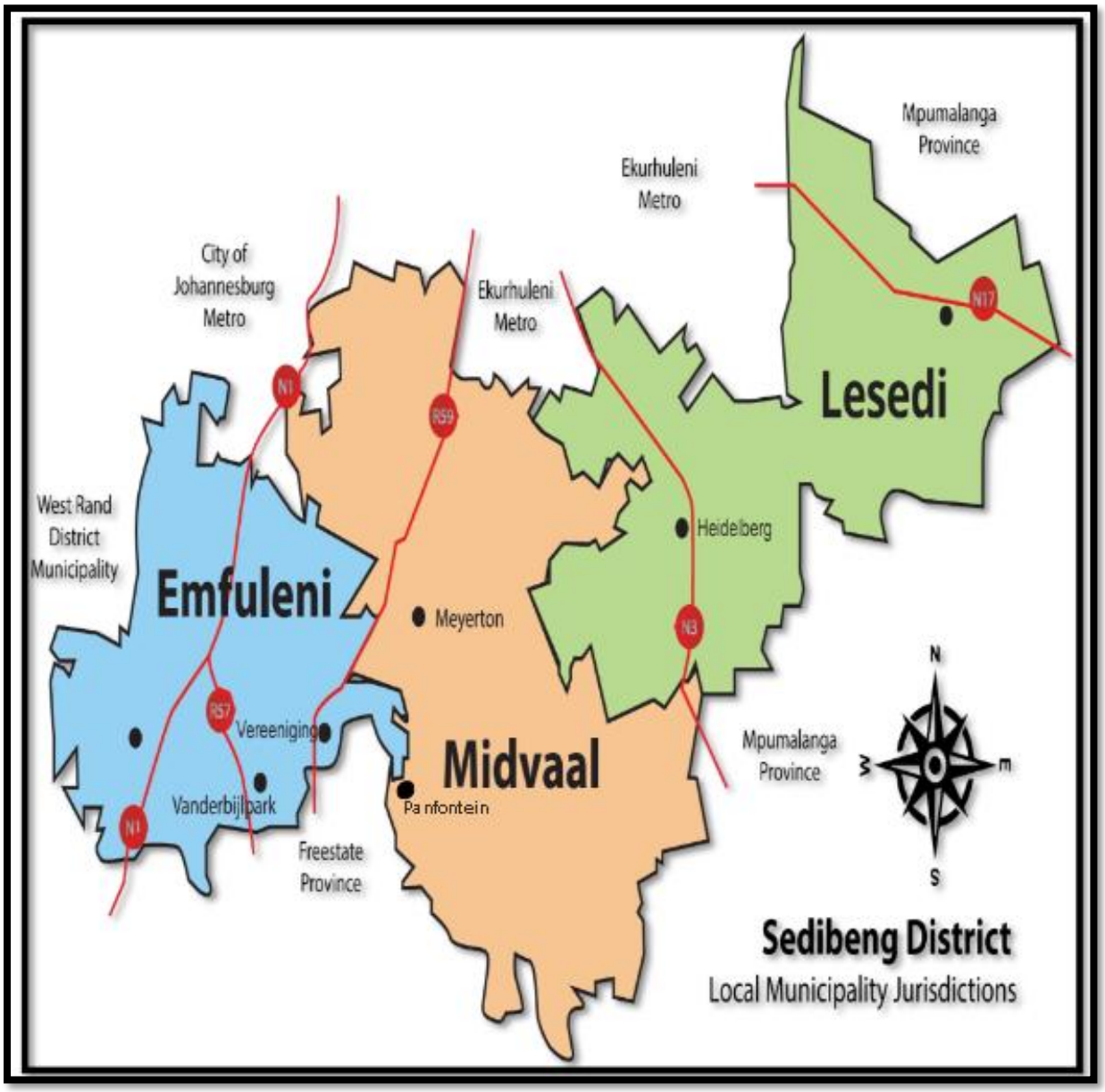


Figure 2:Regional Context Map – Sedibeng and Vereeniging Location (MAP)

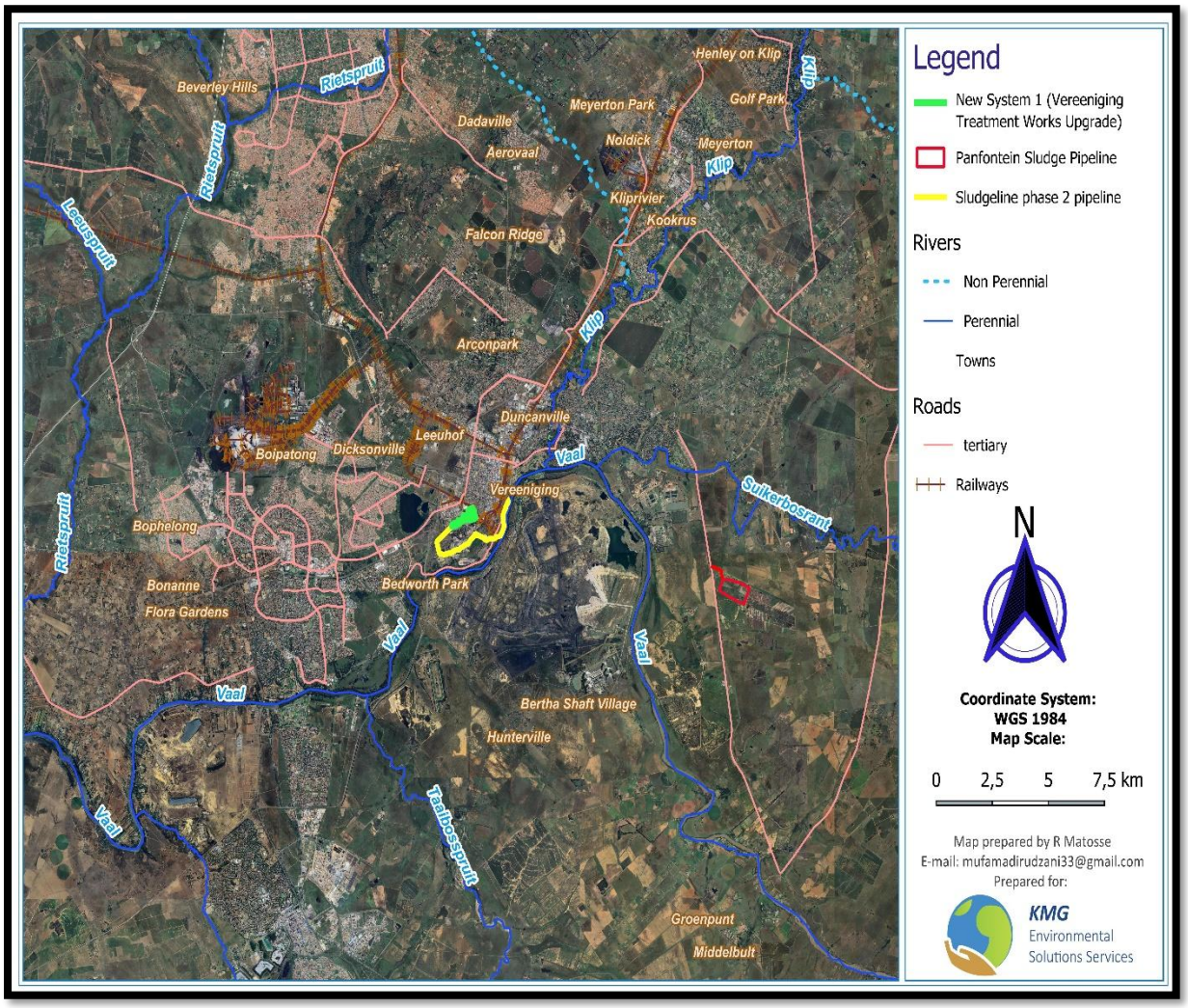


Figure 3:Project Layout Map

The study area for the New System 1 and associated infrastructure, installation of approximately 7km phase 2 sludge pipeline in Vereeniging and 1.5km sludgeline in Panfontein is primarily located within urban and Peri-urban zones, including Vereeniging, Peacehaven, and Van der Westhuizenhoogte AH, with the infrastructure situated near key residential areas such as Duncanville, Three Rivers, and Richmond. The locality is well serviced by tertiary and residential roads, as well as rail infrastructure, providing good logistical access. The pipelines and treatment facilities are positioned adjacent to major watercourses including the Vaal, Klip, and Suikerbosrand Rivers, highlighting the need for strict water resource management and compliance with environmental buffer regulations. The land capability map shows that the project footprint falls mainly within Class III land, indicating moderate suitability for development with appropriate soil conservation measures. Areas of Class VI and VIII

land occur further east and south of the project and are more environmentally sensitive, requiring avoidance or mitigation. Overall, the locality supports infrastructure development, but due to proximity to residential zones, rivers, and mixed land capability classes, the project must incorporate sound environmental safeguards, stakeholder engagement, and land-use planning.

2.2. Project Components

The proposed project involves three main infrastructure interventions designed to enhance Rand Water's water treatment and sludge handling capacity. The components are described as follows:

2.2.1 New System 1 (Vereeniging Treatment Works Upgrade)

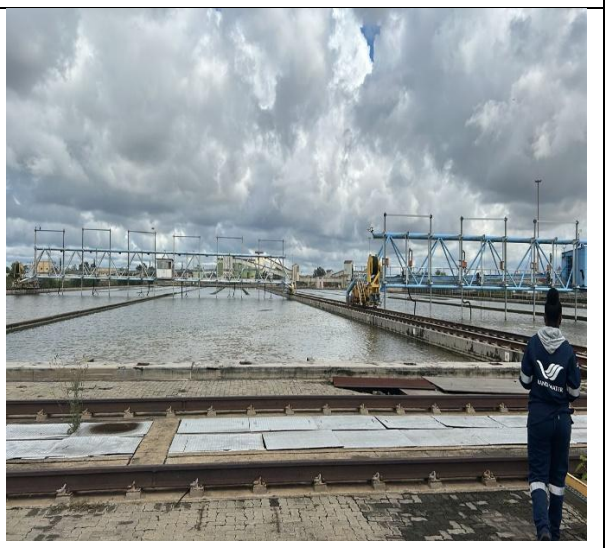
This component involves the complete redevelopment and modernisation of System 1 infrastructure at the Vereeniging Water Treatment Works. Key elements includes but are not limited to:

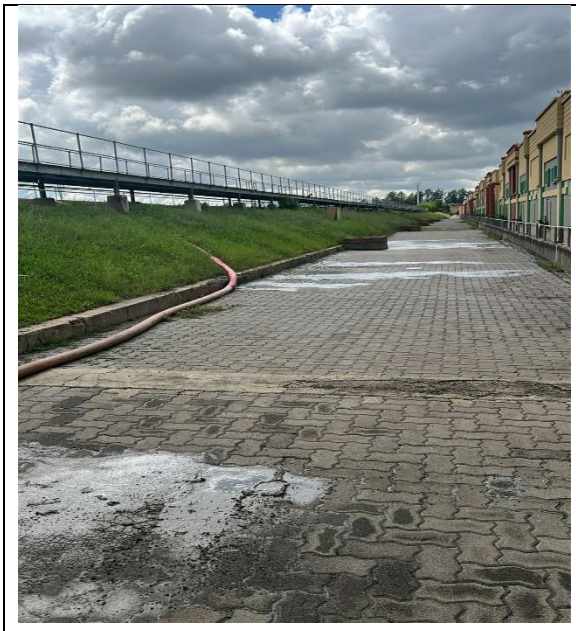
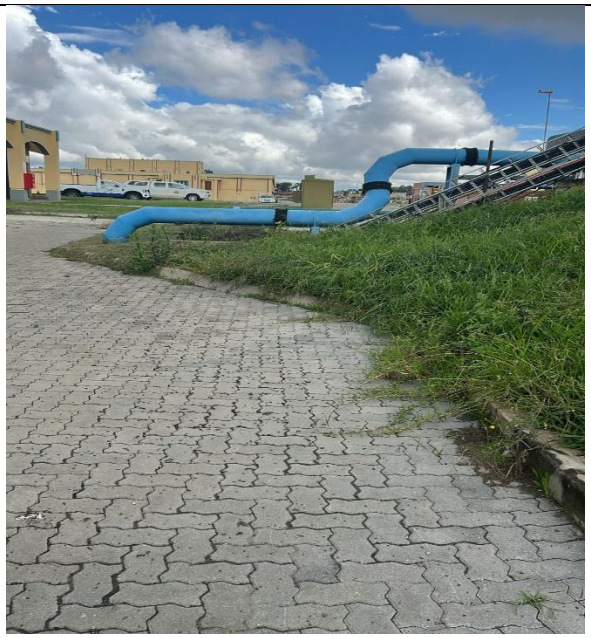
- **Construction of a 250 Megalitre per day (MLD) flocculator**: A critical facility for promoting the coagulation and sedimentation of particles during the water purification process.
- **Installation of a 225 MLD sedimentation tank**: Facilitating the settling and removal of suspended solids.
- **Demolition of the existing 90 MLD tank**: Required to make space for a new high-capacity system with automation capability.
- **Installation of a sludge de-watering bridge**: To handle increased volumes of sludge generated during treatment.
- **Construction of a laboratory**: To improve on-site water quality testing and operational diagnostics.
- **Installation of a carbon dioxide dosing bay**: Used to regulate pH levels during water treatment processes.
- **Construction of access roads and internal circulation routes**: For improved operational mobility and logistics.

This component will significantly increase Rand Water's treatment capacity and service reliability while integrating modern automation systems for efficiency.

Figure 4: New System 1 - Vereeniging Water Treatment Works

Table 3 : Existing System 1 Infrastructure

	
Rand Water's infrastructure-**Sedimentation tanks section**	Rand Water's infrastructure -**Sedimentation or settling tanks**
	
Rand Water's infrastructure **- Flocculators**	Rand Water's infrastructure **- Sedimentation tanks**

	
Rand Water's infrastructure **-Paved service corridor or drainage channel**	Rand Water's infrastructure **-Blue above-ground pipeline installation**

2.2.2 Phase 2: Sludge Pipeline

Phase 2 of the project focuses on the installation of a 7 km steel sludge pipeline and associated infrastructure, which will extend from the sludge pumping station inside Vereeniging Treatment Works to the Vaal River crossing. The pipeline is designed with the following technical specifications:

- 1000 mm nominal internal diameter
- 8 mm wall thickness
- Total length: approximately 7000 metres

The pipeline will run primarily through established industrial areas, alongside or intersecting with several existing municipal and utility services, including:

- Surfaced roads
- Sewer and water pipelines
- Gas infrastructure
- Communication lines
- Rand Water's bulk water pipelines

This route has been carefully selected to minimize service disruption and land acquisition, although temporary impacts may occur during trenching, crossing works, and reinstatement.

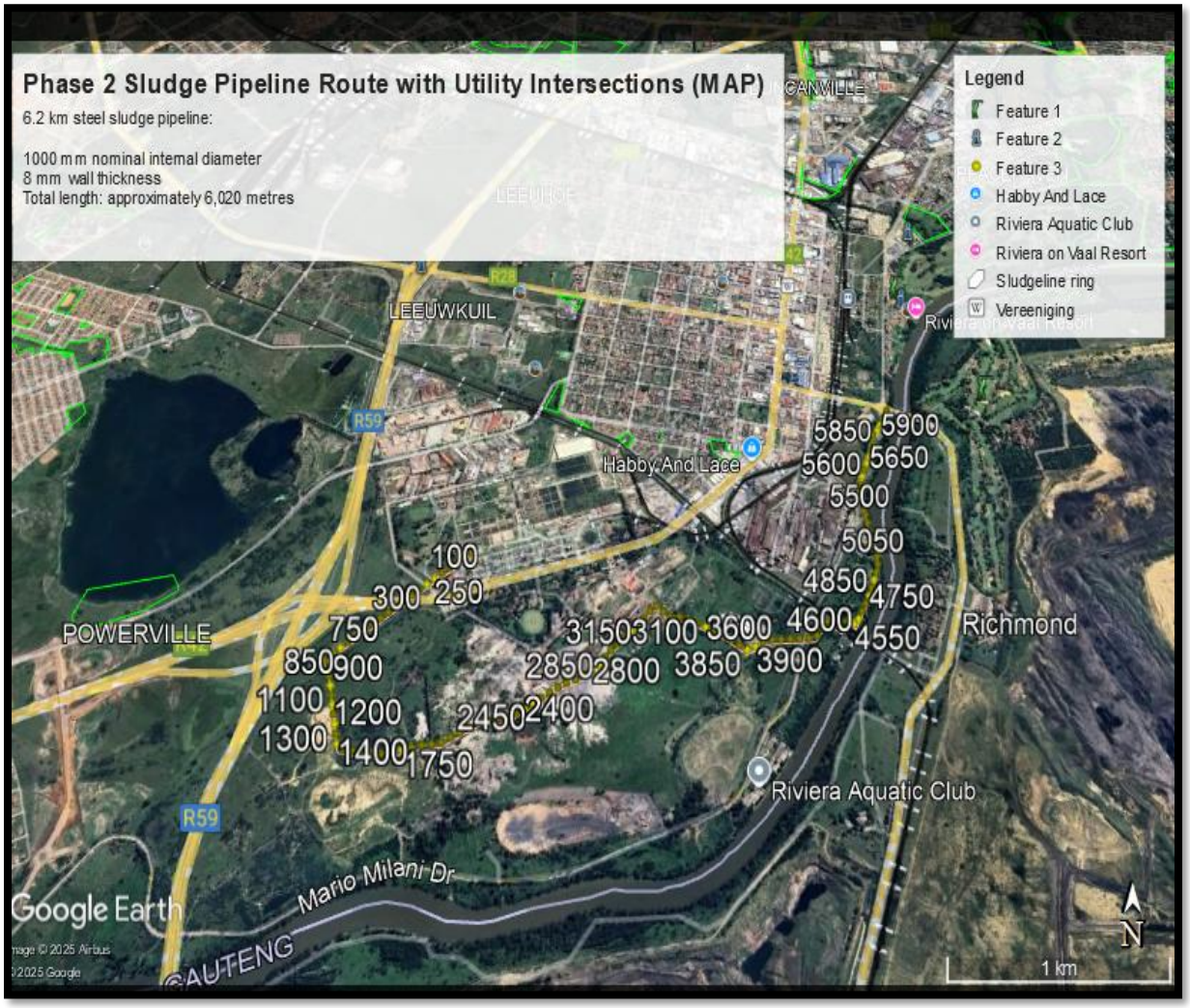


Figure 5: Approximately 7km phase 2 Sludge Pipeline Route with Utility Intersections (MAP)

Table 4 : Phase 2 Sludge Pipeline Area (Pictures)

	
Water beacon near National road and residential area, where sludge pipes will be installed	Rand Water's old VGM dam , where the sludge pipes will be installed
	
Water beacon near disturbed wetlands, where the sludge pipes will be installed	Plantation farm where the sludge pipes will pass.
	
Old fenced mine where the sludge pipes will pass	Rand Water chambers where the sludge pipes will end for phase 2

2.2.3 Panfontein Sludge Pipeline Interconnection

This component involves the construction of an interconnecting sludge pipeline of approximately:

- 1.5 kilometres in length
- 800 mm diameter steel pipe

The pipeline will serve to link existing sludge lines in Panfontein with upgraded systems in Vereeniging, facilitating improved sludge management, flow regulation, and operational control.

This section passes through service corridors and is expected to have minimal community interface, although health and safety measures during construction will still be required due to potential vehicle movement and equipment operation in shared access areas.

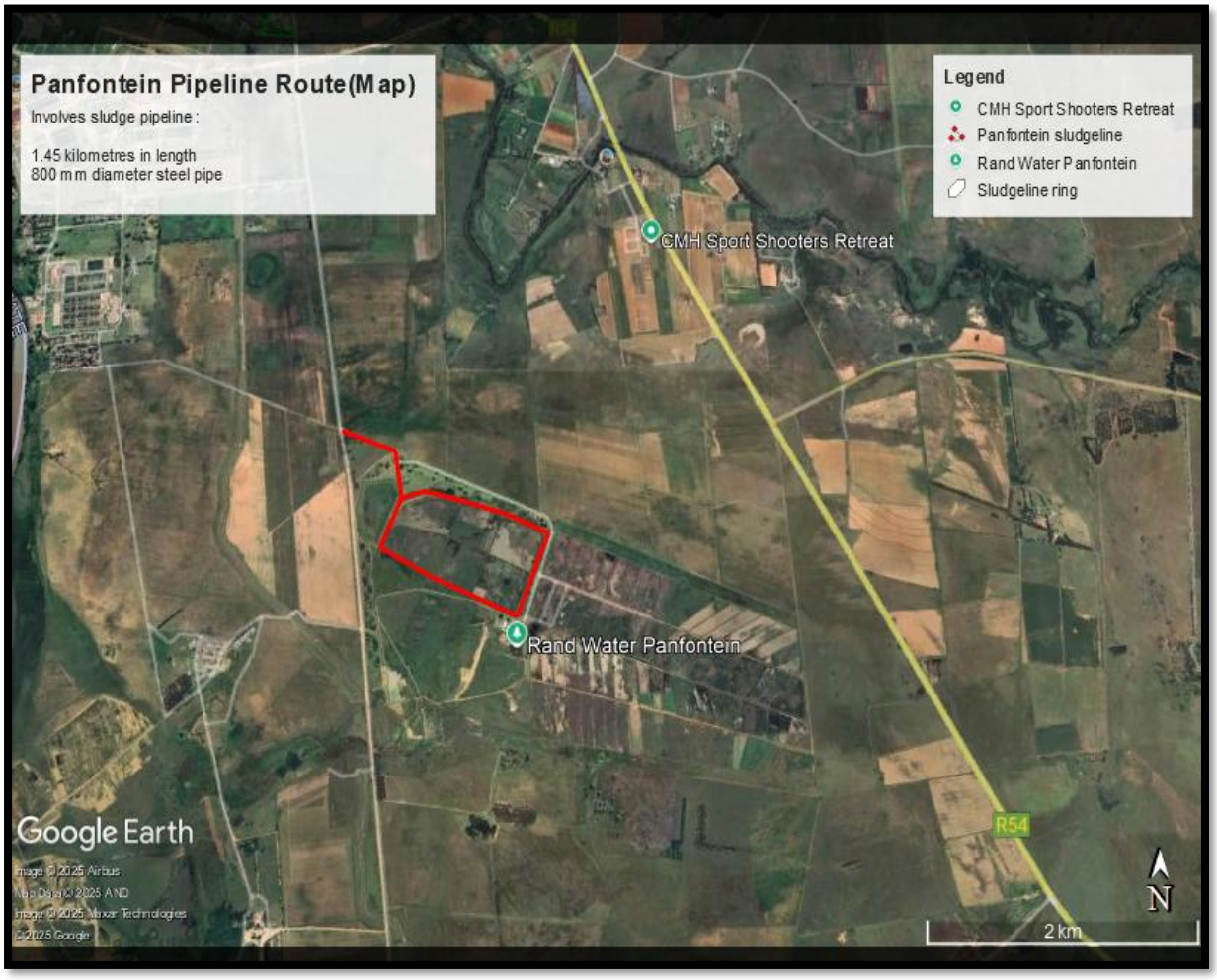


Figure 6: Panfontein Pipeline Route(Map)

*Table 5:*Panfontein Sludge Pipeline Interconnection

	
Rand water end point embankment where the pipes will be installed	Old construction site camp
	
Rand water side pan structure	Chamber housing valves and other infrastructure where the pipe connects
	
The proposed sludge pipe will pass through to the 3 water beacons	Canal with water from the sludge drying beds

Table 6: Summary of Technical Specifications – All Project Components including, but not limited to:

Project Component	Description	Specifications	Purpose / Function
New System 1 Flocculator	New high-capacity flocculation basin at Vereeniging Treatment Works	250 MLD (Megalitres per Day)	To aggregate and remove suspended solids as part of water purification
Sedimentation Tank	Large settling tank for post-flocculation sedimentation	225 MLD capacity	To allow separation and removal of solid particles
Sludge De-Sludging Bridge	Mechanical bridge for sludge collection and removal	Integrated with sedimentation tank	Enhances sludge management and reduces manual intervention
Demolition of Old System 1 Tank	Removal of outdated infrastructure	90 MLD capacity (to be replaced)	To make way for upgraded automated and larger capacity systems
Raw Water Pipeline	Pipeline feeding untreated water into the treatment system	Technical details under review	Enables continuous raw water intake for treatment
Carbon Dioxide Dosing Bay	New dosing facility for pH control and CO_2 injection	Automated dosing system	To optimize water quality through pH balance
Laboratory Facility	New on-site testing and control building	Modern lab with water quality instruments	For quality assurance and process monitoring
Access Roads & Internal Circulation	Roads to connect infrastructure and allow maintenance access	Surface treated access routes	Improves logistics, emergency access, and O&M activities

Phase 2 Sludge Pipeline	Steel pipeline from Vereeniging Treatment Works to Vaal River	Length: 6.2 km; Diameter: 1000 mm; Wall: 8 mm	Transfers treated sludge efficiently and safely
Panfontein Sludge Interconnection	Interlink pipeline between existing sludge systems	Length: 1.45 km; Diameter: 800 mm	Facilitates sludge flow integration and improves redundancy
Associated Works	Includes trenching, service crossings, fencing, and control structures	Location-specific based on corridor intersections	Ensures secure, efficient installation with minimal disruption

3. LEGISLATIVE AND POLICY FRAMEWORK

The proposed Rand Water project, which includes the construction of New System 1 and the installation of associated sludge pipelines in Vereeniging, must comply with a range of national, provincial, and municipal legislative frameworks. These laws are intended to promote sustainable development, ensure public participation, and safeguard environmental and social rights as enshrined in the Constitution of the Republic of South Africa.

The following legislative and policy instruments apply to this project:

3.1. Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)

The Constitution provides the overarching legal foundation for environmental and social rights in South Africa. In particular, Section 24 (Environmental Rights) ensures that:

- Everyone has the right to an environment that is not harmful to their health or well-being.
- The environment must be 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 sustainable development and resource use while promoting justifiable economic and social development.

This constitutional mandate forms the basis for all other environmental and social assessment laws applicable to this project.

3.2. National Environmental Management Act, 1998 (Act No. 107 of 1998) – NEMA

NEMA is the central environmental law in South Africa. It requires an environmental authorisation for listed activities that may result in significant impacts on the environment, including social and economic impacts.

This project triggers several activities listed under **Listing Notices 1 and 3 of the EIA Regulations**, thus requiring a **Basic Assessment**. Key NEMA principles relevant to this SIA include:

- Environmental management must serve people's needs equitably.
- Development must be socially, environmentally, and economically sustainable.
- Community well-being, empowerment, and informed participation must be promoted.
- Impacts on social and cultural heritage must be identified and mitigated.

Table 7: Applicable Listed Activities Triggered Under NEMA Listing Notices

Listing Notice	**Activity Number**	**Description of Activity**	**Relevance to the Project**
Listing Notice 1 (GN R.327)	**9**	The development of infrastructure exceeding 1,000 metres in length for the bulk transportation of water, sewage or storm water.	The sludge pipelines proposed under **Phase 2** and **Panfontein** exceed 1,000 m in length and are intended for bulk sludge conveyance.
	10	The development and related operation of infrastructure for the transmission and distribution of water inside a development footprint of 1 ha or more.	New infrastructure at the Vereeniging Treatment Works (System 1), including sedimentation tanks, pipelines, and dosing bays, exceeds 1 ha.

	13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	The project consist of the construction of a flocculator and sedimentation tank
	19	The infilling or depositing of any material of more than 10 m^3 into a watercourse.	Watercourse crossings may require temporary infilling during pipeline construction or bridge crossings.
	27	The development of infrastructure or structures with a physical footprint of 1 ha or more within an urban area.	The System 1 upgrade, including access roads and lab buildings, covers more than 1 ha within the urban-industrial setting of Vereeniging.
Listing Notice 3 (GN R.324)	**12**	The clearance of 300 m^2 or more of vegetation where such clearance is located in a watercourse or within 32 m of a watercourse.	Portions of the pipelines cross or run near watercourses and may require clearance of riparian vegetation.
	14	The clearance of an area of 5 hectares or more vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	The System 1 upgrade, including access roads and lab buildings, covers more than 1 ha within the urban-industrial setting of Vereeniging.

3.3. National Water Act, 1998 (Act No. 36 of 1998) – NWA

The National Water Act governs the use, management, and protection of water resources. Because the sludge pipelines cross or are located near watercourses and the project involves water abstraction,

waste discharge, and potential watercourse modification, a **Water Use License Application (WULA)** is required.

Relevant water uses under Section 21 of the Act include:

- **21(c)**: Impeding or diverting the flow of water in a watercourse.
- **21(i)**: altering the bed, banks, course or characteristics of a watercourse.

A technical water assessment and SIA findings must align to ensure that the water-related socio-economic impacts—particularly on service access, public health, and aquatic resource users—are well understood and managed.

3.4. National Heritage Resources Act, 1999 (Act No. 25 of 1999) – NHRA

The project involves the modification and demolition of existing infrastructure that may be older than 60 years, including water treatment structures. Therefore, an application for a **Heritage Permit** in terms of Section 34 and 38 of the NHRA is required.

The South African Heritage Resources Agency (SAHRA) must be notified, and where applicable, a Heritage Impact Assessment (HIA) may be conducted. This process ensures the protection of:

- Built heritage (including structures older than 60 years),
- Archaeological resources,
- Graves and burial sites.

The SIA complements this by identifying culturally significant sites and ensuring that communities are consulted if heritage concerns arise.

3.5. National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) – NEMWA

This Act regulates the generation, transport, treatment, and disposal of waste. Sludge produced during water treatment is classified as **waste** and must be managed in accordance with waste licensing and handling regulations.

Key considerations under NEMWA relevant to the project include:

- Classification of sludge type and volume.

- Storage, handling, and disposal practices during construction and operation.
- Protection of health and safety during waste transfer activities.

3.6. Gauteng Provincial Environmental Management Framework (EMF)

The Gauteng EMF provides land-use and environmental sensitivity guidelines for planning and infrastructure development. The EMF helps:

- Identify **environmentally sensitive areas**.
- Avoid land-use conflicts in **urban-industrial corridors**.
- Promote alignment between municipal development goals and provincial environmental strategies.

The SIA aligns with the EMF by supporting **spatial integration**, identifying vulnerable receptors, and reducing conflicts between water infrastructure and surrounding land uses.

3.7. Municipal By-Laws and Integrated Development Planning (IDP)

The Sedibeng District Municipality, Emfuleni and Midvaal Local Municipality enforce local development by-laws that affect construction activities, noise, waste management, and road closures.

Additionally, this project supports key IDP objectives, including:

- Upgrading of bulk infrastructure,
- Improved water and sanitation services,
- Stimulating local economic development through infrastructure investment.

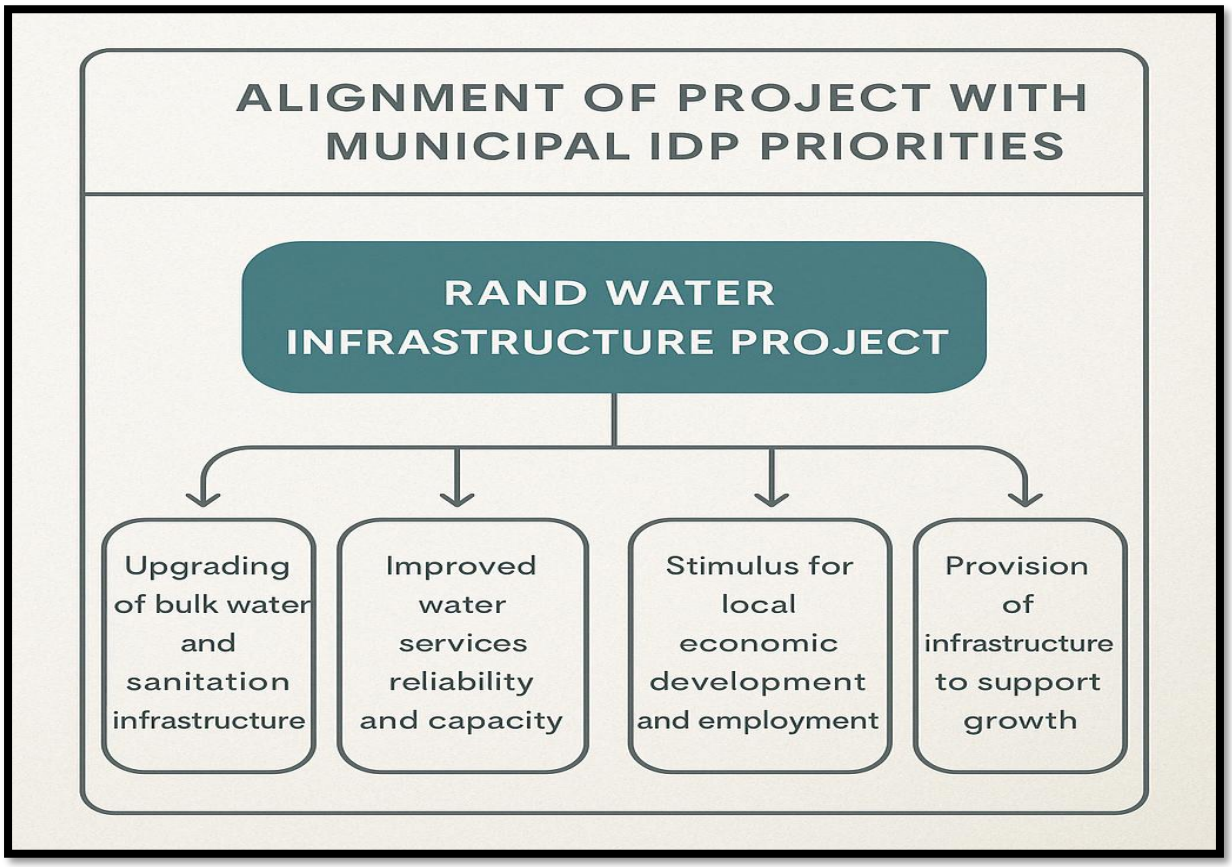


Figure 7: Alignment of Project with Municipal IDP Priorities

3.8. Other Relevant Guidelines and Standards

- **SANS 10103**: Acceptable noise levels during construction and operational activities.
- **Occupational Health and Safety Act (OHSA), 1993**: Worker protection and public safety near construction sites.
- **Construction Regulations, 2014**: Site compliance, signage, fencing, and risk management.

4. SOCIO-ECONOMIC OVERVIEW OF THE STUDY AREA

Understanding the socio-economic landscape of the affected area is essential for identifying potential receptors of impact, gauging community vulnerability, and assessing how the proposed infrastructure project may influence local livelihoods, well-being, and service access. The study area spans portions of the Sedibeng District Municipality, with a specific focus on the Vereeniging area, located within the Emfuleni Local Municipality, Gauteng Province.

4.1. Gauteng Province

Gauteng is South Africa's smallest province by land area but remains the economic and administrative powerhouse of the country. It contributes significantly to national development and is home to an estimated 15.1 million people, representing more than 25% of the total South African population (Stats SA, 2023). Major urban centres include Johannesburg, Tshwane (Pretoria), Ekurhuleni, and the Vaal Triangle region, within which the Sedibeng District Municipality is located.

Key Features of Gauteng Province Relevant to the Project

Urbanisation and Demographic Density: Gauteng is the most urbanised province in South Africa, with over 97% of its population residing in urban areas (Stats SA, 2016). This urban concentration has resulted in:

- High population densities in core metropolitan and industrial areas,
- Increasing pressure on water, sanitation, housing, and health services, and
- The proliferation of informal settlements in peripheral zones due to rapid in-migration and land scarcity.

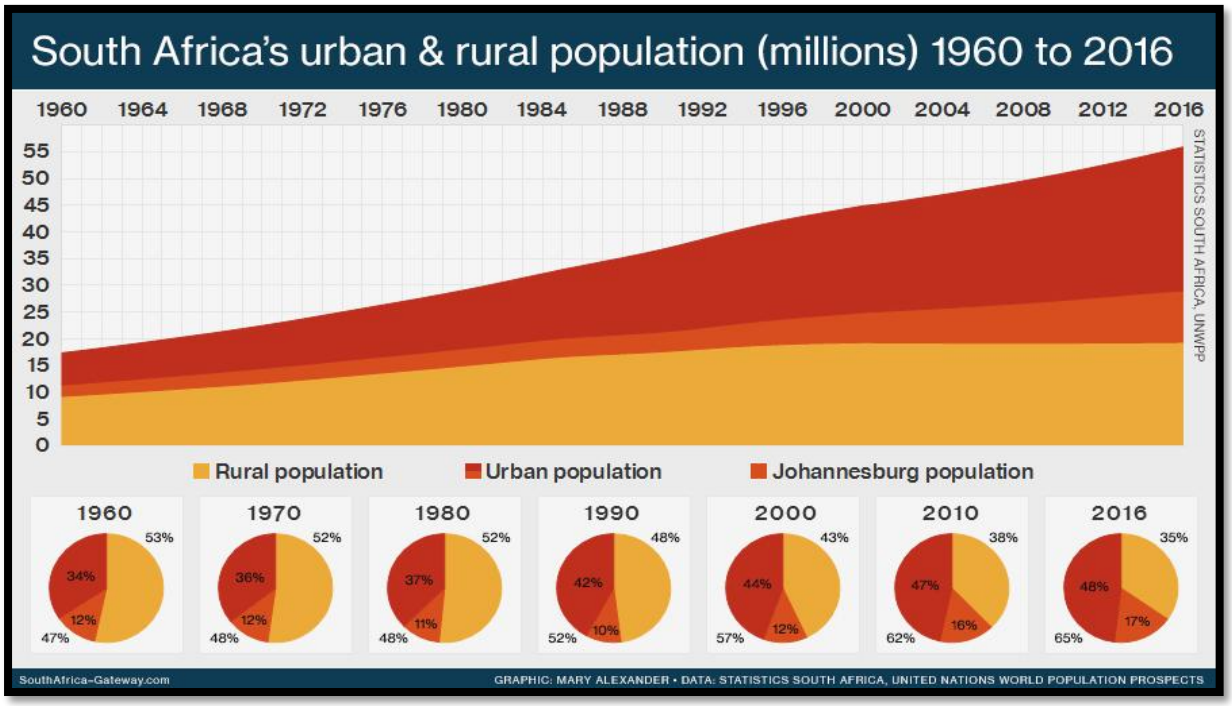


Figure 8: South African's vs Rural Population – Stats SA, 1960 to 2016

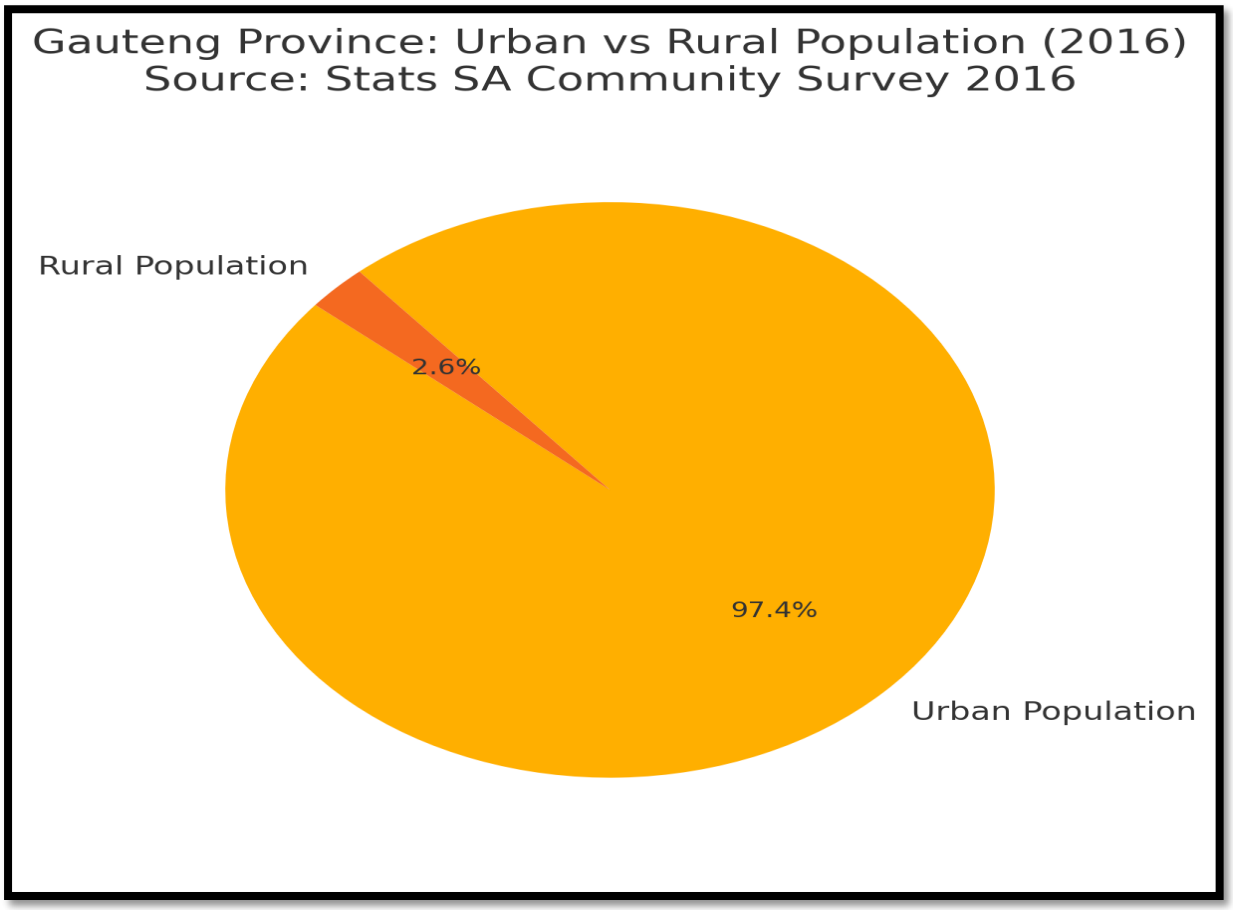


Figure 9 : Urban vs Rural Population Distribution in Gauteng Province

Economic Activity and Infrastructure: The province contributes approximately 34% to South Africa's Gross Domestic Product (GDP) (Stats SA, 2023). It functions as the national hub for finance, manufacturing, transport logistics, and public administration. Critical infrastructure networks crisscross the province, including the N1, N12, and R59 highways, rail networks, energy corridors, and Rand Water's bulk pipeline system (Rand Water, 2022).

Vereeniging, where the project is located, forms part of the Vaal Triangle industrial zone. It is strategically positioned to support bulk water treatment, sludge management, and the distribution of potable water across provincial boundaries (Rand Water & Selahle Consulting, 2025).

Social Development and Inequality: Despite Gauteng's economic status, the province is marked by significant income inequality and high unemployment, especially among youth. As of Q3 2023, the expanded unemployment rate stood at 41.3%, with youth unemployment above 50% (Stats SA, 2023). Challenges include:

- Limited access to quality services in informal settlements,
- Backlogs in infrastructure maintenance and housing delivery,
- Frequent service delivery protests in vulnerable communities.

Given this context, projects like the Rand Water infrastructure upgrade must be implemented with inclusive socio-economic benefits to ensure public support and improved community well-being (GPG, 2021).

Environmental and Water Resource Pressures: The Gauteng province faces acute environmental constraints, particularly relating to:

- Water quality deterioration in the Vaal River system,
- Pollution and nutrient loading from aging wastewater systems,
- Rapid urban development encroaching on ecological buffers, and
- High sludge volumes requiring compliant disposal or reuse systems (DWS, 2022; GDARD, 2023).

The System 1 Upgrade and sludge pipeline interventions directly address these concerns by:

- Reducing sludge overflow risks,
- Improving treatment plant efficiency, and
- Strengthening the province's capacity to meet water quality targets (Rand Water, 2022).

Alignment with Provincial Policy and Development Goals: The proposed Rand Water project is aligned with several strategic objectives outlined in the Gauteng Growth and Development Strategy (GGDS 2030) and the Gauteng Provincial Spatial Development Framework (GPSDF 2030), which promote:

- Bulk infrastructure upgrades to meet future service demand,
- Strategic economic investment in peri-urban districts,
- Reduction of infrastructure bottlenecks and service gaps, and
- Climate-smart and sustainable development (GPG, 2021).

The infrastructure renewal efforts under this project support the province's agenda for inclusive economic growth, environmental resilience, and service delivery transformation in historically industrial but under-served areas such as Vereeniging.

4.2. Sedibeng District Municipality

The Sedibeng District Municipality (SDM) is one of the three district municipalities in Gauteng Province, comprising the following local municipalities: Emfuleni, Midvaal, and Lesedi (Sedibeng IDP, 2021). The district spans approximately 4,185 km² and borders the Free State Province to the south. Its central location along the Vaal River system gives it strategic significance in terms of bulk water infrastructure, industrial development, and cross-provincial water supply distribution.

Settlement Patterns and Housing: The region is primarily urbanised, with formal residential zones concentrated in Vereeniging, Vanderbijlpark, Meyerton, and Heidelberg. According to the Stats SA Community Survey (2016):

- Approximately 85% of households in Sedibeng reside in formal dwellings,
- Over 90% have access to electricity for lighting,
- Around 88% have piped water either inside the dwelling or on-site.

These figures reflect the district's relatively advanced service delivery status compared to the national average. However, areas such as Sebokeng, Boipatong, and Evaton within Emfuleni continue to face infrastructure backlogs, informal housing growth, and sanitation challenges (COGTA, 2022).

Water, Sanitation, and Bulk Infrastructure: Sedibeng hosts a large portion of Gauteng's critical water infrastructure, including the Rand Water Vereeniging Water Treatment Works, sludge pipelines, and reservoirs. The Vaal River system, which includes tributaries such as the Rietspruit and Klip Rivers, serves as the primary water source for Gauteng and several neighboring provinces (Rand Water & Selahle, 2025).

The municipality accommodates a network of:

- Bulk water pipelines and pump stations,
- Wastewater treatment works (WWTWs) in Leeuwkuil, Sebokeng, and Meyerton,
- Industrial water users, particularly steel, energy, and chemical manufacturers along the Vaal industrial belt.

This infrastructure is aging, and several plants are under pressure due to under-maintenance and increased demand. The Rand Water System 1 Upgrade will address some of these challenges by increasing treatment capacity and improving sludge handling efficiency.

Economic Profile and Industrial Development: Sedibeng has historically served as Gauteng's heavy industry zone, with strong footprints in steel production, engineering, utilities, and logistics. Although its share of the provincial GDP has declined in recent years, it remains economically significant due to:

- The Vaal River Special Economic Zone (SEZ) initiative aimed at revitalizing industry,
- A well-developed transportation network, including access to the N1, R59, and railway lines,
- Rand Water's role in anchoring infrastructure expansion and water security (GDED, 2023; Sedibeng IDP, 2021).

The economy is currently being repositioned toward infrastructure renewal, local economic development (LED), and environmentally sustainable service delivery.

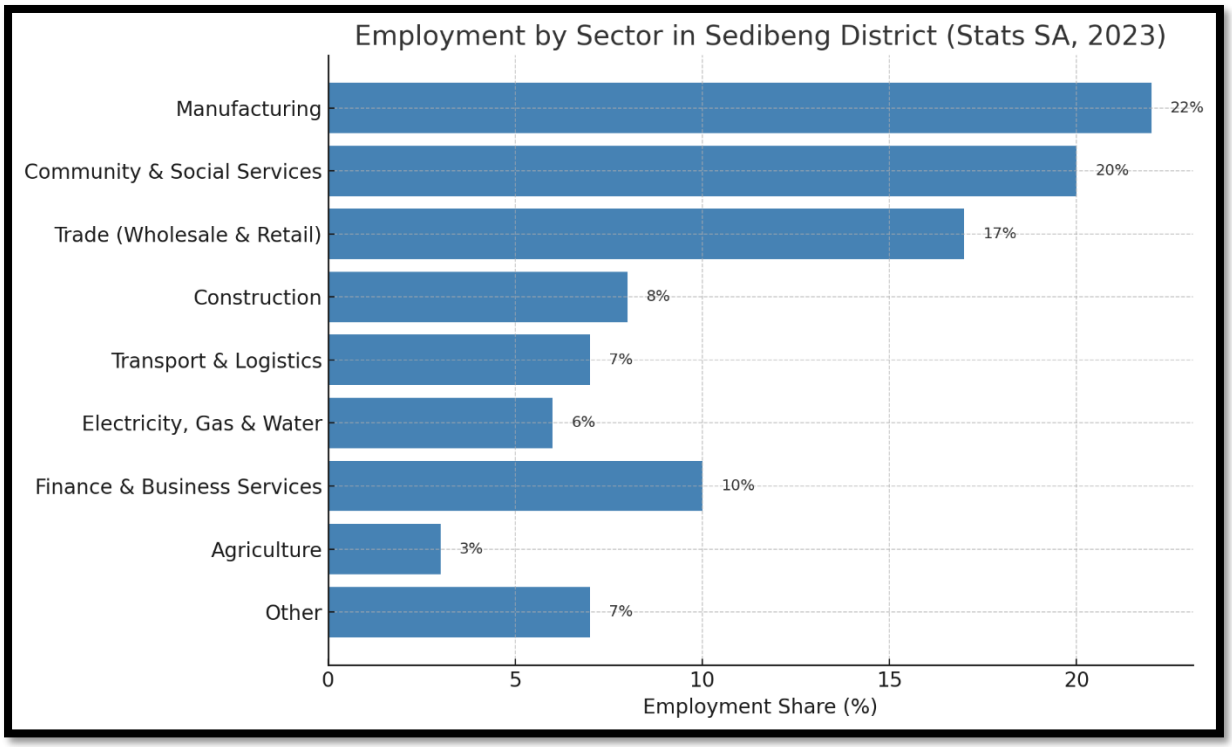


Figure 10: Employment by Sector in Sedibeng District – Stats SA, 2023

Socio-Economic Challenges: While infrastructure access levels are relatively high, socio-economic conditions vary significantly across the district:

- Youth unemployment exceeds 45%, especially in township areas (Stats SA, 2023),
- Water leaks, sewage spills, and pipeline bursts are common in Emfuleni due to aging systems (COGTA, 2022),
- Financial instability and governance constraints have led to repeated service delivery protests.

The Rand Water project is thus expected to:

- Create temporary jobs during construction,
- Improve operational efficiency and public health outcomes, and
- Reinforce the resilience of bulk water infrastructure across the district (Rand Water & Selahle, 2025).

4.3. Vereeniging Local Context

The town of Vereeniging, located within the Emfuleni Local Municipality in the Sedibeng District, forms the geographic and operational focal point of the proposed Rand Water System 1 upgrade and sludge pipeline installation project. Vereeniging has long been recognised as a strategic industrial hub within Gauteng Province due to its proximity to the Vaal River, its historic steel and manufacturing base, and its central role in water treatment and distribution infrastructure (Sedibeng IDP, 2021).

The 2022/2023 Sedibeng District Annual Report indicates that unemployment, especially among youth, remains above 45%. However, active socio-economic recovery programmes are in place:

- IT Skills Development**: 100 youth are undergoing technical training to support digital transformation.
- Agri-Summit Engagement**: Over 300 farmers were engaged in commercial agriculture development, positioning agriculture as a core recovery driver.
- Public Infrastructure**: The District completed the refurbishment of the Vereeniging Taxi Rank and initiated investor-driven upgrades to the Fresh Produce Market.
- Healthcare**: The Zone 17 Clinic has improved access to primary health services.
- HIV/AIDS Programmes**: Funded by the Gauteng Department of Health to support vulnerable populations.

These developments create a positive environment for social benefit alignment with the Rand Water project.

4.3.1 Urban-Industrial Character and Land Use

Vereeniging presents a predominantly urban-industrial character, with well-established municipal infrastructure supporting a blend of:

- Heavy and light industry,
- Residential neighbourhoods ranging from high-income suburbs to township settlements,

- Commercial zones including shopping centres, informal markets, and business parks,
- Institutional land uses such as schools, clinics, and administrative buildings.

The area exhibits mixed-use zoning, especially around the central business district (CBD) and along major corridors such as General Smuts Drive and the R42, where industrial activities interface directly with residential and service land uses. This dynamic urban fabric requires careful coordination when planning and implementing large-scale infrastructure developments to minimise disruptions and ensure stakeholder alignment (Gauteng SDF, 2020).

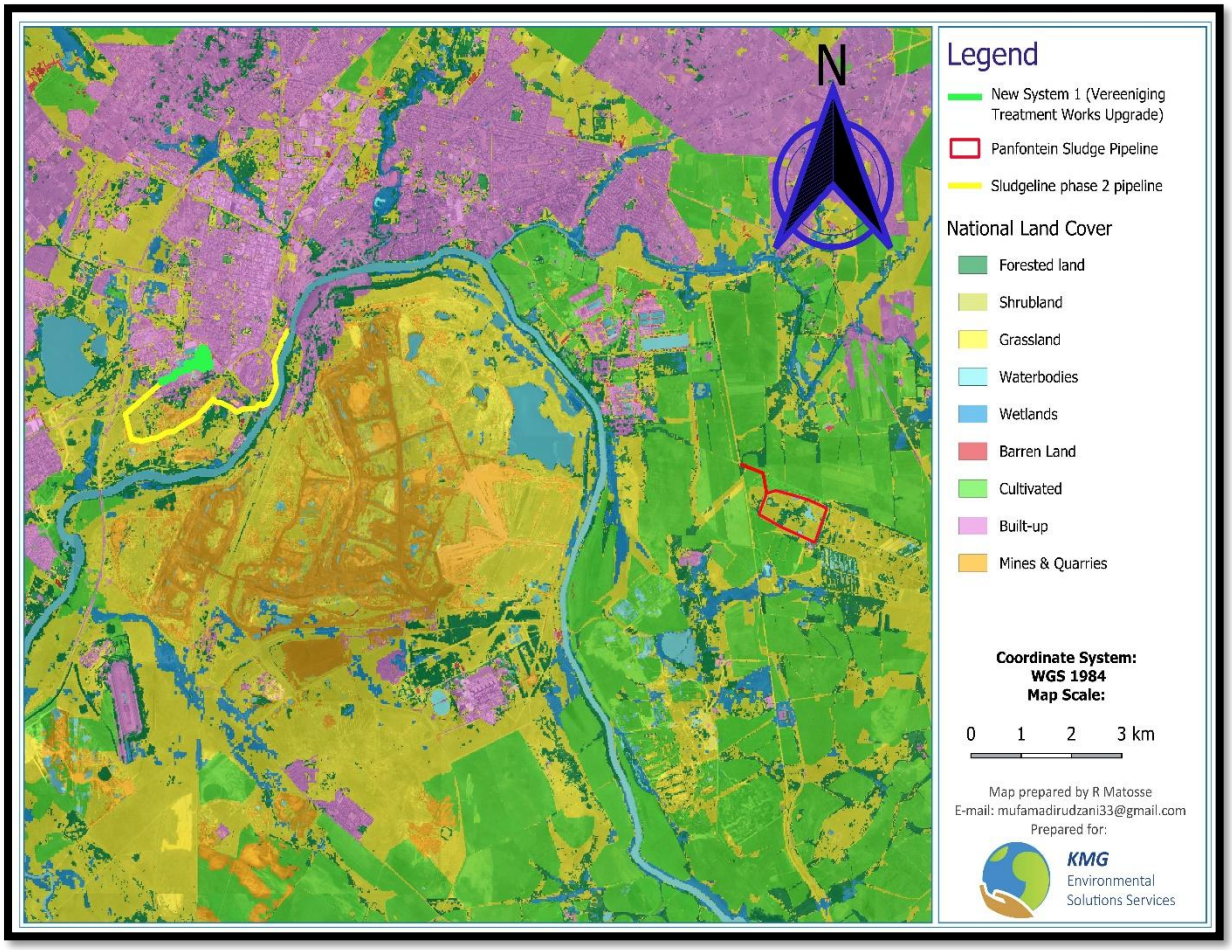


Figure 11: Zoning and Land Use Composition Map

4.3.2 Infrastructure Sensitivities and Urban Pressures

Due to its historical development and current service demands, Vereeniging faces several urban management and infrastructure pressures:

- Aging bulk services infrastructure, including water mains, sewer systems, and stormwater drains, which are often impacted by construction activities or require relocation during upgrades (COGTA, 2022).
- High traffic volumes, particularly in and around industrial zones and arterial roads, create risks for congestion, pedestrian safety, and access interruptions during construction phases.
- Service overlap, where roads, communication cables, gas lines, and water infrastructure often share corridors, increasing the risk of unintended utility disruptions during excavation and trenching.

Given these conditions, construction of the sludge pipelines and associated facilities must be sequenced and communicated carefully to avoid compromising existing municipal services or road infrastructure.

4.3.3 Community Expectations and Stakeholder Issues

Feedback from preliminary stakeholder engagement, previous Rand Water projects, and environmental screening processes indicates that local communities in and around Vereeniging generally support infrastructure development that:

- Improves service delivery, particularly in historically under-served areas such as Sharpeville and parts of Duncanville,
- Creates temporary and permanent employment opportunities, particularly for local youth and emerging contractors,
- Minimises disruption to daily activities, especially in commercial nodes and around institutional facilities (Rand Water).

Key social concerns identified for this project include:

- Traffic disruptions and detours near pipeline routes and plant entrances,
- Construction noise and dust affecting surrounding residential and commercial areas,
- Access to employment opportunities, with emphasis on local labour, SMMEs, and skills development,
- Utility disruptions, particularly water and electricity interruptions, if construction damages existing infrastructure.

These concerns require targeted mitigation measures, such as the deployment of traffic management plans, adherence to construction noise and dust standards (SANS 10103), local procurement strategies, and effective community liaison mechanisms throughout the project lifecycle.

Vereeniging's dense, mixed-use urban environment makes it a highly suitable location for infrastructure upgrades—particularly water and sludge systems that benefit the entire Gauteng region. However, the social and infrastructural sensitivities of the area must be carefully managed through integrated planning, community engagement, and phased construction. Doing so will not only reduce negative impacts but also enhance public trust and contribute to local socio-economic uplift.

4.3.4 Emfuleni Local Municipality and Midvaal Local Municipality: Demographic and Social Profile

To provide a more detailed understanding of the social and economic dynamics within the project's area of influence, this section presents key demographic indicators for Emfuleni Local Municipality, where Vereeniging is located. These indicators are crucial for identifying potential risks, opportunities, and community sensitivities that may influence or be influenced by the proposed project. The visual representations below offer a clear and accessible summary of the following variables: Racial Composition, Employment and Unemployment Rates, Monthly Household Income Distribution, Access to Basic Services, and Education Levels. These insights support data-driven decision-making for inclusive planning, stakeholder engagement, and impact mitigation

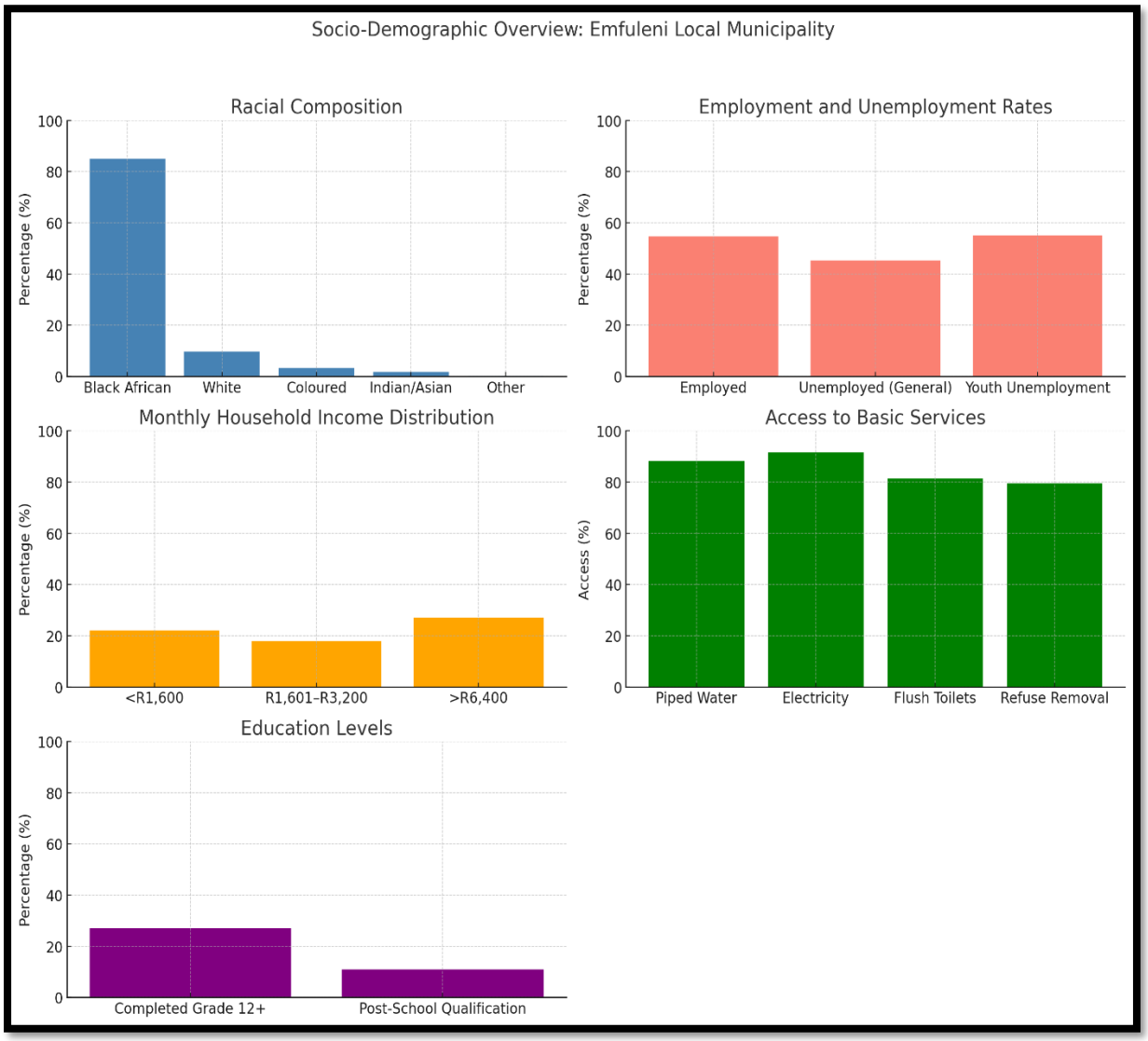


Figure 12 : Emfuleni Local Municipality - Socio -Demographic Overview

4.3.4.1 Population and Racial Composition

As of the **Stats SA Community Survey (2016)** and estimates from **2023**, Emfuleni has an approximate population of **721,663 people**. The racial composition is as follows:

Table 8: Population and Racial Composition

Population Group	Percentage (%)
Black African	85.1%
White	9.7%
Coloured	3.2%

Indian/Asian	1.8%
Other	0.2%

Note: Vereeniging reflects a similar profile, with increased diversity in specific suburbs like Three Rivers and Arcon Park.

4.3.4.2 Employment and Economic Activity

According to the **Stats SA Quarterly Labour Force Survey (Q3 2023)**:

- **Unemployment rate (broad)**: ±45.3% in Emfuleni
- **Youth unemployment**: Exceeds 55%
- **Major employment sectors**: Manufacturing, trade, public administration, construction, and utilities

Many residents are engaged in **formal and informal economic activity**, including:

- Retail and spaza shops
- Waste recycling and transportation
- Local service provision (plumbing, security, food services)

4.3.4.3 Income and Poverty Indicators

- Approximately 31% of households live below the upper-bound poverty line.
- Household monthly income:
  - ✓ <R1,600: 22%
  - ✓ R1,601 – R3,200: 18%
  - ✓ R6,400: 27%
- Social grants, including child support and old-age pensions, are a major income source for low-income households.

4.3.4.4 Access to Basic Services

Table 9: Access to Basic Services

Service Category	**Access Rate (%)**
Piped water inside dwelling or yard	88.3%
Electricity (lighting)	91.6%
Flush toilets connected to sewerage	81.4%

Weekly refuse removal	79.5%

While formal areas are well serviced, informal settlements (e.g., parts of Sebokeng and Evaton) experience backlogs in:

- Sewer connections
- Stormwater management
- Road infrastructure

4.3.4.5 Education and Youth Development

- About **27% of residents** have completed **Grade 12 or higher**.
- Only **11%** have post-school qualifications.
- Limited access to tertiary education and youth skills training has contributed to structural unemployment.

4.3.4.6 Health and Social Conditions

The area is served by facilities such as **Kopanong Hospital** and local clinics, but faces challenges including:

- Overburdened public health facilities
- Intermittent medicine stockouts
- High prevalence of chronic illnesses and substance abuse (especially among youth)

4.3.4.7 Relevance to the Proposed Project

Understanding these demographic indicators is critical to ensuring that the Rand Water project delivers equitable, responsive, and socially inclusive outcomes. The success of any large-scale infrastructure project, particularly in historically marginalised and economically vulnerable areas such as Emfuleni, depends not only on engineering performance but also on how well it engages with and uplifts the surrounding communities. The following considerations are essential:

- **Designing Inclusive Employment and Procurement Strategies**

The high levels of unemployment—especially youth unemployment exceeding 55%—underscore the need for targeted local labour recruitment, both during construction and for long-term maintenance roles. By prioritising labour-intensive methods where feasible, and ensuring transparent recruitment processes in partnership with ward councillors, community forums, and local development offices, the project can help to address income inequality. Similarly, procurement strategies should aim to include local SMMEs, cooperatives, and emerging contractors in supply chain opportunities for materials, transport, security, catering, and waste management. This ensures that project benefits extend beyond wages and foster local economic growth.

- **Mitigating Impacts on Vulnerable Households**

The project's construction footprint—particularly along roads, pipeline routes, and around water treatment facilities—may affect pedestrian access, informal traders, and households reliant on public transport, schools, or clinics. Many of these individuals live on low or fixed incomes and lack alternative access routes or transport options. Understanding the spatial distribution of vulnerable households enables Rand Water and the appointed contractors to implement targeted mitigation measures, such as:

- ✓ Maintaining temporary footpaths,
- ✓ Scheduling work during off-peak hours,
- ✓ Providing early notifications and alternative access plans.

This approach reduces community frustration and avoids unintended social hardship.

- **Ensuring Effective Communication in Multiple Languages**

With a linguistically diverse population—including speakers of **Sesotho, isiZulu, Afrikaans**, and **English**—effective stakeholder engagement requires **multilingual communication tools**. Notices, community briefings, grievance procedures, and signage should be available in **at least three of the dominant local languages** to ensure that:

- ✓ Information is accessible to all age groups and literacy levels,
- ✓ Safety instructions are understood clearly near worksites,

- ✓ Project milestones and disruptions are transparently communicated.

Failure to address language needs could result in **misinformation, safety risks**, and resistance from affected parties.

- **Creating Training Opportunities for Local Youth and Unemployed Persons**

Given the education profile of Emfuleni—where a substantial portion of youth have matric but limited post-school qualifications—the project provides an opportunity to incorporate skills transfer, on-the-job training, and certified short courses through partnerships with TVET colleges or the EPWP (Expanded Public Works Programme). Initiatives such as:

- ✓ Basic civil works training,
- ✓ Health and safety induction,
- ✓ Environmental awareness workshops, will not only support immediate employment but also improve long-term employability beyond the project scope.

- **Enhancing the Long-Term Social Sustainability of Rand Water's Investment**

By addressing demographic realities through inclusive planning, the project can move beyond compliance and act as a catalyst for community transformation. This includes building trust between Rand Water and the local population, setting a precedent for socially responsible infrastructure development, and leaving behind a positive legacy of empowerment, access, and improved quality of life.

Moreover, such strategies reduce the risk of community dissatisfaction, protests, or project delays, helping Rand Water meet its operational and environmental goals efficiently while also contributing to Gauteng's broader development vision.

5. SOCIAL IMPACT RATING METHODOLOGY

The Social Impact Assessment (SIA) methodology for the proposed Rand Water New System 1 Upgrade and Sludge Pipeline Installation Project is designed to identify, evaluate, and respond to potential social impacts arising from project activities across its life cycle. This assessment focuses on both construction and operational phases, and follows the best practice principles of integrated environmental management, as prescribed under the National Environmental Management Act

(NEMA), 1998 (Act No. 107 of 1998) and supported by guidelines such as the DEADP (2007) SIA framework.

Impact Assessment Criteria

The impact assessment uses a set of standardized criteria to ensure consistency, transparency, and defensibility in evaluating the significance of potential social impacts. These criteria include:

Nature of the Impact

The type of change expected in the social environment—either positive (beneficial) or negative (adverse). This refers to the effect the activity has on people, communities, services, or institutions.

Source of the Impact

The activity or process causing the impact—such as pipeline trenching, access road upgrades, water treatment operations, or contractor mobilisation.

Extent (Spatial Scale)

The geographic area affected by the impact, classified as:

- Site-specific
- Local (e.g., parts of Vereeniging)
- Regional (e.g., Sedibeng District)
- National (in the context of strategic water infrastructure)

Duration

The lifetime of the impact relative to the project. This includes:

- Short-term: During construction only
- Medium-term: Persisting through operational ramp-up
- Long-term or Permanent: Continuing after project closure

Intensity (Magnitude or Severity)

Assesses the degree of change introduced by the impact:

- Low: Minimal disturbance, limited to specific receptors
- Medium: Noticeable change requiring active mitigation

- High: Significant or irreversible change to social systems or services

Probability

The likelihood of the impact occurring, ranked as:

- Unlikely
- Possible
- Likely
- Definite

Mitigation Considerations

All identified impacts are assessed both before and after the implementation of mitigation measures. Where negative impacts are anticipated, feasible mitigation strategies are proposed to:

- Avoid or reduce the severity of the impact,
- Rehabilitate affected systems or stakeholders,
- Enhance resilience or adaptation capacity.

Mitigation ensures that project design and implementation align with sustainable development objectives, as per NEMA Section 2 Principles. Positive impacts are enhanced through targeted measures, such as prioritising local employment, capacity building, and inclusive procurement.

Managing Subjectivity and Prioritising Key Issues

Due to the inherently qualitative nature of social assessments, impact rating can involve subjective judgments. To address this, the assessment prioritises key issues identified through:

- Desktop review of planning and socio-economic data,
- Site observations and screening,
- Issues raised by stakeholders during consultation,
- Experience from similar water infrastructure projects.

Rather than assigning numeric scores alone, the report emphasises narrative justifications supported by professional judgment, contextual data, and previous precedent in similar developments.

Project Phases Assessed

The impacts are categorised according to two core project phases:

- **Construction Phase:** Includes all temporary activities associated with site preparation, pipeline trenching, heavy vehicle movement, demolition, material storage, and temporary disruptions to infrastructure or community services. These are typically short- to medium-term in duration.
- **Operational Phase:** Covers long-term water treatment and sludge handling operations, including access road use, ongoing water abstraction and discharge, and routine maintenance. Impacts during this phase tend to be more systemic and require enduring mitigation or monitoring protocols.

The methodology applied ensures that the social impacts of the Rand Water infrastructure upgrade are assessed holistically, accounting for geographic scale, temporal duration, intensity, and community vulnerability. The results of this impact assessment, along with mitigation and enhancement measures, are presented in the following section (Section 6: Social Impact Assessment Results).

Table 10: Impact Evaluation Matrix

Criterion	Rating Scale / Value	Description	Category
Nature of the Impact	Positive / Negative	Indicates whether the impact is beneficial or adverse to social receptors.	Impact Type
Source of the Impact	Project Activity	Identifies the specific project action or source causing the impact (e.g., trenching, plant upgrade).	Impact Source
Extent	Site-specific / Local / Regional / National	Determines the spatial area affected by the impact.	Geographic Scale
Duration	Short-term / Medium-term / Long-term / Permanent	Refers to how long the impact will	Temporal Scale

		persist relative to the project life cycle.	
Intensity	Low / Medium / High	Measures the severity or magnitude of the impact on affected parties or systems.	Severity
Probability	Unlikely / Possible / Likely / Definite	Evaluates the likelihood that the impact will occur based on available evidence.	Likelihood
Significance	Low / Medium / High	Overall importance of the impact, considering all criteria and its management priority.	Overall Evaluation

6. ASSESSMENT OF KEY SOCIAL IMPACTS

This section outlines the anticipated positive and negative social impacts associated with the implementation of the proposed Rand Water project, divided across the construction, operational, and cumulative impact phases. Each impact category is analysed in terms of its significance, affected receptors, and potential mitigation or enhancement measures.

6.1 Construction Phase Impacts

The construction phase will **involve earthworks, trenching, demolition of existing infrastructure,** installation of pipelines, and construction of associated infrastructure such as sedimentation tanks, dosing bays, and laboratories. These activities will generate both short-term benefits and disruptions, particularly in areas with mixed residential and industrial land uses.

Positive Impacts

- **Short-term Job Creation (Skilled and Unskilled Labour)**

  The project is expected to create employment opportunities for local residents during the construction phase. This includes skilled trades (e.g., electricians, pipe fitters) and unskilled roles (e.g., general labourers, flag personnel). Local hiring will provide short-term income support and help stimulate economic activity in surrounding communities such as Duncanville, Sharpeville, and Vereeniging CBD.
- **Procurement Opportunities for Local Suppliers and SMMEs**

  Construction activities will require equipment, consumables, catering, transportation, and other support services. Local small, medium, and micro enterprises (SMMEs) stand to benefit from sub-contracting and procurement opportunities, provided inclusive supply chain policies are implemented.

Negative Impacts

- **Disruption to Existing Utilities and Services**

  Trenching for pipeline installation may intersect or run parallel to existing utility corridors. This can result in temporary interruptions to water, electricity, gas, and telecommunications infrastructure, particularly where service coordination is weak or as-built drawings are outdated.
- **Noise, Dust, and Traffic Congestion**

  Construction machinery, site clearing, and vehicle movement will generate **noise and dust**, especially near residential areas, schools, and businesses. Increased **heavy vehicle traffic** may cause congestion and pose safety risks to pedestrians, particularly on narrow or mixed-use roads.
- **Temporary Access Restrictions**

  Construction fencing and equipment staging may temporarily block access to **businesses, residences, or institutions**, particularly in areas where the pipeline route traverses busy urban corridors. These disruptions may affect foot traffic, service delivery, and emergency vehicle access.

6.2 Operational Phase Impacts

Once constructed, the infrastructure will transition into full operational use. This includes **automated water treatment, sludge handling, and integrated laboratory monitoring**, as well as routine pipeline inspections and maintenance.

Positive Impacts

- **Improved Long-Term Infrastructure Efficiency and Service Delivery**
  The upgrade of System 1 will enhance Rand Water's capacity to provide reliable, high-quality water to Gauteng and neighbouring provinces. Improved operational reliability reduces the risk of supply interruptions, benefiting households, businesses, and institutions across the region.
- **Reduced Sludge Handling and Environmental Risk**
  Modernised sludge dewatering and pipeline conveyance will reduce the volume of sludge disposed of at old facilities, thereby lowering the environmental footprint and potential contamination of nearby watercourses, such as the Vaal River.
- **Boost to Regional Water Treatment Capacity**
  The integration of new flocculation and sedimentation systems increases Rand Water's capacity to meet future demand, especially as urbanisation intensifies. This aligns with long-term strategic development frameworks in Gauteng.

Negative Impacts

- **Long-Term Land Use Change and Infrastructure Footprint**
  The permanent placement of new infrastructure—including pipelines, dosing facilities, and laboratories—may limit future alternative land uses along the corridor. Although the area is predominantly urban-industrial, minor displacement of informal uses (e.g., small traders or storage) may occur.
- **Risk of Unplanned Leaks or Infrastructure Bursts**
  Over time, the pipeline system and sludge-handling equipment may be vulnerable to mechanical failures or external interference. Uncontrolled leaks or bursts could disrupt nearby land uses and pose health or environmental risks.

6.3 Cumulative Impacts

The cumulative impact assessment considers the **interacting effects** of the proposed project with other developments and existing stressors in the region.

- **Cumulative Pressure on Regional Infrastructure Corridors**
  The addition of a new 7 km pipeline and associated works increases the use intensity of existing municipal servitudes, many of which already accommodate roads, electrical lines, and water infrastructure. This may exacerbate maintenance challenges, particularly in areas with limited municipal capacity.
- **Need for Coordinated Stakeholder Engagement**
  Multiple stakeholders—including Rand Water, the Department of Water and Sanitation (DWS), South African Heritage Resources Agency (SAHRA), Emfuleni Local Municipality, and local businesses—must work together to avoid conflict and ensure smooth integration of the infrastructure. This is especially important where heritage permits, WULAs, and overlapping developments are concerned.
- **Potential Overlap with Future Urban Expansion or Utility Projects**
  Given Vereeniging's position within a strategic growth corridor, the installed infrastructure must be factored into long-term urban development plans to avoid conflicts with future housing, roads, or industrial expansion

6.4 Decommissioning Phase

Although decommissioning is not planned in the near term, any future removal, replacement, or relocation of infrastructure components must be considered in terms of potential social implications.

Potential Impacts

- **Employment Losses**
  Jobs created for operational or maintenance activities may be terminated if infrastructure is decommissioned, affecting household incomes.
- **Noise, Dust, and Traffic During Dismantling**
  Activities such as dismantling sedimentation tanks, breaking down structures, or removing pipelines may create construction-like nuisances similar to the initial construction phase.

- **Hazardous Waste and Material Handling**

  Improper handling of old infrastructure, chemicals, or sludge residues may pose health and environmental risks.

- **Loss of Local Economic Activity**

  Suppliers or small businesses providing operational support services may lose their markets.

Recommended Mitigation Measures

- Advance notice and stakeholder consultation to inform affected communities.
- Implement retrenchment support and job reallocation where possible.
- Adhere to safety and environmental standards in dismantling and waste disposal.
- Rehabilitate affected land to a usable or ecologically acceptable state.
- Record and preserve any infrastructure of heritage or utility value before removal.

Table 11: Assessment of Key Social Impacts – Summary Table

Phase	**Impact Description**	**Receptors Affected**	**Significance (Pre-Mitigation)**	**Proposed Mitigation / Enhancement**	**Residual Significance (Post-Mitigation)**
Construction	Temporary traffic congestion and safety risks due to construction vehicles	Motorists, pedestrians, schoolchildren, public transport users	Medium	Traffic Management Plan, signage, scheduling heavy vehicle movement during off-peak hours	Low
Construction	Short-term employment for local skilled and unskilled workers	Local residents, youth, SMMEs	Medium	Prioritise local hiring, skills development, link to EPWP	High

				or youth programs	
Construction	Disruption to utilities (water, electricity, telecoms) during trenching	Households, businesses, public institutions	High	Coordinate with service providers, update service maps, use permit-based trenching	Medium
Construction	Increased dust and noise levels affecting schools and residences	Residents near sites, schools, healthcare centers	Medium	Implement dust suppression, enforce working hours, use barriers and PPE	Low
Construction	Temporary access restrictions to businesses and institutions	Business owners, customers, service providers	Medium	Design detour paths, provide advance notice and directional signage	Low
Operational	Improved long-term water supply reliability across Gauteng	General public, municipalities, commercial users	High	Routine maintenance, integration with long-term infrastructure planning	High

Operational	Permanent change in land use along pipeline servitudes	Adjacent landowners, developers, municipalities	Medium	Clear servitude demarcation and land use zoning control	Low
Operational	Risk of mechanical failures (pipeline bursts or leakages)	Nearby communities, water users, Rand Water operations	Medium	Monitoring systems, emergency response planning, use of quality materials	Low
Cumulative	Pressure on existing shared utility corridors and maintenance capacity	Municipal engineers, planners, utility providers	Medium	Integrated spatial planning, maintenance schedule coordination	Low
Cumulative	Risk of overlapping activities with future infrastructure or urban development	Developers, planners, Emfuleni LM, SDM	Medium	Align project with SDFs and IDPs, involve local planners in review process	Low
Cumulative	Requirement for sustained coordination with regulatory authorities	Project managers, permitting authorities, heritage stakeholders	High	Establish stakeholder forum, schedule regular	Medium

	(DWS, SAHRA)			briefings and reporting	

7. CONCLUSION AND RECOMMENDATIONS

7.1 Summary of Key Findings

The Social Impact Assessment (SIA) has found that the proposed Rand Water infrastructure upgrade aligns strongly with national, provincial, and local development priorities, including the National Water and Sanitation Master Plan, the Gauteng Growth and Development Strategy (GGDS 2030), and the Sedibeng District Municipality Integrated Development Plan (IDP 2021–2026). It offers:

- Enhanced economic opportunities through synergy with EPWP and IT training schemes.
- Strengthened service delivery through integration with healthcare and local economic development.
- Opportunity to bolster Sedibeng's District Development Model (DDM) by leveraging social licence and stakeholder partnerships

The project is expected to yield substantial long-term socio-economic and environmental benefits, particularly in enhancing water security, sludge management, and service delivery resilience for the Gauteng region. While short-term negative impacts will be experienced during construction (e.g., access restrictions, noise, and utility disruptions), these are considered manageable with appropriate planning, public communication, and mitigation.

The assessment further considers the potential cumulative pressures on shared infrastructure corridors and acknowledges the importance of integrating the project with spatial development frameworks, heritage compliance, and future urban expansion.

7.2 Mitigation Measures

A summary of key mitigation actions required across project phases is presented below:

Impact	**Recommended Mitigation**

Construction disruptions	Implement Traffic Management Plans, daily scheduling, and stakeholder notices.
Employment expectations	Prioritize local labour and SMME participation with transparent recruitment processes.
Access limitations	Maintain access through signage, scheduling, and alternative route planning.
Dust and noise	Adhere to **SANS 10103** standards, use suppression techniques and noise barriers.
Utility service interruptions	Coordinate with utility providers, use updated as-built maps, and permit-based trenching.
Operational land use change	Secure and demarcate servitudes with appropriate zoning and planning consultation.
Leak or burst risks	Install monitoring systems and rapid response protocols; conduct regular inspections.

7.3 Recommendations

Proceed with Project Implementation

- The project should move forward, subject to full implementation of the mitigation **measures**, monitoring protocols, and alignment with the EMPr and environmental authorisation conditions.

Establish and Maintain Effective Communication Channels

- Appoint a **Community Liaison Officer (CLO)** to:
  - ✓ Serve as the primary contact for stakeholder queries and grievances,
  - ✓ Facilitate communication between contractors, Rand Water, and affected communities,
  - ✓ Support employment tracking and complaint resolution processes.

Implement Social Monitoring and Reporting

- Develop a Social Performance Monitoring Programme to track:

  - ✓ Community complaints and resolution timelines,
  - ✓ Labour and procurement compliance with local targets,
  - ✓ Changes in service reliability and stakeholder satisfaction.
- Monitoring should cover:
  - ✓ Construction phase (monthly reporting),
  - ✓ First 12 months of operation (quarterly reporting),
  - ✓ Pre-decommissioning stage (planning horizon review, if triggered).

Prepare for Future Decommissioning Phase

Although decommissioning is not imminent, it is recommended that early planning protocols be established, including:

- A Decommissioning Framework to guide safe removal, stakeholder notification, and land rehabilitation,
- Employment transition or compensation planning for operational staff and local suppliers,
- Identification of legacy infrastructure that may have heritage or continued service value (with SAHRA input).

Promote Inter-Governmental Coordination

- Rand Water, in collaboration with the EAP, must continue engagement with:
  - ✓ Emfuleni Local Municipality and Sedibeng District Municipality (for spatial planning integration),
  - ✓ Department of Water and Sanitation (DWS**)** (for water licensing and compliance),
  - ✓ South African Heritage Resources Agency (SAHRA) (for permits and cultural protection),
  - ✓ Utility providers (for shared service corridor management).

7.4 Final Statement

The proposed Rand Water New System 1 Upgrade and Sludge Pipeline Project offers a transformative and net positive long-term contribution to the broader goals of regional service delivery, public health, and infrastructure modernisation in Gauteng. Situated within a context of aging infrastructure, rising urban demand, and environmental stress, this project directly addresses key vulnerabilities in the

current water treatment and sludge management systems, while reinforcing Rand Water's capacity to meet future water security targets.

While temporary social impacts—such as access restrictions, traffic disruptions, construction noise, and dust—are anticipated during the construction phase, these have been assessed as low to medium in significance and are considered manageable through proactive mitigation measures. Such measures include stakeholder communication, traffic control, dust suppression, and access coordination—all of which have been carefully outlined in the project's Environmental Management Programme (EMPr) and supported by best practices in infrastructure development.

The success of this project, however, is not dependent solely on engineering excellence or environmental compliance. Rather, it hinges on the quality of community engagement, transparency in decision-making, and commitment to social responsiveness. With the establishment of a Community Liaison Officer (CLO), structured public feedback mechanisms, and dedicated social performance monitoring, the project creates opportunities to build trust, empower local stakeholders, and ensure that community voices are reflected in ongoing implementation.

Importantly, the long-term benefits of the project—such as reliable water supply, reduced environmental risks, increased operational efficiency, and the promotion of inclusive economic participation—are expected to far outweigh the temporary disruptions. When executed with integrity, this project has the potential to stand as a flagship example of socially responsible infrastructure development in South Africa. It will not only serve current generations, but also lay the groundwork for a more resilient, equitable, and sustainable future in the Gauteng Province and beyond.

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9. APPENDIXES

Appendix A Specialist Details

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Khumbelo Given Marabe – Accredited Environmental Scientist
SACNASP Reg. No. 132731 | WISA Member No. 39885 | IAIAsa Member No. 7837 | IIAV Member No. 3163

Khumbelo Given Marabe is a seasoned and accredited environmental scientist, registered with the **South African Council for Natural Scientific Professions (SACNASP)** as a Natural Scientist (Reg. No. **132731**). He is also a member of the **Water Institute of Southern Africa (WISA)** (Member No. **39885**), a full member of the **International Association for Impact Assessment South Africa (IAIAsa)** (Member No. **7837**), and an international member of the **International Institute of Acoustics and Vibration (IIAV)** (Member No. **3163**).

As the **Director and Principal Consultant** at **KMG Environmental Solutions Services**, Khumbelo leads multidisciplinary teams in conducting specialist environmental studies that meet regulatory and scientific standards. His expertise covers a wide array of assessments including **Social Impact Assessment, Agricultural impact assessments, wetland delineations, terrestrial biodiversity surveys, noise and air quality impact assessments**, and compliance audits.

Khumbelo practical field experience spans **social Impact assessments**, **soil capability classification**, **water and ambient air quality monitoring**, **noise surveys in industrial and sensitive environments**, and **biodiversity impact evaluations** for infrastructure, mining, and agricultural developments. His work is firmly rooted in both **South African environmental legislation** and international environmental standards.

Recognized for his scientific rigor and ability to translate technical findings into practical mitigation strategies, Khumbelo supports clients in achieving environmental compliance and sustainable outcomes. His leadership, technical depth, and effective stakeholder engagement contribute significantly to the success of environmental projects delivered by KMG Environmental Solutions Services.

Educational Background

University of Venda

2009 Bachelor of Environmental Sciences

- Natural environment as a system
- Introduction hydrogeology and soil science
- Ecological principles for environmental management
- Introduction hydrogeology and soil science
- Principles of resource management
- Pollution and environmental quality
- Resource evaluation & information system
- Environmental impact assessment & modeling [EIA]
- Integrated study of major world environment
- Spatial organization of society
- Quantitative and qualitative research
- Patterns and process in physical geography
- Themes on the geography of Africa
- Geomorphology
- Population and demography
- Remote sensing and geographic information system
- Climatology
- Core introduction to photo geology and remote sensing
- Conservation biology

HASLAC

2012 Certificate in Advanced Health and Safety

- Environmental regulation for work place
- Hazardous biological agents regulation
- Hazardous chemical substances regulation
- Lead regulation
- Explosive regulation
- Construction regulation

- Occupational; health safety act
- Safety standards
- Noise –induced hearing loss regulation **Legitimate Leadership**

2014 Certificate in first line management

- Care and Growth concept in leadership/management role

FESTO

2016 Water Treatment Certificate

GIBS-School of Business [University of Pretoria]

- 20218 -AECI Foundation Management Development Programme

GIBS-School of Business [University of Pretoria] 2020

- 2020-AECI Middle Management Development Programme

NEBOSH

- 2024-Environmental Management Certificate

NOSA

- **Combined ISO 45001:2018 and ISO 14001:2015 Introduction**
- **Combined ISO 45001:2018 and ISO 14001:2015 Implementation**
- **Combined ISO 45001:2018 and ISO 14001:2015 Internal Auditor**

University of South Africa (UNISA]

Ongoing: Bachelor honors in Environmental monitoring and modeling

Other certificates

- Environmental awareness [AEL Mining services], Asset Care, Organized workplace
- ISO14001 and IS045001 Certificate (NOSA)
- Internal Audit Certificate (NOSA)
- ETC

Knowledge

- Knowledge of National Environmental Management Act [waste, air quality, Noise, water , Biodiversity]
- Knowledge of Environmental Management System (ISO 14001) – Implementing, Monitoring and Auditing
- Knowledge of and ability to apply principles of sound management and budget
- Ability to plan and direct the work of subordinate employees

- Knowledge of the occupational hazards in Construction, Mining, Manufacturing and Agricultural including safety measures to be implemented.
- Ability to perform, analyze, and interpret laboratory tests for the purpose of making operational adjustments
- Ability to deal [communicate] effectively with people at all levels.

Experience

AECI Mining Explosive |Modderfontein
Manager -Effluent Plant, Lead Azide Plant & Spray Dry Plant [***2014*** – to date]
Responsible for the management and operation of ISAP Effluent Treatment Plant, Lead Azide Plant & Spray Dry Plant which include the following

Projects

- IS waste reduction projects –AECI Mining Explosive –Modderfontein
- Powders Old Effluent Plant closure and Decommissioning Project
- Nitrates Old TDP Decommissioning and Scrap removal Project
- Burning Ground Closure and Decommissioning Project
- Convectional Powders Plant Decontamination Project
- Water Reduction Projects
- Etc.

KMG Environmental Solutions Services
Principal Environmental Consultant – Environmental Monitoring / Impact Assessment Studies / Operations / Audits / Waste Management / Health and Safety / [***2020*** – to date]
Responsible for the management and operation of KMG Environmental Solutions Services which include the following

- Environmental Monitoring Projects
- Environmental Audits
- Environmental Impact Assessment Specialist Studies
- All Operations Projects such as installations of monitoring devices, Composite sampling devices, Dust Fall-out Stands
- Waste Management Projects
- License / Authorizations Applications for difference activities
- Occupational Health and Safety Projects
- Writing of Monitoring / Analysis Reports
- Consulting Work for Various Projects

Recent Projects

SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF NEW SYSTEM 1 AT RAND WATER VEREENIGING TREATMENT WORKS, INSTALLATION OF APPROXIMATELY 7 KM PHASE 2 SLUDGE PIPELINE IN VEREENIGING, 1.5 KM SLUDGE LINE IN PANFONTEIN AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF SEDIBENG DISTRICT MUNICIPALITY, GAUTENG PROVINCE.

- Agricultural Agro-Ecosystem assessment for the Proposed Rampawer 370MW Solar Photovoltaic (PV) & 20MW Battery Energy Storage System on Portion 239 of the Farm Hartebeespoort C 419 JQ
- Agricultural,Soil, Land Use, Land Potential And Land Capability Assessment for proposed uthukela special economic zone development in alfred duma local municipality, Kwazulu-natal.
- Soil, land use, land potential and land capability assessment for real development planning company(rdpc) in support of environmental authorization for proposed township establishment of the emzinoni extension 15, Govan Mbeki Municipality,Mpumalanga Province
- Soil, Land Use, Land Potential And Land Capability Assessment For Real Development Planning Company(Rdpc) In Support Of Environmental Authorization For Proposed Township Establishment Of The Emzinoni Extension 16,Govan Mbeki Municipality,Mpumalanga Province
- Soil, Land Use, Land Potential and Land Capability Assessment For Corobrik Rietvlei Mine Mining Right Amendment In Support Of Section 102 In Accordance To The Mineral Resources Development Act, Act 28 Of 2002 As Amended (Mpdra)
- Desktop Soil, Land Use, Land Potential and Land Capability Assessment For Lwabantu Mineral Resources (Pty)For The Proposed Mining Permit)
- Desktop Soil, Land Use, Land Potential and Land Capability Assessment For WSPS Holdings (Pty) Ltd For The Proposed Mining Permit)
- Agricultural Impact Assessment: Soil and Land Capability Assessment For The Proposed For The Proposed Witfontein Solar Farm
- Environmental Monitoring (Water, Dust, Noise, Audit and SHE services) Waste Storage Facility –**Gauteng Mental Recyclers**
- Environmental Monitoring (Water, Dust, Noise, Audit and SHE services) Waste Storage Facility -External Audit –**Gauteng Environmental Management**
- Environmental Monitoring (Dust fall-out, Water, Noise)- **JPG OHE Consultants (Pty)Ltd**
- Environmental Monitoring (Dust fall-out, Water, Noise) -**Tate and Lyle**
- Environmental Monitoring (Dust fall-out, Water, Noise)- **Fry's Metal**
- Environmental Monitoring (Dust fall-out, Water, Noise)- **FS Mining Wash Plant**
- Noise Surveys-**MS Mabuya Civil Lab**
- Environmental Awareness Training –**KMG Environmental Solutions Services**
- Waste Water Discharge Monitoring -ISAP Effluent Treatment Plant-**AECI Mining Explosive**
- Oil Contaminate Effluent Treatment Plant -**AECI Mining Explosive**
- Liming Station –Water Monitoring -**AECI Mining Explosive**
- Wastewater Treatment Facility Audit -**Royal Bafokeng Platinum Mine**
- Waste Disposal; Landfill Audit- **Royal Bafokeng Platinum Mine**
- Water Recycling and Sedimentation Line Design-**FS Mining Wash Plant**
- Water Sampling -**FS Mining Wash Plant**
- Air Quality Impact Assessment -**Tenbosh Mining**
- Soil Impact Assessment -**Corobrik**
- Biodiversity Monitoring -**Tate and Lyle**
- Environmental Awareness - **Food and Trees for Africa**

- Environmental Awareness Campaign –**Mupo Environmental Consultancy**

Achievements

- Hannel International Recognition for Workplace Environmental Awareness Training and Field Insights by Specialists
- First runner-up environmental awareness competition [AELMS]
- Successfully managed environmental awareness campaign [Food and Tress for Africa]
- Best first line management development programme participant [AELMS]

Personal attributes and skills

- Honest
- Creative
- Integrity
- Communication skills
- Team player skills
- Leadership skills
- Attention to details
- Enthusiasm and personal drive
- Ability to handle pressure and meet deadlines
- Always willing to lean
- Flexibility

References

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Full name	:	Madelaine de Vos
Name of company	:	JPG OHE Consultants (Pty)Ltd
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Full name	:	Kabelo Phakwago
Name of company	:	MK Envirosolution and Projects

SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF NEW SYSTEM 1 AT RAND WATER VEREENIGING TREATMENT WORKS, INSTALLATION OF APPROXIMATELY 7 KM PHASE 2 SLUDGE PIPELINE IN VEREENIGING, 1.5 KM SLUDGE LINE IN PANFONTEIN AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF SEDIBENG DISTRICT MUNICIPALITY, GAUTENG PROVINCE.

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Other references are available on request