

PROPOSED LIMPOPO CENTRAL HOSPITAL

FINAL EIA REPORT

FEBRUARY 2020

DEFF REFERENCE: 14/12/16/3/3/2/1132

PREPARED FOR: NATIONAL DEPARTMENT OF HEALTH






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Title and Approval Page

Project Name:	Proposed Limpopo Central Hospital
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Authority Reference:	14/12/16/3/3/2/1132
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Applicant:	National Department of Health
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Amendments Page

Date:	Nature of Amendment	Amendment Number:
07/11/2019	Draft EIA Report for Authority and Public Review Period	00
05/02/2020	Final EIA for submission to DEFF	01

Executive Summary

This document serves as the Final Environmental Impact Assessment (EIA) Report for the proposed Limpopo Central Hospital, situated in the Limpopo Province.

Project Background and Motivation

Public health infrastructure is a fundamental pillar in building a successful national health insurance programme. However, according to the National Service Delivery Agreement, the current public health infrastructure cannot adequately support the service delivery needs of the country. Health facility planning, including providing new hospitals and clinics and upgrading established facilities, needs to be expedited to increase citizen's access to a high standard of health care facilities. The fact that there is a significant shortage of skilled practitioners and health care workers in South Africa exacerbates the situation. Currently, the existing medical schools are unable to produce the requisite number of health professionals. If the country is to meet the requirements of the National Health Insurance (NHI) goals of more equitable access to high-quality health services for all South Africans, both the academic component and health service provisioning must be improved.

Project Description

The building of a proposed new 488 bed central hospital, Limpopo Central Hospital, on a new site in Polokwane, will provide tertiary care for the province and will be the major teaching hospital for the University of Limpopo Faculty of Health Sciences and School of Medicine. The proposed Limpopo Central Hospital is situated within the Limpopo Province, and the proposed project footprint falls within the jurisdiction of the Capricorn District Municipality (DM), and the Polokwane Local Municipality (LM). The proposed Limpopo Central Hospital is situated between Edupark, the Northern Academy Secondary School and the N1 road. The proposed site is located on the remainder of Erf 6861 of Pietersburg Extension 30.

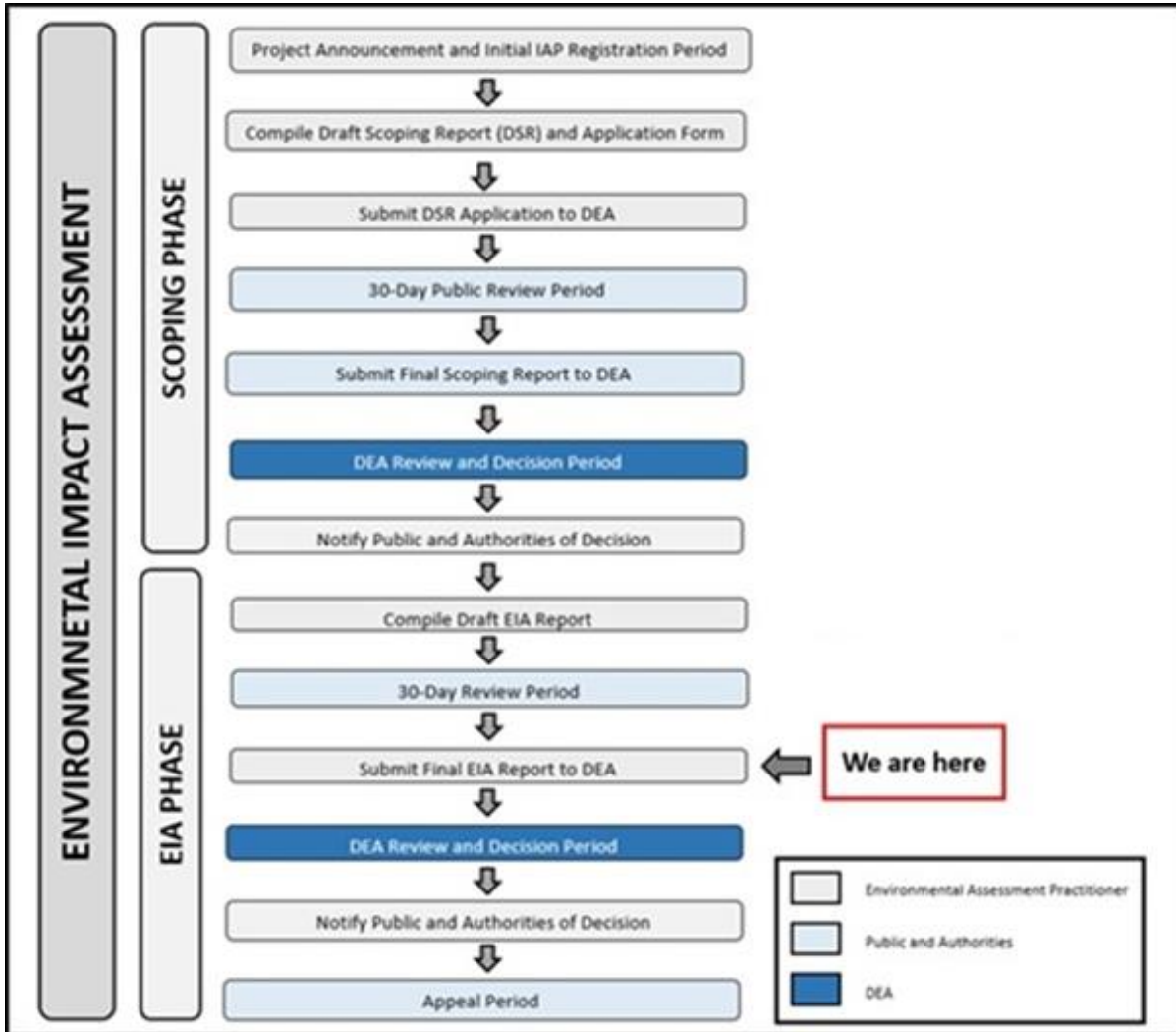
Legislative Framework

The pertinent environmental legislation that has bearing on the proposed development is considered. A description of the policy and legislative context within which the development is proposed, including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity, have been considered in the EIA Process.

Scoping and EIA Process

The process for seeking authorisation under the National Environmental Management Act (Act No. 107 of 1998) is undertaken in accordance with Government Notice (GN) No. R. 982 of 4 December 2014 (as amended on 7 April 2017), promulgated in terms of Chapter 5 of this Act.

Based on the types of activities involved, the requisite environmental assessment for the project is an EIA Process. An outline of the process is provided in the diagram to follow.



Outline of Scoping and Environmental Impact Assessment Process

In terms of the National Environmental Management Act (Act No. 107 of 1998) the lead decision-making authority for the environmental assessment is the Department of Environment, Forestry and Fisheries (DEFF), previously Department of Environmental Affairs (DEA), as the project proponent (National Department of Health) is a national department. Nema Consulting was appointed by the Sakhawo Health Solutions as the independent Environmental Assessment Practitioner (EAP) to undertake the environmental assessment for the proposed Limpopo Central Hospital.

Profile of the Receiving Environment

The EIA Report provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the environmental assessment was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed project. A brief overview is also

provided of the manner in which the environmental features may be affected (positively or negatively) by the proposed project.

The receiving environment is assessed and discussed in terms of the following:

- ❖ Land Use and Land Cover;
- ❖ Climate;
- ❖ Geology;
- ❖ Geohydrology;
- ❖ Soils;
- ❖ Topography;
- ❖ Surface Water;
- ❖ Terrestrial Ecology;
- ❖ Socio-Economic Environment;
- ❖ Agriculture;
- ❖ Air quality;
- ❖ Noise;
- ❖ Historical and Cultural Features;
- ❖ Planning;
- ❖ Existing Structures and Infrastructure;
- ❖ Transportation;
- ❖ Waste Disposal Facilities; and
- ❖ Aesthetic Qualities.

Summary of Specialist Studies

A crucial element of the Plan of Study for the EIA prepared during the Scoping Phase was to provide the Terms of Reference for the requisite Specialist Studies 'triggered' during the Scoping. The requisite Specialist Studies 'triggered' by the findings of the Scoping Process, aimed at addressing the key issues and compliance with legal obligations, include:

1. Agricultural Impact Assessment;
2. Riparian Habitat and Wetland Delineation Impact Assessment;
3. Heritage Impact Assessment;
4. Socio-Economic Impact Assessment; and
5. Terrestrial Ecological Impact Assessment.

Impact Assessment

The EIA Report focusses on the pertinent environmental impacts that could potentially be caused by the proposed project during the pre-construction, construction and operational phases.

Impacts were identified as follows:

- ❖ An appraisal of the project activities and components;
- ❖ Impacts associated with listed activities contained in GN No. R. 983, R. 984 and R. 985 of 4 December 2014, as amended, for which authorisation has been applied for;
- ❖ An assessment of the receiving biophysical, social, economic and built environment;
- ❖ Findings from specialist studies;
- ❖ Issues highlighted by environmental authorities; and
- ❖ Comments received during public participation from Interested and Affected Parties (IAPs).

Public Participation

The EIA Report provides a full account of the public participation process that was followed for the EIA Phase for the proposed project. The public review period of the Draft EIA Report took place from **07 November to 06 December 2019**.

All authorities and registered IAPs will be notified via email or SMS after having received written notice from DEFF on the final decision for the project. Advertisements will also be placed as notification of the Department's decision. These notifications will include the appeal procedure to the decision and key reasons for the decision.

EIA Conclusion and Recommendations

Attention is drawn to specific sensitive environmental features (with an accompanying sensitivity map) for which mitigation measures are included in the EIA Report and Environmental Management Programme (EMPr).

An Environmental Impact Statement is provided and critical environmental activities that need to be executed during the project life-cycle are also presented.

With the selection of the Best Practicable Environmental Option (BPEO), the current proposed layout, the adoption of the mitigation measures included in the EIA Report and the dedicated implementation of the EMPr, it is believed that the significant environmental aspects and impacts associated with this project, can be suitably mitigated.

With the aforementioned in mind, it can be concluded that there are no fatal flaws associated with the project, and that authorisation can be issued, based on the findings of the specialists and the impact assessment, and through the compliance of the identified environmental management provisions.

This EIA Report is concluded with key recommendations, which may also influence the conditions of the Environmental Authorisation (if granted).

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List of Acronyms & Abbreviations

BID	Background Information Document
CRR	Comments and Responses Report
DEFF	Department of Environment, Forestry and Fisheries
DWS	Department of Water and Sanitation
DM	District Municipality
DMRE	Department of Mineral Resources and Energy
DoH	National Department of Health
DSR	Draft Scoping Report
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FSR	Final Scoping Report
GIS	Geographical Information System
GN	Government Notice
HCRW	Health Care Risk Waste
IAPs	Interested and Affected Parties
IDP	Integrated Development Plan
IWMP	Integrated Waste Management Plan
LCH	Limpopo Central Hospital
LIHRA	Limpopo Provincial Heritage Resources Authority
LDEDET	Limpopo Department of Economic Development, Environment and Tourism
LM	Local Municipality
NEMA	National Environmental Management Act (No. 107 of 1998)
NHI	National Health Insurance
PICC	Presidential Infrastructure Coordinating Commission
PPP	Public Private Partnership
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SIPs	Strategic Integrated Projects
SMME	Small, Medium and Micro-sized Enterprises
ToR	Terms of Reference
WMA	Water Management Area

1 DOCUMENT ROADMAP

This document serves as the **Final Environmental Impact Assessment (EIA) Report** for the proposed Limpopo Central Hospital, situated in the Limpopo Province.

In order to provide clarity to the reader, a document roadmap is provided in **Table 1** below. The document roadmap provides information on the requirements of the 2014 EIA Regulations, as amended (07 April 2017), as stipulated in Appendix 3 of Government Notice (GN) No. R. 982, as promulgated in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998) as well as a guide on the content of each chapter.

Please note that in some cases more information is provided than required in the EIA Regulations, in which case there will be no correlating section to the EIA Regulations.

Table 1: EIA Report Roadmap

Chapter	Title	Correlation with Appendix 3 of GN No. R. 982	
1	Document Roadmap	–	–
2	Purposed of this Document	–	–
3	Environmental Assessment Practitioner (EAP)	3(1)(a)	Details of- (iii) the EAP who prepared the report; and (iv) the expertise of the EAP, including a curriculum vitae.
4	Project Background and Motivation	–	–
5	Project Location	3(1)(b)	The location of the development footprint of the activity on the approved site as contemplated in the accepted Scoping Report, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.
		3(1)(c)	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is - (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; and

Chapter	Title	Correlation with Appendix 3 of GN No. R. 982	
			(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.
6	Project Alternatives	3(1)(g)	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.
		3 (1)(h)	(i) Details of the development footprint alternatives considered; (ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such.
7	Project Description	3(1)(d)	A description of the scope of the proposed activity, including- (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development.
8	Legislation and Guidelines Considered	3(1)(e)	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.
9	Scoping and EIA Process	3(1)(u)	An indication of any deviation from the approved scoping report, including the plan of study, including- (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation.
		3(1)(v)	Any specific information that may be required by the competent authority.
10	Assumptions and Limitations	3(1)(p)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.
11	Need and Desirability	3(1)(f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted Scoping Report.
12	Timeframes	3(1)(r)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded, and

Chapter	Title	Correlation with Appendix 3 of GN No. R. 982	
			the post construction monitoring requirements finalised.
13	Financial Provisions	3(1)(t)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.
14	Profile of the Receiving Environment	3(1)(h)(iv)	The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
15	Summary of Specialist Studies	3(1)(k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.
16	Impact Assessment	3(1)(h)(v)	The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated.
		3(1)(h)(vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.
		3(1)(h)(vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
		3(1)(h)(viii)	The possible mitigation measures that could be applied and level of residual risk.
		3(1)(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including - (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and

Chapter	Title	Correlation with Appendix 3 of GN No. R. 982	
			(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.
		3(1)(j)	An assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated.
17	Analysis of Alternatives	3(1)(h)(x)	A concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted Scoping Report.
		3(1)(n)	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment.
18	Public Participation	3(1)(h)	(ii) Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs. (iii) A summary of the issues raised by IAPs, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.
19	EIA Conclusions and Recommendations	3(1)(l)	An environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and

Chapter	Title	Correlation with Appendix 3 of GN No. R. 982	
			(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.
		3(1)(m)	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the Environmental Management Programme (EMPr) as well as for inclusion as conditions of authorisation.
		3(1)(o)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.
		3(1)(q)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.
20	Oath of Environmental Assessment Practitioner	3(1)(s)	An undertaking under oath or affirmation by the EAP in relation to: <ul style="list-style-type: none"> (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and Interested and Affected Parties (IAPs); (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to IAPs and any responses by the EAP to comments or inputs made by IAPs.
21	References	-	-
	N/A	3(1)(w)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.

The following is included in the Appendices to meet the requirements of the 2014 EIA Regulations, as amended:

Appendix	Title	Correlation with GN No. R. 982
E	Specialists Studies	Appendix 6
H	Environmental Management Programme (EMPr)	Appendix 4

2 PURPOSE OF THE DOCUMENT

Nemai Consulting was appointed by Sakhwi Health Solutions, on behalf of the National Department of Health, as the independent Environmental Assessment Practitioner (EAP) to undertake the environmental assessment for the proposed Limpopo Central Hospital.

To date, the Scoping phase of the overall environmental assessment for the project has been completed. The Final Scoping Report and Plan of Study for the EIA were approved by the Department of Environment, Forestry and Fisheries (DEFF) (previously Department of Environmental Affairs) on **01 October 2019** (Refer to **Appendix B**). This allowed for the commencement of the EIA phase.

According to GN No. R. 982 of the 2014 EIA Regulations, as amended, the objective of the EIA process is to undertake the following, through a consultative process:

- ❖ Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- ❖ Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted Scoping Report;
- ❖ Identify the location of the development footprint within the approved site as contemplated in the accepted Scoping Report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- ❖ Determine the –
 - Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - Degree to which these impacts -
 - Can be reversed;
 - May cause irreplaceable loss of resources; and
 - Can be avoided, managed or mitigated;
- ❖ Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted Scoping Report based on the lowest level of environmental sensitivity identified during the assessment;
- ❖ Identify, assess, and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
- ❖ Identify suitable measures to avoid, manage or mitigate identified impacts; and
- ❖ Identify residual risks that need to be managed and monitored.

3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

In accordance with Section 3 (1)(a) of Appendix 3 of GN No. R. 982 of the 2014 EIA Regulations (as amended), this section provides an overview of Nemaï Consulting and the company's experience with EIAs, as well as the details and experience of the EAPs that form part of the Scoping and EIA team.

Nemaï Consulting is an independent, environmental, social development and Occupational Health and Safety (OHS) consultancy, which was founded in December 1999. The Company is directed by a team of experienced and capable environmental engineers, scientists, ecologists, sociologists, economists and analysts. The company has offices in Randburg (Gauteng) and Durban (KZN).

The core members of Nemaï Consulting that are involved with the Scoping and EIA Process for the proposed development are captured in **Table 2** below, and their respective Curricula Vitae are contained in **Appendix I3**.

Table 2: Scoping and EIA Core Team Members

Name	Qualification	Responsibility
Mr. D. Henning	MSc. River Ecology	<ul style="list-style-type: none"> • Project Manager • Quality Review
Mrs J. Davis	BSc. Hons – Geography	<ul style="list-style-type: none"> • EIA Process
Mr. C. van der Hoven	BSc. Hons – Environmental Sciences	<ul style="list-style-type: none"> • EIA Process • Public Participation

4 PROJECT BACKGROUND AND MOTIVATION

4.1 National Development Context

The South African Government adopted a National Infrastructure Plan in 2012 that intends to transform our economic landscape while simultaneously creating significant numbers of new jobs, and to strengthen the delivery of basic services. The plan also supports the integration of African economies. The National Infrastructure Plan consists of 18 Strategic Integrated Projects (SIPs) which have been approved by the Presidential Infrastructure Coordinating Commission (PICC) to support economic development and service delivery in all provinces.

As part of the social infrastructure SIPs, SIP 12: Revitalisation of public hospitals and other health facilities, aims to build and refurbish hospitals, other public health facilities and revamp 122 nursing colleges. The SIP contains major builds for six hospitals, and extensive capital expenditure to prepare the public healthcare system to meet the requirements of the National Health Insurance (NHI) system. Major infrastructure projects under the health sector associated with this SIP include the construction of the proposed Limpopo Hospital.

4.2 Background to the proposed development of the Limpopo Central Hospital

The Limpopo Central Hospital Feasibility Report (Sakhiwo, 2018) indicated that public health infrastructure is a fundamental pillar to building a successful national health insurance programme. However, according to the National Service Delivery Agreement, the current public health infrastructure cannot adequately support the service delivery needs of the country. Health facility planning, including providing new hospitals and clinics and upgrading established facilities, needs to be expedited to increase citizen's access to a high standard of health care facilities. The fact that there is a significant shortage of skilled practitioners and health care workers in South Africa exacerbates the situation. Currently, the existing medical schools are unable to produce the requisite number of health professionals. If the country is to meet the requirements of the NHI goals of more equitable access to high-quality health services for all South Africans, both the academic component and health service provisioning must be improved.

In 2008/9, strategic analysis identified the need to develop a new 630 bed academic hospital in the Limpopo Province to meet the operational obligations of the Limpopo Department of Health and Social Development (DHSD) following which, in 2010, both the business case and health brief were approved by the Limpopo Department of Health and the National Department of Health. Planning for the new central hospital, based on the identified needs, commenced. This included a masterplan of the new hospital on the new identified site donated by the local municipality as well as 1:200 concept designs. When the Minister of Health announced in 2011 that five flagship academic hospitals are to be managed and planned for by the National Department of Health, the Limpopo Academic Hospital in Polokwane was one of these five

hospitals. The programme for these new academic hospitals was subsequently transferred to the National Department of Health (DoH), under which authority all academic hospitals reside. At this point, transactional advisors (TA) were appointed to independently investigate a Public Private Partnership (PPP) funding model to finance separately, each of the new hospitals.

The outcome of the feasibility study for the Limpopo Academic Hospital, managed by the TA, was a proposed project scope that included the procurement of a new 580 bed academic hospital in Polokwane on a greenfield site, as well as the provision of doctors' and nurses' accommodation. Oncology services were to remain at Pietersburg Hospital and Ophthalmology at Mankweng Hospital (both providing these currently as tertiary level services). However, the PPP model was ultimately considered unfeasible in 2013 and it was not until 2015/16 that the project planning process recommenced (still under the auspices of National Department of Health) for the new central hospital. The subsequent draft 10 Year Infrastructure Plan for Health Services (10YIP) (2016), initiated by the DoH, and the National Tertiary Health Services Plan (NTHSP) reports necessitated a review of the provision of Level 1, 2 and 3 (tertiary) services in Limpopo with specific reference to the new academic hospital in Polokwane. A new review process was initiated inclusive of a need analysis and strategic planning, option analysis and procurement option analysis to determine affordability of the preferred options and procurement model.

Currently only 242 of the required 688 L3 beds are provided in the province of which 187 are at Pietersburg hospital and 55 are at Mankweng Hospital. While over the past 25 years the Limpopo Health Department has expanded its capacity in an attempt to provide tertiary health care, Limpopo has historically been dependent on hospitals in Gauteng for tertiary services particularly Dr George Mukhari and Steve Biko Hospitals and, in recent years, Charlotte Maxeke and Chris Hani Baragwanath Hospitals. A new clinical service plan for increased tertiary services in the province is therefore motivated for to address this need inclusive of the provision for sub specialties in surgery and medicine, obstetrics and gynaecology, paediatrics and neonatology, critical care and emergency medicine. The most important clinical service need being maternal and child care, trauma management and oncology.

4.3 Options Analysis

Infrastructure and how best the proposed tertiary health services can be accommodated physically in a functional layout to support the clinical needs, was reviewed in four separate options under the Options Analysis. These options were initially considered in the Business Case then reviewed in the feasibility study conducted for the PPP option in 2013, and were then reviewed again in the latest feasibility report:

- ❖ Option 1: Consolidated specialist services – reconfiguration of existing hospital, no new hospital;
- ❖ Option 2: Split specialist services and build a new 488-bed academic hospital;
- ❖ Option 3: New 688 bed academic hospital; and

❖ Option 4: Do nothing – no change

In the feasibility report, the four options were quantified and evaluated and the advantages and disadvantages per option were considered. The options were compared in detail with respect to compliance, service delivery, academic teaching space, site constraints, departmental adjacencies, future expansion, functionality, flow, access, human resource efficiencies, management structure, construction and construction methods, cost and timelines. Refer to **Section 6.1** for further details of the Options Analysis undertaken.

4.4 Preferred Option

There has been overwhelming evidence of the need for a comprehensive tertiary care facility in Limpopo since 1994. The need has only increased with provincial population growth and increasing pressure on Gauteng tertiary facilities, struggling to accommodate that province's own growth. The Limpopo population's demand for services is unlikely to be vastly different from that of Gauteng, which has 10 times more tertiary beds per dependent population than Limpopo. Even with optimal staffing at district and regional hospitals there is a definite need for the planned 488 L3 new hospital. The limiting factor will be the ability to attract medical specialists (and appropriate specialist nurses), a challenge which will be facilitated greatly by a well-staffed medical school in Polokwane.

Additional to the immediate health benefit to the provincial population, the new Limpopo Central Hospital will be a positive contribution not only to the Limpopo Province but to the country, stimulating the economy both on a macro and micro level. Benefits will be in the form of employment opportunities, especially locally; the provision of goods and services; improvement of the skills of the students passing through the Medical School who, by virtue of their increased earning power, improved economic activity; improving the number of health professionals in the region thereby improving the health of the people in that region which, in turn, due to its focus on preventive practice, reduces the burden of disease and the associated drain on the fiscus. This should particularly affect the maternity and neonatal mortality rates which in itself will increase longevity and the added benefits to the economy. The estimated total annual operational expenditure of approximately R1.3 billion, could create an additional R2.3 billion in new business sales, R0.9 billion in additional GGP, as well as 2 917 sustained employment opportunities.

The Feasibility Report (Sakhiwo, 2018) concluded that **Option 2: Split specialist services and build a new 488-bed academic hospital** be selected as the preferred option due to it carrying the least risks, being the most cost-efficient option, and it has the shortest timelines of all the compared options. This option was therefore assessed further in this report.

5 PROJECT LOCATION

5.1 Geographical Context

The proposed Limpopo Central Hospital is situated within the Limpopo Province. The proposed project footprint falls within the jurisdiction of the Capricorn District Municipality (DM), and the Polokwane Local Municipality (LM). Refer to **Figure 1** below.

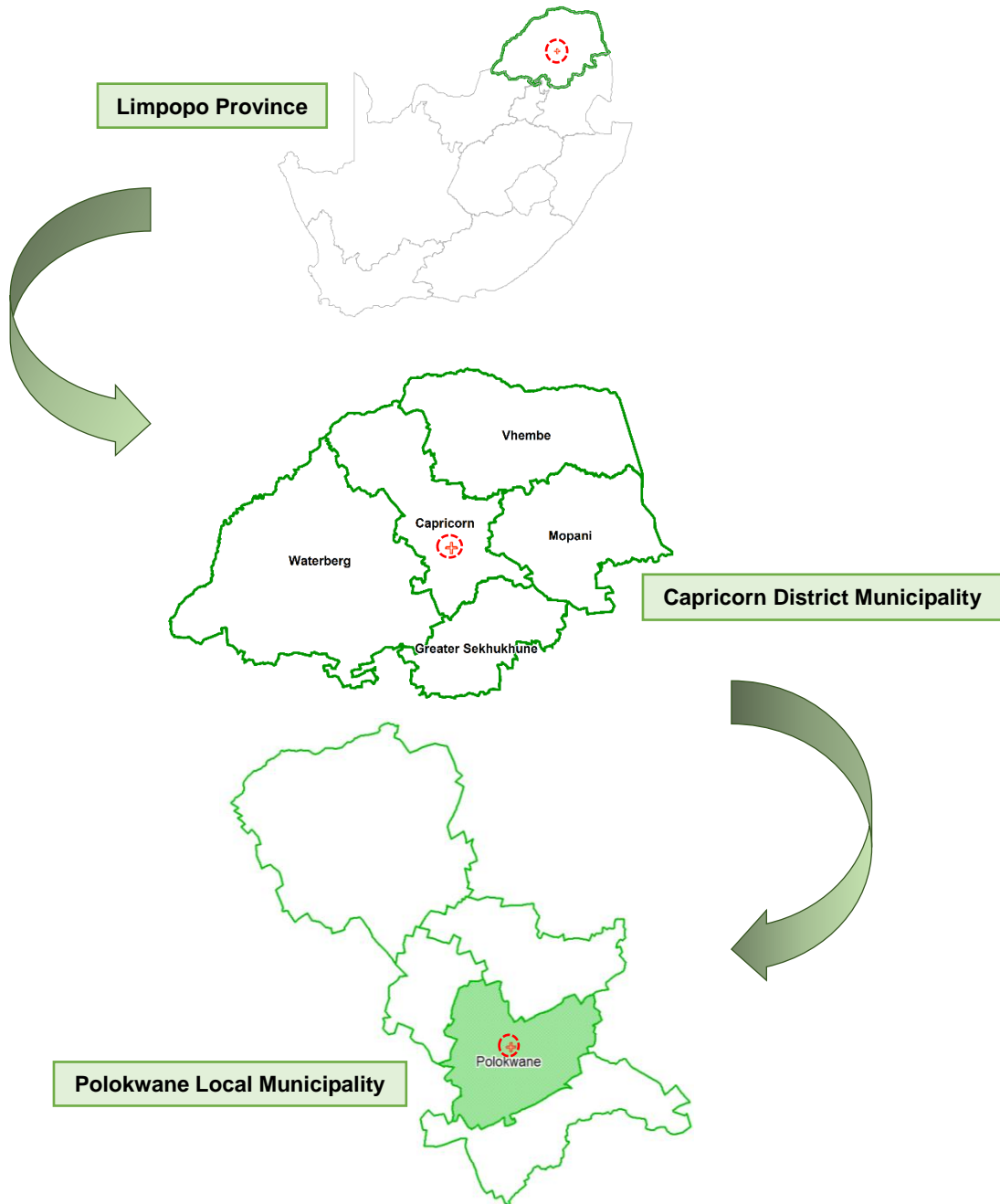


Figure 1: National, provincial and municipal map

5.2 Proposed Site

The proposed Limpopo Central Hospital site is situated between Edupark, the Northern Academy Secondary School and the N1 road. The proposed site is approximately 21 ha in extent and is situated on the Remainder of Erf 6861 of Pietersburg Extension 30.

Refer to **Figures 2 - 4**. Locality maps of the site are also contained in **Appendix A**.



Figure 2: Cadastral map (based on 2017 cadastral information)

The proposed site is situated to the north of the N1 (Polokwane Bypass), south of Suid Street and to the east of Webster Street. Refer to **Figure 3** for on-site photographs.



Figure 3: On-site Photos



Figure 4: Google Earth locality map

6 PROJECT ALTERNATIVES

The 2014 EIA Regulations (as amended) require that feasible project specific alternatives are identified (including the “do nothing” option). The Regulations define alternatives as the following:

Different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- ❖ *Property on which or location where the activity is proposed to be undertaken;*
- ❖ *Type of activity to be undertaken;*
- ❖ *Design or layout of the activity;*
- ❖ *Technology to be used in the activity; or*
- ❖ *Operational aspects of the activity; and*
- ❖ *Includes the option of not implementing the activity.*

In terms of the 2014 EIA Regulations (as amended), the fundamental purpose of the EIA Process is the consideration of viable and reasonable alternative sites, processes, and technologies of achieving the objectives of the project. The sub-sections to follow discuss the project alternatives previously considered during the feasibility stage of the project and provide motivation as to why no alternatives were considered for the Scoping and EIA Process for the proposed Limpopo Central Hospital project.

6.1 Options Analysis

Options considered during the Feasibility Study (refer to **Appendix I1**) are discussed in this section. Infrastructure and how best the proposed tertiary health services can be accommodated physically in a functional layout to support the clinical needs, was reviewed in four separate options. These options were initially considered in the Business Case, then reviewed in the feasibility study conducted for the PPP option in 2013, and were then reviewed again in the latest feasibility report:

Option 1: Consolidated specialist services – reconfiguration of existing hospital, no new hospital.

1. The existing Pietersburg hospital would be upgraded to a central hospital with a limited number of regional beds.
2. Mankweng hospital would be a regional hospital for Capricorn District with limited districts beds to accommodate the local population.

Option 2: Split specialist services and build a new 488-bed academic hospital.

1. A new 488 L3 bed central hospital, Limpopo Central Hospital, to be constructed on the new site;

2. Pietersburg Hospital to become a regional hospital, but still provide some tertiary services (90 x L3 beds). Oncology services to remain at Pietersburg (58 beds) as well as nephrology and urology beds (32 beds) and the renal dialysis unit;
3. Mankweng hospital to become a district hospital with some regional services and limited tertiary beds. The existing 36 Ophthalmology tertiary beds to be remain at Mankweng Hospital.

The total tertiary service component for the Limpopo Academic Complex (not including psychiatry) will be 614 beds, which is less than other estimates.

Option 3: New 688 bed academic hospital.

1. New central hospital, Limpopo Central Hospital, with 688 beds will be built on the new site and will provide all tertiary services in the region;
2. The tertiary beds will be relocated from Pietersburg and Mankweng hospitals.
3. Pietersburg Hospital to become a regional hospital with limited district beds and no tertiary beds;
4. Mankweng hospital to become a district hospital with limited regional beds and no tertiary beds.

Option 4: Do nothing – no change

In the feasibility report, the four options were then quantified and evaluated and the advantages and disadvantages per option were considered. The options were compared in detail with respect to compliance, service delivery, academic teaching space, site constraints, departmental adjacencies, future expansion, functionality, flow, access, human resource efficiencies, management structure, construction and construction methods, cost and timelines.

The feasibility report concluded that **Option 2** be selected as the preferred option due to it carrying the least risks, being the most cost-efficient option, and has the shortest timelines of all the compared options.

6.2 Project Alternatives

6.2.1 Site Alternatives

The Feasibility Report (Sakhiwo, 2018), contained in **Appendix I1**, considered the following criteria in the selection of the current proposed site for the proposed Limpopo Central Hospital:

- ❖ Accessibility from major arterial routes;
- ❖ Proximity to both Pietersburg Hospital and Mankweng Hospital;
- ❖ Developable land/area of 50 hectares;
- ❖ Availability in the short term in order to proceed with planning well knowing that the site will have the right zoning and costs;
- ❖ Certainty of tenure of the land; and

❖ Title deed restrictions.

The current proposed site was selected as the most feasible option due to the following reasons:

- ❖ There do not appear to be any restrictive conditions that exist in the title deed to prohibit the development of the proposed hospital;
- ❖ The new site selected is partly developed, where a section is used for the Edupark Campus incorporating the Business School of the University of Limpopo. The remaining area is considered both to be large enough and to offer significant benefits for use for the Academic Hospital Complex (an amalgamation of the new school of medicine and the new central hospital).
- ❖ The site is currently owned by the Municipality of Polokwane who have resolved to donate the sites for the purpose of the Medical School and an Academic Hospital. The University of Limpopo have already taken transfer of the portion for the medical school. The process for the entering into the Deed of Donation and transfer of the Academic Hospital and accommodation portion to the Limpopo Department of Public Works, has commenced;
- ❖ The current zoning of the site allows for the development of the Academic Hospital;
- ❖ The proposed new central hospital was identified as the highest development priority for the Limpopo Province as there is a growing need for services in the area. Polokwane is the capital of Limpopo and is acting as a major service centre for its urban population, surrounding areas and the whole of Limpopo Province;
- ❖ No restrictive conditions exist that prohibit the development of the proposed central hospital, medical school and student residences. In terms of the Polokwane Municipality's Town Planning Scheme, the building height limit is 5 storeys, the maximum coverage is 60%, and the bulk is limited to the site area. The minimum number of car parking spaces is 8/100m² of Gross Leasable Floor area. A building setback of 16.0m exists along the national (N1) road boundary and a 3.0m building setback along Edupark Avenue. The concept design indicates that the hospital will be compliant with these restrictions;
- ❖ The site that has been earmarked for the development of a new hospital, is currently a greenfield vacant piece of land, and is available for the new hospital development; and
- ❖ A previous Draft Scoping Report for the Limpopo Academic Hospital was conducted in 2010 (LDEDET Ref: 12/1/9-7/2-C53). The environmental assessment did not identify any fatal flaws. The report considered and assessed six alternative hospital sites in and around Polokwane. The report concluded that the current proposed site was preferred due to the following factors:
 - Access is considered excellent for vehicular transport from all directions except direct access from the West, but access from the West can still be fairly easy via the arterials.
 - The site is ideally situated in terms of proximity to both the Pietersburg Hospital (via Dorp Street) and Mankweng hospital being on the R71 approximately 25km away.

- The entire site (excluding the portion allocated to Edupark and the school, is developable. The developable area is in the order of 53 hectare.
- The land is currently zoned for Educational purposes. The land is not agricultural zoned and is within the urban edge of Polokwane.
- The site belongs to the Polokwane Local Municipality and has already been offered to the Department of Health for purposes of the Limpopo Academic Hospital.

No site alternatives were therefore assessed further as part of this Scoping and EIA Process, as the current proposed site was found to be the most feasible site and was selected to proceed with the detailed design for the hospital.

6.2.2 Layout Alternatives

Three different layouts for the proposed site were previously prepared (**Appendix I2**), namely:

- ❖ **Site Layout 1** – dated 2018/11/02 indicating a facility with a separated Oncology Unit, Trauma Centre approached from the north, open staff parking areas and a separate entrance to the Oncology Unit.
- ❖ **Site Layout 2** – dated 2018/12/07 indicated the same as above, except the Mother and Child Hospital was placed separately on the northern side of the main buildings. The Trauma Centre was situated between the latter and the main entrance. This layout was accepted by the Standard for Infrastructure Procurement and Delivery Management (SIPDM) Gate 4 with recommendations.
- ❖ **Site Layout 3** – dated 2019/02/15 incorporates the recommendation of SIPDM Gate 4. Site Layout 3 was preferred as this layout design was deemed acceptable as it has been updated with the recommendations of SIPDM, and has been preliminary approved by the DoH.

Consequently, the only alternatives that were thus considered as part of this Scoping and EIA Process, were the preferred site layout and the no-go alternative.

Refer to **Figure 6** and **Appendix C** for the site layout.

6.3 No-go Alternative

The 'no-go' alternative refers to a situation where the proposed development is not built. This would mean that the area where the proposed Limpopo Central Hospital is to be located would not change in any way, and that the environmental conditions within the site would generally stay the same.

To do nothing means that the status quo would remain the same, i.e.:

- ❖ The referral system will be dysfunctional and there will continue to be an under provision of both regional and tertiary beds/services in the province.
- ❖ Patients will still be referred out of the province where the required tertiary services are not available and they will have to compete with patients from other provinces for beds as

Mpumalanga refers to Limpopo hospitals adding continued strain on the resources as there are insufficient Level 2 (L2) and Level 3 (L3) beds;

- ❖ The fees expended to date will be fruitless expenditure;
- ❖ The teaching platform will be incomplete as the full spectrum of services will not be supplied. This will be exasperated by the fact that the state of the tertiary hospital in Pietersburg, is in a poor condition and outdated. Major upgrade to this facility is essential;
- ❖ The province will continue to experience a lack of key specialists as working conditions continue to be inadequate and in a poor condition;
- ❖ The risks will continue without sufficient resources in place; and
- ❖ There will be no local labour/SMME employment opportunities or skills development during the construction phase.

7 PROJECT DESCRIPTION

7.1 Project Scope

The information presented in this section was primarily sourced from the Feasibility Report (Sakhiwo, 2018). The proposed project consists of the building of a new 488 bed central hospital, the Limpopo Central Hospital, on a new site in Polokwane that will provide tertiary care for the province, and which will be the major teaching hospital for the University of Limpopo Faculty of Health Sciences and School of Medicine.

There will be provision for the following at the new facility:

- ❖ 488 beds clinical care capacity for a wide range of highly specialised care;
- ❖ Mostly arranged in 28 bed wards (comprising some single-bed, double-bed, four bed and six bed units);
- ❖ Specific intensive care units (ICU) and high care (HC) layouts;
- ❖ Maternal and child health (MCH) (Paediatrics and Obstetrics & Gynaecology) will be consolidated on the site separate to the adult component but sharing clinical and hospital support services;
- ❖ A mother's lodge (capacity of 24);
- ❖ A pregnant mother's lodge (capacity of 18);
- ❖ Transit – waiting (capacity of 12); and
- ❖ Day procedure beds (capacity of 12).

There will be support for a complete tertiary clinical care and academic complex core teaching capacity, comprising of a 488 x L3 beds at Limpopo Central Hospital delivering Provincial Tertiary Services (T1) and Central Referral Services (T2) care in most major clinical disciplines.

The new hospital would provide a full service supported by the required hospital and clinical support services:

- ❖ Clinical spaces
 - 488 x L3 inpatient beds inclusive of intensive care and high care facilities
 - A polytrauma unit;
 - Operating theatres for each discipline;
 - Day surgery theatres;
 - Out-patient department and specialist clinics;
 - Associated services;
 - Laboratories, in particular National Health Laboratory Services and South African National Blood Services;
 - Diagnostic Radiology;
 - Pharmacy;
 - Central Sterile Service Department; and

- Mortuary.
- ❖ Hospital support services
 - Facilities Management Services;
 - Kitchen;
 - Laundry;
 - Security;
 - Hazardous and household waste storage facilities;
 - Porterage;
 - Bulk Services;
 - Cleaning;
 - Grounds and gardens maintenance service;
 - Clinical and hospital engineering workshops;
 - Transport;
 - Workshops;
 - Information and communication technology;
 - Waste management;
 - Telephone services;
 - Courier and mail service;
 - Reprographics services;
 - Building and estate maintenance service;
 - Accommodation management;
 - Fleet management
- ❖ Administration facilities;
- ❖ Substation, emergency generators and bulk diesel tanks;
- ❖ Parking, site roads and public transport;
- ❖ Solar farm and additional parking; and
- ❖ Staff accommodation (future phase).

The proposed hospital will consist of a lower ground floor, and 3 higher floors (refer to the floor concept designs as provided in **Figures 7 – 10**):

- ❖ The ground floor riding over the lower ground floor, will have the major clinical support and services support functions.
- ❖ The major block on the south-east accommodates main entrance, oncology and outpatients' functions, ICU's, central administration and academic hub.
- ❖ Ward blocks are strung out along the clinical corridor serviced from the back and have visitor access on the front.
- ❖ Specialized facilities service the hospital and are located opposite wards, comprising a theatre complex, specialist day procedure suites, pharmacy, laboratory, burns unit and specialized radiology functions.
- ❖ Extensive parking for visitors, outpatients and staff is provided on lower ground floor and ground floor, and appropriate plant rooms serve the building throughout.

The proposed hospital will also require bulk services (electrical, water and sewer etc.). Refer to **Section 7.3** for a description of the resources required for the construction and operation of the proposed hospital.

Refer to **Figure 5** below for 3D perspective views of the proposed Limpopo Central Hospital. Refer to **Figure 6** for the latest master plan of the proposed site.



Figure 5: 3D perspective views of the Proposed Limpopo Central Hospital



Figure 6: Site Layout

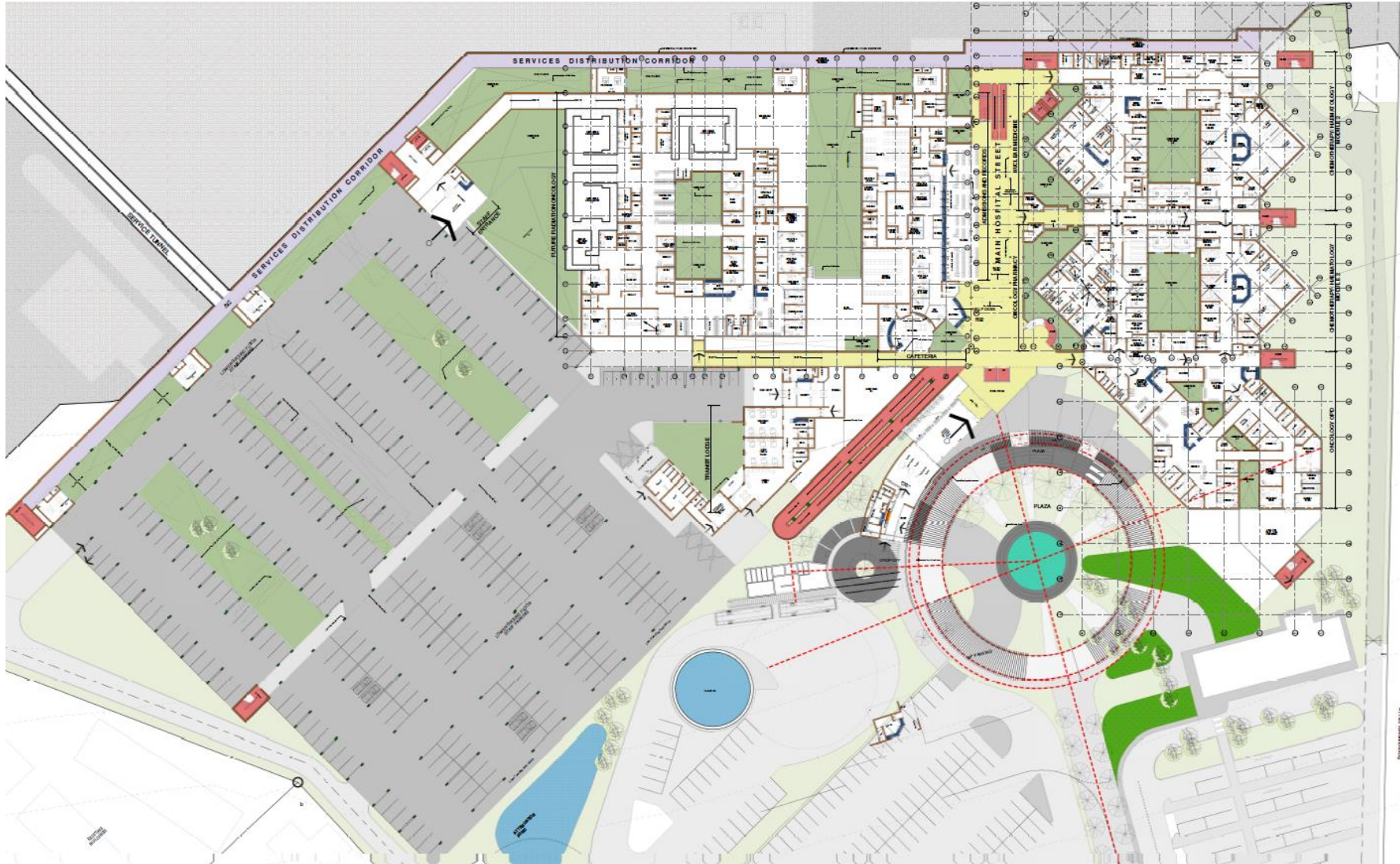


Figure 7: Lower ground floor concept design



Figure 8: Ground floor concept design



Figure 9: First floor concept design

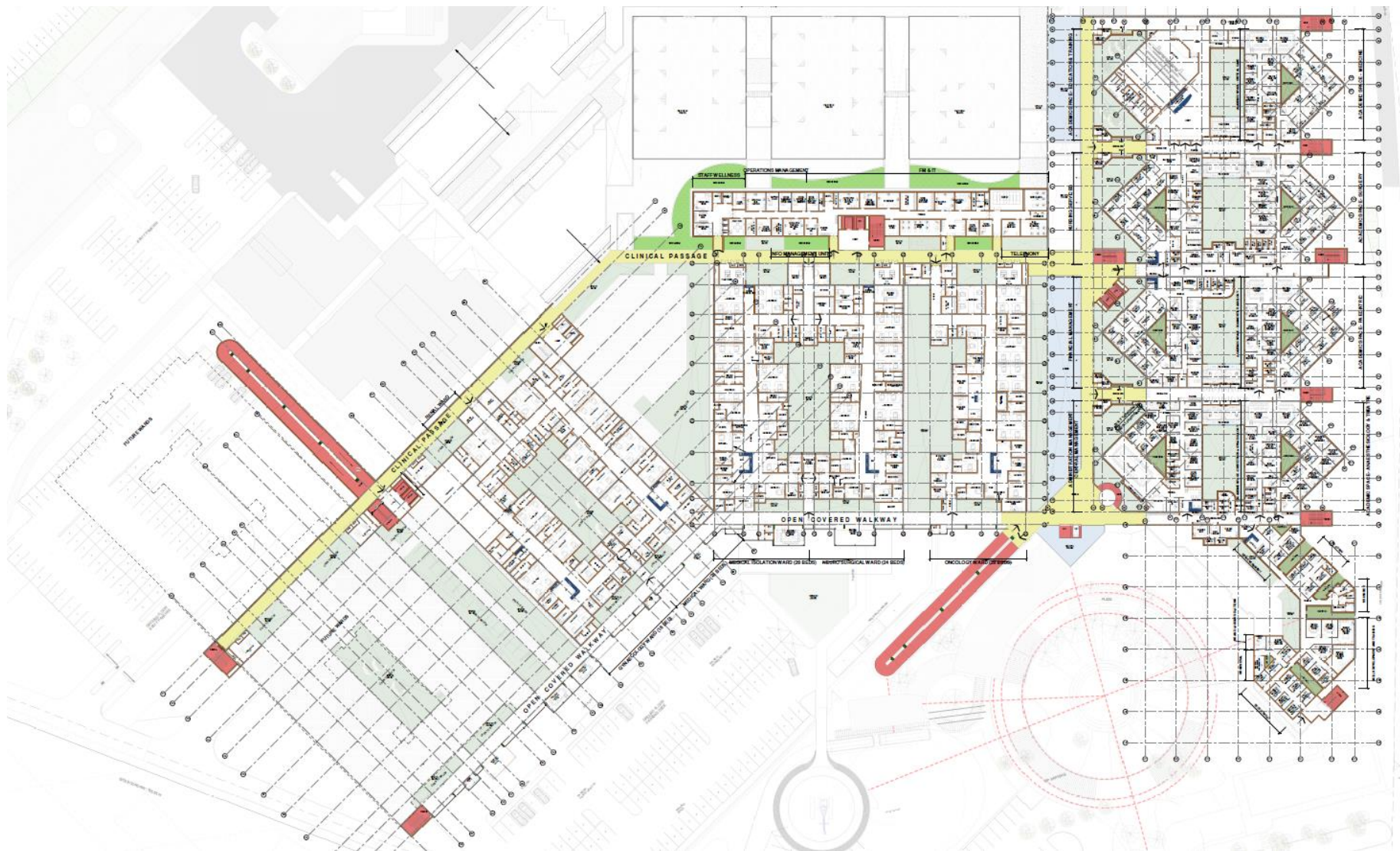


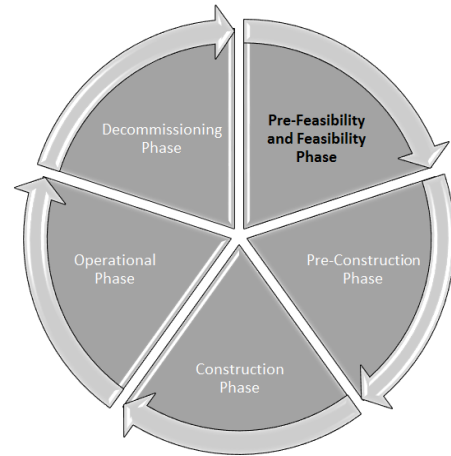
Figure 10: Second floor concept design

7.2 Project Life-Cycle

The project life-cycle for the proposed Limpopo Central Hospital includes the following primary activities:

Feasibility Studies

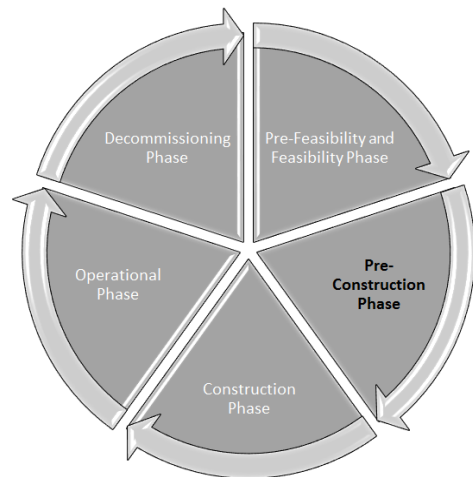
This includes selecting a suitable location for the hospital site.



Pre-Construction

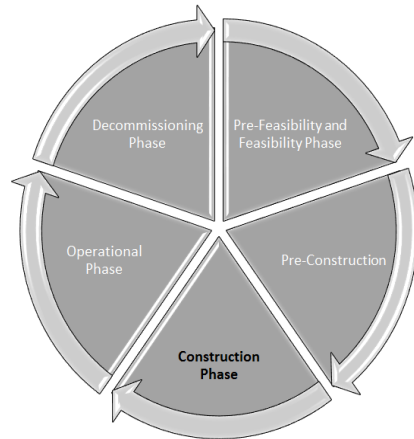
This phase, which can only be undertaken if environmental authorisation is obtained, includes the following –

- Survey of the site;
- Selection of the most appropriate structures;
- Environmental specialists (e.g. ecologist, heritage) conduct a pre-construction survey to determine the exact locations of the sensitive features, based on sensitive environmental features and technical criteria; and
- Preparation of relevant planning documentation, including technical and design documentation.



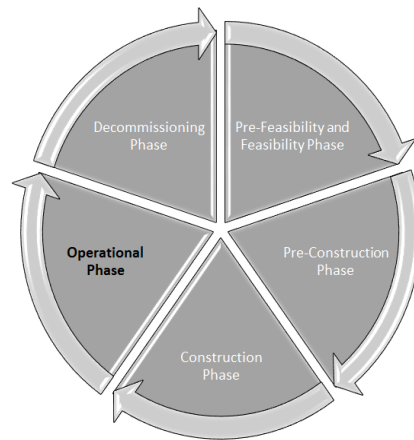
Construction

During the implementation of the project, the construction activities related to the installation of the necessary infrastructure, equipment, and services, is undertaken.



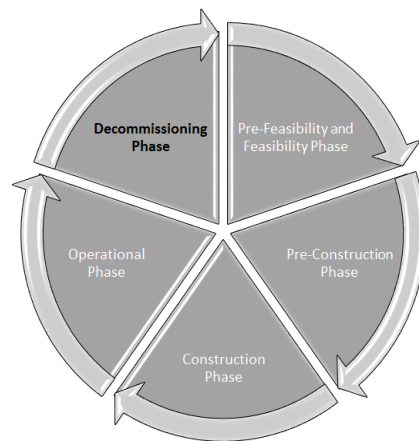
Operation

This includes operational activities associated with the use and operation of the hospital.



Decommissioning

This includes activities associated with the decommissioning of the hospital.



The sub-sections to follow provide an overview of key activities during selected phases of the project life-cycle.

7.2.1 Construction Phase

The construction period of the proposed Limpopo Central Hospital will take approximately 60 months and will involve the following activities:

- ❖ Fencing off of the entire construction domain;

- ❖ Fencing off / marking of protected fauna and heritage resources as per the recommendations stipulated in the specialist studies;
- ❖ Vegetation clearance of the site, which involves the removal of topsoil, and topsoil/spoil stockpiling;
- ❖ Site establishment, such as construction camps, laydown and storage areas on site;
- ❖ Installation of foundations and construction of the required lower ground floor, ground floor, first floor and second floor;
- ❖ Installation of the hospitals' clinical spaces and supporting services;
- ❖ Construction of dedicated internal access roads and parking areas for staff and visitors;
- ❖ Installation of a service road leading to the lower ground floor for deliveries and service/supporting units;
- ❖ Installation of administration facilities;
- ❖ Installation of bulk services (water, sewer, power supply), storage facilities (including general and hazardous waste) and stormwater management infrastructure; and
- ❖ Landscaping and rehabilitation of the site and construction site camp.

7.2.2 Operational Phase

The key tasks during the operational phase for the proposed development include the following:

- ❖ Operation of the Limpopo Central Hospital;
- ❖ Stormwater management; and
- ❖ Waste Management.

7.3 Resources Required for Construction and Operation

This section briefly outlines the resources which will be required in order to execute the construction and operation of the proposed Limpopo Central Hospital (Civil Engineering Services Report, 2019).

7.3.1 Water

7.3.1.1 Connection to the existing external system:

An existing 315mm diameter (Ø) class 12 uPVC main is located on the eastern side of Webster Street and runs along the western boundary of our site. In addition, an existing bulk steel water main runs on the south-western boundary of the erf which feeds to two stadiums at the Peter Mokaba sports complex. The Polokwane Municipality has confirmed that based on the estimated water requirements, the new hospital will be able to connect and be fed from the existing 315mmØ class 12 uPVC main running along Webster Street on the western boundary of the site. The existing 315mmØ main has both sufficient capacity and pressure to satisfy the needs of the Hospital Development.

7.3.1.2 Internal distribution system:

The proposed development will be provided with 160mmØ Class 12 water mains which will feed a firewater reservoir of 250kl and a domestic water reservoir of 548kl respectively. Water will then be reticulated from this reservoir by means of a combined 110mmØ uPVC Class 16 domestic and fire main for reticulation within the building. A separate 110mmØ Class uPVC Class 16 main will be provided to feed the external fire hydrants. Pumps and tanks will be provided to maintain the required pressures and flows.

7.3.2 Sanitation

7.3.2.1 Internal Sewer Network:

The internal sewer network will be water borne gravity sanitation system. Main sewer lines will be 160mmØ uPVC pipes (Class 34) with 110mmØ building connections. The main collector line which will tie into the main municipal connection will be a 250Ø Class 34 uPVC main.

7.3.2.2 Connection to external sewer network:

The main outfall sewer line will connect to the site sewer network at the north-western corner of the hospital site. From this point it will cross Webster Street and run along the western side of Webster Street within the road reserve. At South Street it will cross the stormwater channel via the road reserve and on top of the existing stormwater culverts under the road, and will then follow the southern boundary of South Street up to existing Manhole No. 307, where it will tie into the existing 525Ø Class 50D municipal main. A meeting was held with municipal officials and it was confirmed that connecting at this point would be in order. Refer to technical drawings of the proposed sewer pipeline in **Appendix C**.

7.3.3 Power Supply

The main power supply to the site shall be obtained from the Beta substation located in Suid Street. Sufficient capacity is available in this substation to allow for a 12MVA connection to the site. Power shall be fed to the site via suitably sized cables at 11kV from a substation that needs to be constructed on the site boundary from where an internal 11kV ring will be constructed to feed both the hospital building as well as all the other future developments on site. The initial estimated load for the hospital building alone is 6MVA. This will be refined and recalculated during the design development phase. Refer to technical drawings of the proposed substation in **Appendix C**.

The power cables required which will start from the Beta Substation on Suid Street, will be installed underground within the existing road servitudes all the way to the proposed site (see **Figure 11**). The proposed route crosses a watercourse via an existing bridge, and crosses a stormwater channel via an existing stormwater culvert. It is assumed that no excavation will be required within a watercourse, as the cable will be installed within sleeves fixed to the existing concrete bridge and stormwater culvert.



Figure 11: Proposed Power Supply 11kV Cable Route from the Beta Substation to the Proposed Site

7.3.4 Stormwater Management

The internal stormwater network will be a combination of open channels and an underground piped culvert system. Rainwater harvesting and the use of stormwater infiltration trenches to re-charge underground water levels will be employed where possible. A stormwater attenuation pond is proposed for the development to attenuate the peak flows to the same pre-development run-off levels. An outlet structure will be constructed at the entrance to the development and stormwater from the development will be discharged into the existing concrete lined V-drain situated at the entrance to the development on the eastern side of Webster Street. The outlet structure of the pond will be designed such that this will mimic the pre-development flows. The attenuation volume required is 7350m³. The final position and dimensions of the attenuation pond will be determined during detail design. Further provisions for stormwater management on site will be included in the EMP_r as part of the EIA Report.

7.3.5 Waste Management

The construction phase will have the following waste management process:

- ❖ Solid waste generated during the construction phase will be temporarily stored at a suitable location (e.g. at construction camp) and will be removed at regular intervals and disposed of at approved waste disposal sites. All the waste disposed of will be recorded.

- ❖ All storage of general or hazardous waste in a waste storage facility (e.g. onsite waste transfer station) will comply with the national norms and standards (GN R. 926 of 29 November 2013, or as amended). The waste storage facility will be established at the construction camp where waste from site will be collected, sorted, weighed and placed in skips and recycling containers for removal to service providers and appropriate registered landfill sites (hazardous and general sites, as required).
- ❖ Temporary waste storage facilities will remain below the thresholds contained in the listed activities under Schedule 1 of NEM:WA;

The operational phase will have the following waste management process:

- ❖ Medical waste of all categories will be stored securely on site in dedicated rooms for collection by a registered third party, and will then be removed from site. No incineration will be installed on site. The medical waste storage areas will comply with the national norms and standards (GN R. 926 of 29 November 2013, or as amended). The anticipated volume is approximately 15000kg/month.
- ❖ All general and hazardous waste will be temporarily stored at a waste management facility on site, where waste from the hospital will be collected, sorted, weighed and placed in skips and recycling containers, which will then be removed and disposed of by an accredited service provider at appropriate registered landfill sites (hazardous and general sites, as required). The storage areas will comply with the national norms and standards (GN R. 926 of 29 November 2013).
- ❖ Temporary waste storage facilities will remain below the thresholds contained in the listed activities under Schedule 1 of NEM:WA;
- ❖ The proposed hospital is classified as a 'major generator', as it will generate health care risk waste (HCRW) in excess of 20kg per day. The handling and storage of the HCRW, before the collection and removal by an accredited service provider, will comply with the regulations as stipulated in the *National Health Care Risk Waste Management Regulations* (GN No. R.463 of 30 April 2018).
- ❖ A mortuary will be available on site. The operation of the facility will comply with the requirements as specified in the *Regulations relating to the Management of Human Remains* (GN No. R. 363 of 22 May 2013) published in terms of the National Health Act, 61 of 2003.

Further provisions for the management of general and hazardous waste (including HCRW), during the construction and operational phase, are included in the EMP_r (see **Appendix H**).

7.3.6 Access Roads

The proposed site is situated within an urban area with existing roads, thus no new access roads will be required for the construction phase. Access to the proposed site will be via Webster Street and a service entrance from South Street.

7.3.7 Construction Camp

It is anticipated that provision will be made for the following facilities at the construction camps:

- ❖ Concrete batching plant;
- ❖ Soil stockpile area;
- ❖ Materials laydown area;
- ❖ Site offices;
- ❖ Parking;
- ❖ Materials testing laboratory;
- ❖ Workshops and stores;
- ❖ Reinforcing steel bending yard;
- ❖ Areas for the handling of hazardous substances;
- ❖ Wash bays for construction plant;
- ❖ Facilities for the bulk storage and dispensing of fuel for construction vehicles,
- ❖ Ablution facilities; and
- ❖ A waste collection area for off-site disposal.

The construction camp will be located within the proposed site.

7.3.8 Construction Labour

The appointed Contractor will make use of skilled labour where necessary. In instances where casual labour is required, they will be sourced locally as far as possible.

8 LEGISLATION AND GUIDELINES CONSIDERED

8.1 Legislation

8.1.1 Environmental Statutory Framework

The legislation that has possible bearing on the proposed project from an environmental perspective is captured in **Table 3** below. **Note:** *This list does not attempt to provide an exhaustive explanation, but rather represents an identification of the most appropriate sections from pertinent pieces of legislation.*

Table 3: Environmental Statutory Framework

Legislation	Description and Relevance
Constitution of the Republic of South Africa, (No. 108 of 1996)	<ul style="list-style-type: none"> Chapter 2 – Bill of Rights. Section 24 – Environmental Rights.
National Environmental Management Act (NEMA) (No. 107 of 1998)	<ul style="list-style-type: none"> Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). Section 28 – Duty of care and remediation of environmental damage. Environmental management principles. Authorities – DEFF (national) and Limpopo Department of Economic Development, Environment and Tourism (LDEDET) (provincial).
GN No. R 982 of 4 December 2014, as amended	<ul style="list-style-type: none"> Purpose - regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.
GN No. R. 983 of 4 December 2014 (Listing Notice 1) as amended	<ul style="list-style-type: none"> Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment process, as prescribed in regulations 19 and 20 of GN No. R 982 of 4 December 2014. However, according to Regulation 15(3) of GN No. R 982, S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities.
GN No. R. 984 of 4 December 2014 (Listing Notice 2) as amended	<ul style="list-style-type: none"> Purpose - identify activities that would require environmental authorisations prior to commencement of that activity and to identify competent authorities in terms of sections 24(2) and 24D of NEMA. The investigation, assessment and communication of potential impact of activities must follow a Scoping and EIA process, as prescribed in regulations 21 - 24 of GN No. R 982 of 4 December 2014. Activities under Listing Notice 2 that are relevant to this project are provided in Table 4.

Legislation	Description and Relevance
GN No. R. 985 of 4 December 2014 (Listing Notice 3) as amended	<ul style="list-style-type: none"> • Purpose - list activities and identify competent authorities under sections 24(2), 24(5) and 24D of NEMA, where environmental authorisation is required prior to commencement of that activity in specific identified geographical areas only. • The investigation, assessment and communication of potential impact of activities must follow a Basic Assessment process, as prescribed in regulations 19 and 20 of GN No. R 982 of 4 December 2014. However, according to Regulation 15(3) of GN No. R 982, S&EIR must be applied to an application if the application is for two or more activities as part of the same development for which S&EIR must already be applied in respect of any of the activities. • Activities under Listing Notice 3 that are relevant to this project are provided in Table 4.
National Water Act (Act No. 36 of 1998)	<ul style="list-style-type: none"> • Chapter 3 – Protection of water resources. • Section 19 – Prevention and remedying effects of pollution. • Section 20 – Control of emergency incidents. • Chapter 4 – Water use. • Authority – Department of Water and Sanitation (DWS).
National Environmental Management Air Quality Act (Act No. 39 of 2004)	<ul style="list-style-type: none"> • Air quality management • Section 32 – Dust control. • Section 34 – Noise control. • Authority – DEFF.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	<ul style="list-style-type: none"> • Management and conservation of the country's biodiversity. • Protection of species and ecosystems. • Authority – DEFF.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	<ul style="list-style-type: none"> • Protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural landscapes.
National Environmental Management: Waste Act (Act No. 59 of 2008)	<ul style="list-style-type: none"> • Chapter 5 – licensing requirements for listed waste activities - GN No. R. 921 of 29 November 2013. • Authority – Minister (DEFF) or MEC (provincial authority)
National Forests Act (No. 84 of 1998)	<ul style="list-style-type: none"> • Section 15 – Authorisation required for impacts to protected trees. • Authority – Department of Agriculture, Forestry and Fisheries (DAFF)
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	<ul style="list-style-type: none"> • Permit required for borrow pits and quarries. • Authority – Department of Mineral Resources and Energy (DMRE).
Occupational Health & Safety Act (Act No. 85 of 1993)	<ul style="list-style-type: none"> • Provisions for Occupational Health & Safety • Authority – Department of Labour.
National Heritage Resources Act (Act No. 25 of 1999)	<ul style="list-style-type: none"> • Section 34 – protection of structure older than 60 years. • Section 35 – protection of heritage resources. • Section 36 – protection of graves and burial grounds. • Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m² in extent, etc. • Authority – Limpopo Provincial Heritage Resources Authority (LIHRA) and South African Heritage Resources Agency (SAHRA)
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	<ul style="list-style-type: none"> • Control measures for erosion. • Control measures for alien and invasive plant species. • Authority – Department of Agriculture.
National Road Traffic Act (Act No. 93 of 1996)	<ul style="list-style-type: none"> • Authority – Limpopo Department of Public Works, Roads and Infrastructure.

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

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

The Constitution of the Republic of South Africa (Act No. 108 of 1996) is the supreme law of the land and provides amongst others the legal framework for legislation regulating coastal management in general. It also emphasises the need for co-operative governance. In addition, the Environmental clause in Section 24 of the Constitution provides that:

“Everyone has the right –

to an environment which is not harmful to their health or wellbeing;

to have the environment protected for the benefit of present and future generations through reasonable legislation and other measures that:

Prevent pollution and ecological degradation;

Promotes conservation;

Secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development”

The Constitution provides the overarching framework for sustainable development.

8.1.3 National Environmental Management Act (Act No. 107 of 1998)

The proposed development requires authorisation in terms of the National Environmental Management Act (Act No. 107 of 1998) (NEMA), and the EIA will be undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017).

Important aspects of NEMA are sustainability principles such as the “Polluter Pays” and the “Precautionary Principle” which will also be taken into account in the assessment of the impacts of the proposed development.

8.1.3.1 2014 EIA Regulations, as amended (07 April 2017)

The EIA Regulations consist of the following:

- EIA Procedures - GN No. R. 982;
- Listing Notice 1 - GN No. R. 983;
- Listing Notice 2 - GN No. R. 984; and
- Listing Notice 3 - GN No. R. 985.

The proposed Limpopo Central Hospital and associated infrastructure was screened in terms of NEMA, and triggered activities under Listing Notices 2 and 3, and thus needs to be subjected to a Scoping and EIA Process. The Listed Activities are explained in the context of the project in **Table 4**.

Table 4: EIA Listed Activities triggered by the proposed development

GN No. R.	Activity	Description as per GN	Applicability to the Project
984	15	The clearance of an area of 20 hectares or more of indigenous vegetation	The proposed site is approximately 21 Ha in extent and therefore exceeds the threshold of clearing more than 20 ha of indigenous vegetation, triggering this activity.
985	10 (e)(i)	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. e. Limpopo (i) all areas	Dangerous goods (fuel, oil etc.) will be stored on site for construction and operational phases. Emergency generators and bulk diesel tanks will be situated at the substation. Based on initial GBA of approximately 50 000m ² , normal load conditions and 48 hours back-up would require 1 x 16m ³ bulk tank and 1 x 9m ³ unit. The following storage will be required at the main kitchen – 20 x 113L LPG Cylinders, and at the Laundry – 12500L LPG Horizontal Tank. Total combined capacity of 65 m ³ falls within the thresholds and thus triggers this Listed Activity

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

The National Water Act (Act No. 36 of 1998) (NWA) regulates water resources of South Africa. Water is considered a scarce commodity and should therefore be adequately protected. Amongst others, the act deals with the protection of water sources, water uses, water management strategies and catchment management, dam safety and general powers and functions. The purpose of the act is to ensure that South Africa's water resources are protected, used, developed, conserved, managed and controlled. The NWA includes the definition of a Water Resource.

The NWA definition for a Water Resource includes:

1. A Watercourse;
2. Surface Water;
3. An Estuary; and

4. An Aquifer.

The NWA defines a watercourse as follows:

- A river or spring;
- A natural channel in which water flows regularly or intermittently;
- A wetland, lake or dam into which, or from which, water flows; and
- Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse include, where relevant, its bed and banks.

The Act also specifies that a wetland is defined as land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Section 21 of the NWA identifies 11 consumptive and non-consumptive water uses for which authorisation is required. These include:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a watercourse;
- d) Engaging in a stream flow reduction activity;
- e) Engaging in a controlled activity;
- f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;
- i) Altering the bed, banks, course or characteristics of a watercourse;
- j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

The proposed Limpopo Central Hospital and associated bulk services were screened in terms of NWA. The proposed infrastructure is not situated within the regulated area of a watercourse and will thus not trigger Section 21(c) and (i) water uses.

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

The aim of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003) is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and natural seascapes. The purpose of a Protected Environment is amongst others to protect a specific ecosystem outside a special nature

reserve world heritage site or nature reserve and also to ensure the use of the natural resources in the area is sustainable.

The proposed development does not occur near any formal Protected Areas according to the South African National Biodiversity Institute (SANBI). This is discussed further in **Section 14.9**. This Act was considered in the Terrestrial Ecological Assessment (see **Appendix E5**).

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

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) was promulgated for the management and conservation of South Africa's biodiversity through the protection of species and ecosystems and the sustainable use of indigenous biological resources.

The main implication of this Act is the protection of biodiversity. The potential flora and fauna as well as the terrestrial ecosystems will be discussed further in **Section 14.9** and **14.10**. This Act was considered in the Terrestrial Ecological Assessment (see **Appendix E5**).

8.1.7 National Environmental Management: Air Quality Act (Act No. 39 of 2004)

The National Environmental Management: Air Quality Act (Act No. 39 of 2004) provides for the setting of national norms and standards for regulating air quality monitoring, management and control and describes specific air quality measures so as to protect the environment and human health or well-being by:

- Preventing pollution and ecological degradation; and
- Promoting sustainable development through reasonable resource use.

It also includes measures for the control of dust, noise and offensive odours that may be relevant to the construction. No Air Emissions License will be required for the proposed development as no incinerator will be installed on site. The potential impacts of the hospital on air quality will be discussed in **Section 14.13**.

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

The National Environmental Management Waste Act (Act No. 59 of 2008) (NEM:WA) regulates waste management in order to protect the health and environment of South African citizens. This is achieved through pollution prevention, institutional arrangements and planning matters, national norms and standards and the licensing and control of waste management activities.

The latest list of waste management activities that have or are likely to have a detrimental effect (GN No. 921 of 29 November 2013) contains activities listed in Categories A and B that would require licensing from the provincial or national authorities and activities contained in Category C which would require meeting the requirements of various Norms and Standards.

No authorisation will be required in terms of the NEM:WA, as the project will not include any of the listed waste management activities.

The following is noted with regards to waste management for the proposed Limpopo Central Hospital:

❖ Construction Phase –

- The storage of general or hazardous waste in a waste storage facility at the construction camp will comply with the norms and standards in GN No. R. 926 of 29 November 2013;
- Temporary waste storage facilities will remain below the thresholds contained in the listed activities under Schedule 1 of NEM:WA; and
- The Environmental Management Programme (EMPr), in **Appendix H**, makes suitable provisions for waste management, including the storage, handling and disposal of waste;

❖ Operational Phase –

- Medical waste of all categories will be stored securely on site in dedicated rooms for collection by a registered third party, and will then be removed from site. No incineration will be installed on site. The medical waste storage areas will comply with the national norms and standards (GN R. 926 of 29 November 2013, or as amended). The anticipated volume is approximately 15000kg/month.
- All general and hazardous waste will be temporarily stored at a waste management facility on site, where waste from the hospital will be collected, sorted, weighed and placed in skips and recycling containers, which will then be removed and disposed of by an accredited service provider at appropriate registered landfill sites (hazardous and general sites, as required). The storage areas will comply with the national norms and standards (GN R. 926 of 29 November 2013).
- It is assumed that the recycling of general waste (sorting, screening and bailing) at the waste management facility on site, will not have an operational area in excess of 1000 m².
- The Environmental Management Programme (EMPr), in **Appendix H**, makes suitable provisions for waste management, including the temporary storage of general and hazardous waste (including HCRW) on site.

According to the National Health Care Risk Waste Management Regulations (GN No. R.463 of 30 April 2018), the term 'Health Care Risk Waste' (HCRW) means any waste which is produced in the diagnosis, treatment or immunization of human beings or animals, or waste that has been in contact with blood, bodily fluids or tissues from humans, or infected animals from veterinary practices and includes but is not limited to the following categories –

- (a) Infectious waste;
- (b) Pathological waste;
- (c) Laboratory waste;
- (d) Genotoxic waste;

- (e) Sharps waste;
- (f) Chemical waste;
- (g) Pharmaceutical waste; and
- (h) Radioactive waste.

The term 'major generator' means a generator of health care risk waste that generates in excess of 20 kilograms (including weight of the container) per day calculated monthly as a daily average. The proposed hospital is classified as a 'major generator', as it will generate health care risk waste in excess of 20kg per day, and thus the storage and handling of this waste will need to comply with the regulations as stipulated in the National Health Care Risk Waste Management Regulations (GN No. R.463 of 30 April 2018). As a major generator, the hospital will have to register on the South African Waste Information System (SAWIS). In terms of the Regulations relating to Health Care Waste Management in Health Establishments (GN No. R. 375 of 23 May 2014) sub regulation 6(1) states that each health care waste major generator shall have a Health Care Waste Management Plan in place, and the contents of that plan will comply with the aforementioned regulation.

8.1.9 Hazardous Substances Act (Act No. 05 of 1973)

The Hazardous Substances Act (Act No. 05 of 1973) provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products; to provide for the division of such substances or products into groups in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products; and to provide for matters connected therewith.

8.1.10 Occupational Health & Safety Act (Act No. 85 of 1993)

The Occupational Health and Safety Act (Act No. 85 of 1993) provides for the health and safety of people at work as well as the health and safety of persons using plant and machinery.

8.1.11 National Heritage Resources Act (Act No. 25 of 1999)

The National Heritage Resources Act (Act No. 25 of 1999) was promulgated for the protection of National Heritage Resources and the empowerment of civil society to conserve their heritage resources.

The proposed construction of the Limpopo Central Hospital will trigger certain categories as listed below that require a Heritage Impact Assessment in terms of Section 38 of the National Heritage Resources Act. These categories are:

- (a) the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site

(i) exceeding 5 000 m² in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the rezoning of a site exceeding 10 000 m² in extent; or

any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The Act also makes provision for General Protections, which apply automatically to certain categories of heritage resources such as archaeological and paleontological sites, cemeteries and graves, and structures older than 60 years.

Heritage resources in the study area will be discussed further in **Section 14.15**. This Act was considered in the Phase 1 Heritage Impact Assessment (see **Appendix E3**).

8.1.12 Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)

The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) sets out the requirements with which applicants for prospecting rights, mining rights and mining permits must comply to Sections 16, 22 and 27 of the MPRDA.

A Mining Permit will not be required as no borrow pits will be required and all construction material will be commercially sourced.

8.2 Guidelines

The following guidelines were considered during the preparation of the Scoping and EIA Report:

- ❖ Integrated Environmental Management Information Series, in particular Series 2 – Scoping (DEAT, 2002);
- ❖ Guideline on Alternatives, EIA Guideline and Information Document Series (DEA&DP, 2010a);
- ❖ Guideline on Need and Desirability, EIA Guideline and Information Document Series (DEA&DP, 2010b);

- ❖ Integrated Environmental Management Guideline Series 7: Public Participation in the EIA Process (DEA, 2010); and
- ❖ Guidelines for Involving Specialists in the EIA Processes Series (Brownlie, 2005).

8.3 National and Regional Plans

The following regional plans were considered during the execution of the Scoping and EIA Phases (amongst others):

- ❖ District and Municipal Spatial Development Frameworks (SDFs) (where available);
- ❖ District and Municipal Integrated Development Plans (IDPs);
- ❖ Relevant national, provincial, district and local policies, strategies, plans and programmes;
- ❖ Limpopo Provincial Conservation Plan version 2, September 2013;
- ❖ Limpopo Provincial Growth and Development Strategy (PGDS);
- ❖ Limpopo Environmental Management Act (Act No. 7 of 2003);
- ❖ Limpopo Integrated Waste Management Plan, 2016; and
- ❖ Polokwane Local Municipality Waste Management By-Law 2019 (Local Authority Notice 69 of 2019).

9 SCOPING AND EIA PROCESS

9.1 2014 EIA Listed Activities (as amended)

The proposed Limpopo Central Hospital entails certain activities that require environmental authorisation in terms of NEMA. Refer to **Section 8** for a further discussion on the legal framework. The process for seeking authorisation is undertaken in accordance with the 2014 EIA Regulations, as amended (07 April 2017), promulgated in terms of Chapter 5 of NEMA. Based on the types of activities involved, which include activities listed in GN No. R. 983, R. 984 and R. 985 (see **Table 4**), the requisite environmental assessment for the project is a Scoping and EIA Process.

9.2 Formal Process

The environmental assessment process is divided into two phases, namely: 1) Scoping (current); and 2) EIA. An outline of the Scoping and EIA Process for the proposed Limpopo Central Hospital is provided in **Figure 12**.

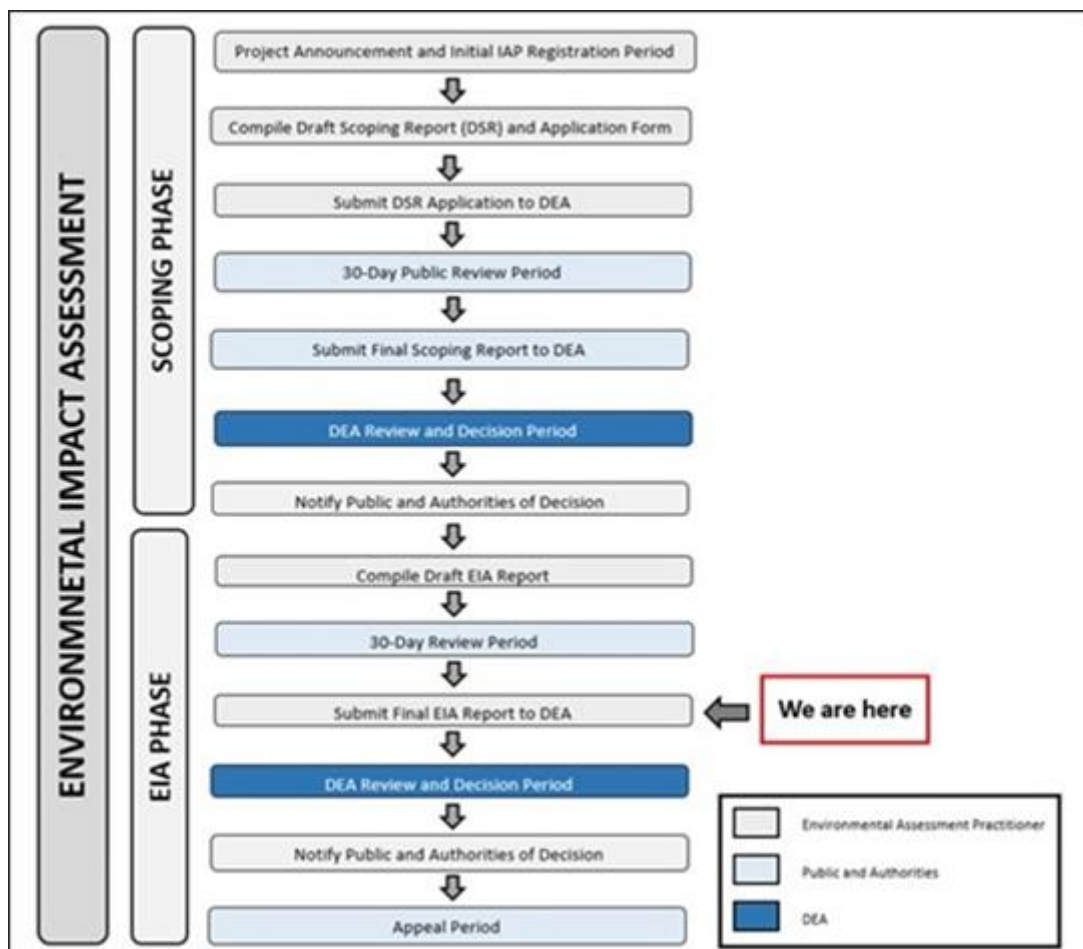


Figure 12: Scoping and EIA Process

9.3 Competent Authority

In terms of the Regulations, the lead decision-making authority for the Scoping and EIA is DEFF, as the project proponent is the National Department of Health.

9.4 Application Form

The Application for Environmental Authorisation for the proposed Limpopo Central Hospital was submitted to DEFF, accompanying the Draft Scoping Report, on 11 July 2019. Refer to **Appendix D** for a copy of the DEFF Application Form.

9.5 Scoping Phase

The purpose of Scoping, which constituted the first phase of the formal EIA Process, included the following:

1. Introduce the proposed project to all IAPs;
2. Engage with IAPs to allow for participation in the process that is transparent, cooperative, informative and robust. Allow for informed decision-making with regard to the EIA process;
3. Identify the significant issues and impacts to be investigated further during the execution of the EIA phase;
4. Consider suitable and feasible alternatives for achieving the project's objectives; and
5. Determine the scope of the ensuing EIA phase in terms of specialist studies, public participation, and assessment of impacts and appraisal of alternatives.

In order to meet the above, the Scoping Report provided the following information:

- ❖ Motivation on the Need and Desirability of the proposed development;
- ❖ Clarity on the roles and responsibilities of the various stakeholders in the project;
- ❖ Information on the Public Participation Process;
- ❖ Information on the Scoping and EIA processes;
- ❖ Description on how the proposed development will be undertaken (if approved);
- ❖ Information on the legislation that has been considered;
- ❖ Information on the Receiving Environment that could be affected by the proposed project;
- ❖ Information on Alternatives which are being considered;
- ❖ Proposed methodology of assessing the potential impacts during the EIA Phase;
- ❖ Findings on the type of Specialist Studies required in the pending EIA Phase; and
- ❖ Proposed Plan of Study for the pending EIA Phase of the project.

The following milestones were completed as part of the preceding Scoping Phase:

- ❖ The project was announced through the distribution of a Background Information Document (BID) and Reply Form, as well as the notification of IAPs via onsite notices, newspaper advertisements, emails, and direct communication in November 2016.

- ❖ A Draft Scoping Report, which conformed to Appendix 2 of GN No. R. 982 (4 December 2014), was compiled. This document included the following salient information (amongst others):
 - a) A Scoping-level impact assessment to identify potentially significant environmental issues for detailed assessment during the EIA phase;
 - b) Screening and investigation of feasible alternatives to the project for further appraisal during the EIA phase; and
 - c) A Plan of Study, which explained the approach to be adopted to conduct the EIA for the proposed project.
- ❖ The Application for Environmental Authorisation, and the accompanying Draft Scoping Report, were submitted to DEA on 11 July 2019.
- ❖ Notification of review of the Draft Scoping Report was undertaken in July 2019. The Draft Scoping Report was lodged for public and authority review from 12 July until 12 August 2019.
- ❖ An Environmental Authorities Meeting was held on 24 July 2019 in order to present the Draft Scoping Report.
- ❖ A Comments and Response Report (CRR) was compiled (which was updated during the execution of the Scoping process), which summarised the issues raised by IAPs and the project team's response to these matters.
- ❖ The Final Scoping Report was submitted to DEA on 22 August 2019.
- ❖ DEA accepted the Scoping Report and Plan of Study for the EIA on 01 October 2019 (refer to **Appendix B**), which allowed the commencement of the EIA phase.

9.6 EIA Phase

The EIA phase (current), which constitutes the second phase of the formal EIA Process, serves to follow from the Scoping phase and provides the following:

- A detailed description of the proposed development and location;
- A description of the environment that may be affected by the activity and the manner in which physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed development;
- The methodology of the stakeholder engagement process will be described;
- The CRR and Stakeholder Database will be provided as an appendix to the EIA Report;
- A description of the need and desirability of the proposed development and the identified potential alternatives to the proposed activity;
- A summary of the methodology used in determining the significance of potential impacts;
- A description and comparative assessment of the project alternatives;

- A summary of the findings of the specialist studies (Copies of all specialist reports appended to the EIA Report);
- A detailed assessment of all identified potential impacts;
- A list of the assumptions, uncertainties and gaps in knowledge;
- An opinion by the consultant as to whether the development is suitable for approval within the proposed site;
- An EMPr that complies with Appendix 4 of GN No. R. 982 of the 2014 EIA Regulations (as amended); and
- Any further information that will assist in decision making by the authorities.

The objectives of the EIA phase, based on GN No. R. 982 of the 2014 EIA Regulations (as amended), are captured in **Section 2**.

9.7 Alignment to the Plan of Study

The Plan of Study, which was contained in the Scoping Report and accepted by DEFF, explained the approach to be adopted to conduct the EIA for the proposed project. The manner in which the EIA Report addresses the requirements of the Plan of Study is shown in **Table 5**.

Table 5: Alignment of EIA Report with Plan of Study

No.	Plan of Study Requirement	EIA Report Alignment
1	Assess pertinent environmental issues identified during Scoping through: 1. Applying an appropriate impact assessment methodology; 2. Conducting specialist studies; 3. Obtaining technical input; and 4. Identifying suitable mitigation measures.	Section 15 and Section 16
2	Assessment of feasible alternatives.	Section 6 and 17
3	Specialist studies to be completed in accordance with Terms of Reference.	Section 13 and Appendix E
4	Public participation to include the following: • Update the database of IAPs; • Allow for the review of the Draft EIA Report; • Convene public meetings; • Compile and maintain a Comments and Responses Report; and • Notification of DEFF Decision.	Section 18
5	EIA Report to satisfy the minimum requirements stipulated in Appendix 3 of GN No. R. 982 of 2014 EIA Regulations (as amended).	Section 1
6	Authority Consultation.	Section 18

9.8 Addressing DEFF's Requirements

9.8.1 Acceptance of the Scoping Report

The manner in which DEFF's specific requirements, as listed in the letter received from this Department for the acceptance of the Scoping Report (refer to **Appendix B**), have been attended to, as described in **Table 6**.

Table 6: DEFF's Specific Requirements – Acceptance of the Scoping Report

No.	DEFF Requirement	Response / Status
1	Please ensure that all relevant stakeholders are provided with an opportunity to comment on the Environmental Impact Report (EIR). This includes but is not limited the Conservation and Biodiversity Chief Directorate of this Department, the provincial authority and the local municipality. Proof of correspondence with the various stakeholders must be included in the Final EIR. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments.	A copy of the Draft EIA Report was submitted to DEFF, DEFF Biodiversity unit, LDEDET and Polokwane LM for comment. The approach to Public Participation during the EIA phase is explained in Section 18 .
2	Please ensure that the relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description. The onus is on the applicant and Environmental Assessment Practitioner to ensure that only the applicable listed activities are included in the application form. A full assessment of impacts and proposed mitigation thereto of all triggered activities must be provided in the Draft EIR	The listed activities are explained in the context of the project in Table 4 . Refer to Section 16 for the impact assessment.
3	If the activities applied for in the application form differ from those mentioned in the Draft EIR, an amended application form must be submitted. Please note that the Department's application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms .	It was not deemed necessary to submit an amended Application Form since the activities applied for do not differ and the most recent application form template was used. Refer to Appendix D for a copy of the DEFF Application Form.
4	Please ensure that all issues raised and comments received during the circulation of the Draft EIR from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed and responded to in the Final EIR. Proof of correspondence with the various stakeholders must be included in the Final EIR. Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014 as amended.	The approach to Public Participation during the EIA phase is explained in Section 18 .

No.	DEFF Requirement	Response / Status
5	Please ensure that the identified alternatives for the proposed activity are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and on the community that may be affected by the activity as per Appendix 2(1)(c)(d) and 2 (h) of GN R.982 of 2014. Alternatively, you must submit written proof of an investigation and motivation, if no reasonable or feasible alternatives exist in terms of Appendix 2 (2)(x)(xii).	Refer to Section 6 and Appendix I1 and I2 for an overview of previously assessed alternatives and motivation.
6	You are further reminded that the Draft EIAR to be submitted to this Department must comply with all the requirements in terms of the scope of assessment and content of Scoping reports in accordance with Appendix 2 and Regulation 21(1) of the EIA Regulations, 2014, as amended.	Refer to Section 1 for the document roadmap, aligned to Appendix 3 of the 2014 EIA Regulations, as amended.
7	Please ensure that the Final EIR includes at least one A3 regional map of the area and that the locality maps included in the Final EIR illustrate the different proposed alignments and above ground storage of fuel. The maps must be of acceptable quality and as a minimum, have the following attributes: <ul style="list-style-type: none"> • Maps are relatable to one another; • Cardinal points; • Co-ordinates; • Legible legends; • Indicate alternatives; • Latest land cover; • Vegetation types of the study area; and • A3 size locality map. 	Refer to the locality and sensitivity maps contained in Appendix A . For technical drawings of the proposed hospital floor's, including the positions of the above ground storage of fuel, refer to Appendix C .
8	Further it must be reiterated that, should an application for Environmental Authorisation be subject to the provisions of Chapter 11, Section 38 of the National Heritage Resources Act, Act 25 of 1999, then this Department will not be able to make not issue a decision in terms of your application for Environmental Authorisation pending letter from the pertinent heritage authority categorically stating that the application fulfils the requirements of the relevant heritage resources authority as described in Chapter 11, Section 38 (8) of the National Heritage Resources Act, Act 25 of 1999.	The Heritage Impact Assessment, undertaken as part of the EIA, will be submitted to LIHRA and SAHRA, and was uploaded to the South African Heritage Resources Information System (SAHRIS) for review and comment. Refer to Appendix E3 for the Heritage Impact Assessment Study.
9	The applicant is hereby reminded to comply with the requirement of Regulation 45 with regard to the time period allowed for complying with the requirements of the Regulations.	Refer to Section 18 for details of the public and authority 30-day review period of the Draft EIA Report.
10	You are requested to submit two (2) copies of the Environmental Impact Report (EIR) to the Department and at least one electronic copy (USB) of the complete final report with the hard copy documents.	Two (2) hardcopies and one (1) electronic copy (USB) of the Final EIA Report was submitted to DEFF.

9.8.2 Comments on Draft EIA Report

The manner in which DEA's comments on the Draft EIA Report (refer to **Appendix G4**), have been attended to are described in **Table 7**.

Table 7: DEFF's Specific Requirements – Comments on the Draft EIA Report

No.	DEFF Requirement	Response / Status
1	<p><u>Socio-Economic Impact Assessment</u> The conclusion made in the Draft Socio-Economic Impact Assessment is not well balanced. Only positive impacts are described in the conclusion as being associated with the 'the decision to move tertiary health care services from the Pietersburg/Mankweng Complex to a new facility...'. A clear reasoned opinion on the sustainability of the proposed development is required. The information must be provided in such a way that the reasoning is clear and can be followed in order to enable the decision-maker to adequately apply his/her own mind to the considerations and to follow the argument. Care must be taken to not elevate less important issues, while downplaying the more important issues.</p> <p>When analysing the alternatives, (refer to Section 8, page 48 of the Socio-Economic Impact Assessment Report) the report only made reference to the no-go alternative. It is noted that there are "Option Analysis" as well as "Layout Alternatives" identified and assessed for proposed for the development. The Specialist Report is required to comment and provide a clear motivation on why the preferred alternative has been chosen as the preferred alternative. Gaps, uncertainties and assumptions must be clearly reported, and the "decision" in terms of the alternatives proposed must be appropriate considering the gaps, uncertainties and assumptions and the need for a risk averse and cautious approach.</p> <p>In discussing the impact on the "homeless/ unlawful people occupying site", the Specialist Report concluded that the appropriate mitigation measure would be "NDOH and the Department of Social Development should arrange formal accommodation with the local NGO's for the homeless people". Is this mitigation measure proposed realistic? What other alternatives were considered to avoid this impact? Often the mitigation measures that are proposed are unrealistic as they place an undue reliance on complicated management measures and long-term and often costly commitments from multiple parties (often third parties), which may be difficult to implement and monitor. Therefore, consideration needs to be give as to how realistic and practical the mitigation</p>	<p>The amended Socio-Economic Impact Assessment (SEIA) which addresses the concerns raised by DEFF, was included and submitted with the Final EIA Report to DEFF (refer to Appendix E4). The SEIA considered and assessed the feasible alternatives provided (i.e. proposed site layout vs. the no-go option). Refer to Section 8 for the analysis of alternatives and motivation as to why the preferred alternative was selected. A summary of the impact on informal inhabitants on the proposed site, as well as mitigation measures, are included in 16.9.2.1 of the EIA Report.</p>

No.	DEFF Requirement	Response / Status
	<p>measures are and what commitment and assurances have been provided by the developer to implement these measures. Gaps, uncertainties and assumptions must be clearly reported. The Specialist Report must also report on the socio-economic and ecological implications should the proposed mitigation measure not be successful.</p>	
2	<p>Terrestrial Ecological Assessment Report It is noted that the Terrestrial Ecological Assessment Report dated November 2019 and compiled by Avhafarei Phamphe of Nemai Consulting was peer reviewed by Anita Rautenbach of Rautenbach Biodiversity Consulting on 31 October 2019. Concerns expressed in the peer review are with regards to the following, inter-alia,</p> <ul style="list-style-type: none"> • “Poor and inaccurate Terms of Reference’ • Inadequate attention given to the impact assessment, analysis and evaluation; • The use of inappropriate approaches and techniques; • The unreliability and inadequacy of data presented; • Provision of insufficient information; • Unclear/inarticulate presentation of information; • Fieldwork was conducted in November 2016 (Section 5.1); therefore information provided for the field assessment is outdated and not reflective of current environmental conditions’. <p>These concerns must be addressed. Revised peer review report from Anita Rautenbach of Rautenbach Biodiversity Consulting in this regard must be submitted to this Department as part of the final EIAR.</p>	<p>The Terrestrial Ecological Impact Assessment incorporated the concerns provided by the peer review (Appendix E5 of the EIA Report). A revised peer review report has been included and submitted with the Final EIA Report to DEFF. All comments provided in the revised peer review report, have been addressed by the specialist which is provided in Appendix E5 of the EIA Report.</p>
3	<p>Please ensure that all relevant listed activities are applied for, are specific and that it can be linked to the development activity or infrastructure as described in the project description.</p>	<p>The listed activities triggered by the proposed project are tabulated and explained in the context of the project in Table 4 of the EIA Report.</p>
4	<p>If the activities applied for in the application form differ from those mentioned in the final EIAR, an amended application form must be submitted. Please note that the Department’s application form template has been amended and can be downloaded from the following link https://www.environment.gov.za/documents/forms.</p>	<p>It was not deemed necessary to submit an amended Application Form since the activities applied for do not differ and the most recent application form template was used. Refer to Appendix D for a copy of the DEFF Application Form.</p>
5	<p>The final EIAR must provide and assessment of the impacts and mitigation measures for each of the listed activities applied for.</p>	<p>Refer to Section 16 of the EIA Report for the impact assessment and mitigation measures.</p>
6	<p>Please ensure that all issues raised and comments received during the circulation of the draft EIAR from registered I&APs and organs of state which have jurisdiction (including this Department’s Biodiversity Section) in respect of the proposed activity are adequately addressed in the final EIAR. Should you be unable to obtain comments, proof should be</p>	<p>The approach to Public Participation during the EIA phase is explained in Section 18 of the EIA Report. All proof of notification and correspondence during the review period of the Draft EIA</p>

No.	DEFF Requirement	Response / Status
	submitted to the Departments of the attempts that we made to obtain comments. The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended.	Report, is included in Appendix G of the EIA Report.
7	The final EIAR must comply with these comments and all other comments and conditions issued by the Department in relation to the proposed development.	The Final EIA Report addressed all comments received from DEFF. Refer to the Comments and Responses Report (CRR), which contains all the comments received from DEFF to date, in Appendix G5 of the EIA Report.
8	A comments and response trail report (C&R) must be submitted with the final EIAR. The C&R report must incorporate all historical comments for this development. The C&R reports must be a separate document from the main report. Please refrain from summarising comments made by I&AP's. All comments from I&AP's must be copied verbatim and responded to clearly. Please note that a response such as "Noted" is not regarded as an adequate response to I&AP's comments.	The CRR, which contains all comments received on the proposed development to date, and responses provided is appended to the EIA Report. Refer to Appendix G5 .
9	In terms of Appendix 2 of the EIA Regulations, 2014, as amended, the report must include an undertaking under oath or affirmation by the EAP in relation to: <ul style="list-style-type: none"> • The correctness of the information provided in the reports; • The inclusion of comments and inputs from stakeholders and I&APs; • The inclusion of inputs and recommendations from the specialist reports where relevant; • Any information provided by the EAP to interested and affected parties; and • Responses by the EAP to comments or inputs made by interested and affected parties. 	The Oath of the EAP and declaration of independence, is included in Section 20 of the EIA Report.
10	The affirmation of oath by the EAP must be witnessed and signed by a commissioner of oath.	The affirmation of oath by the EAP was signed by the EAP and was witnessed and signed by a commissioner of oath. Refer to Section 20 of the EIA Report for the signed Oath of the EAP and declaration of independence.
11	In accordance with Appendix 2 of the EIA Regulations, 2014, as amended, the details of – <ul style="list-style-type: none"> • The EAP who prepared the report; and • The expertise of the EAP to carry out Scoping and Environmental Impact Assessment procedures; must be submitted.	Refer to Section 3 and Appendix I3 of the EIA Report for the EAP's details, CV and expertise.
12	The final EIAR must provide the final EMPr and final Layout Plan.	The Final EMPr is provided in Appendix H of the EIA Report. The Final Site Layout is provided in Appendix C of the EIA Report.
13	You are further reminded that the EIAR to be submitted to this Department must comply with all	Refer to Section 1 of the EIA Report for the document roadmap,

No.	DEFF Requirement	Response / Status
	the requirements in terms of the scope of assessment and content of the EIAR in accordance with Appendix 3 of the EIA Regulations, 2014, as amended.	aligned to Appendix 3 of the 2014 EIA Regulations, as amended.
14	Further note that in terms of Regulation 45 of the EIA Regulations, 2014, as amended, this application will lapse if the applicant fails to meet any of the timeframes prescribed in terms of these Regulations, unless and extension has been granted in terms of Regulations 3 (7) of the EIA Regulations, 2014, as amended.	EIA Timeframes acknowledged. Final EIA Report was submitted within the regulated timeframes.

9.9 Landowner Consent

According to Regulation 39(1) of GN No. 982 of the 2014 EIA Regulations, as amended, if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land.

This requirement does not apply for a Strategic Integrated Project (SIP) as contemplated in the Infrastructure Development Act, 2014. The proposed Limpopo Central Hospital qualifies under SIP 12 and thus landowner consent is not required. Refer to **Appendix I4** for the SIP status confirmation.

10 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations accompany the EIA Process:

- ❖ As the design of the project components is still in feasibility stage, and due to the dynamic nature of the planning environment, the dimensions and layout of the infrastructure may change during the detailed design phase. Any amendments to the scheme will need to comply with the prevailing environmental legal requirements.
- ❖ Regardless of the analytical and predictive method employed to determine the potential impacts associated with the project, the impacts are only predicted on a probability basis. The accuracy of the predictions is largely dependent on the availability of environmental data and the degree of understanding of the environmental features and their related attributes.
- ❖ The Riparian Habitat and Wetland Delineation Impact Assessment (The Biodiversity Company, 2019) indicated the following limitations:
 - According to the wetland definition used in the National Water Act 36 of 1998 (NWA), four wetland indicators are used to delineate wetland boundaries. The general area has been disturbed by local developments, notably excavations, dumping and local developments. These general developments, compounded by the dry season survey period have inhibited the application of the recognised wetland indices, this may inhibit the accuracy of the delineated wetland areas.
- ❖ The Heritage Impact Assessment (PGS, 2019) noted the following assumptions and limitations:
 - Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the development area. Various factors account for this, including the subterranean nature of some archaeological sites. As such, should any heritage features and/or objects not included in the present inventory, be located or observed, a heritage specialist must immediately be contacted.
 - Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question, which also applies to graves and cemeteries. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out in the report.
- ❖ The Socio-Economic Impact Assessment (Nemai Consulting, 2019a) noted the following assumptions and limitations:
 - The study was done with the information available to the specialist at the time of executing the study, within the available time frames and budget. The sources consulted are not exhaustive, and additional information which might strengthen

- arguments, and/or identify additional information might exist. However, the specialist did endeavour to take an evidence-based approach in the compilation of this report and did not intentionally exclude information relevant to the assessment.
- This report is the result of a short-term study; no long-term studies were conducted on site. As a result of the short-term nature of this study, the opportunity for primary data collection was limited. This study therefore depends heavily on secondary or existing data sources such as those listed above. It is assumed that these sources are dependable and of good quality;
 - Regardless of the analytical and predictive method employed to determine the potential impacts associated with the project, the impacts are only predicted on a probability basis. The accuracy of the predictions is largely dependent on the availability of environmental data and the degree of understanding of the environmental features and their related attributes;
 - It is assumed that all information provided by the Environmental Assessment Practitioner was accurate as was the information provided in other specialist studies used in this report;
 - It was assumed that the information gathered through the public participation process was a true reflection of the attitude of the public towards the project and as such was accurately recorded;
 - The study was completed using the Statics South Africa Census 2011 data. While it is acknowledged that they data is somewhat outdated, it is the most comprehensive primary data available;
 - It must be assumed that all the interview reports are based on reflections provided by those present and may or may not necessarily be a reflection of future conditions.
 - It is assumed that information obtained during the interviews provide an honest account of the community and community relationship for the hospital. It must be noted, however, that meetings are not statistically representative.
 - An information gap for this study is the exact circumstances of the homeless dwellers on the site. Information was not able to be obtained with regards the duration of rough sleeping on the site, not their sources of income. This affects approximately four people, who will be impacted by the project. The information gap can be filled in the pre-construction phase, given the transient nature of the homeless dwellers.
- ❖ The Terrestrial Ecological Impact Assessment (Nemai Consulting, 2019b) noted the following constraints and limitations:
- The majority of threatened plant species are seasonal and only flower during specific periods of the year. Time constraints did not allow for repeated sampling over different seasons and so desktop surveys were used to provide additional information based on the current state of the receiving environment.

- Due to the brief duration of the survey, the species list provided for the study area cannot be regarded as comprehensive, but because of the season of the survey (summer), many of species present on site were identifiable at the time of the surveys.
- The ecological study process was undertaken prior to the availing of certain information which would only be derived from the final project design and layout. The design layout had not been finalised yet at the time of the ecological study.
- The potential of future similar developments in the same geographical area, which could lead to cumulative impacts cannot be meaningfully anticipated.
- Since environmental impact studies deal with dynamic natural systems additional information may come to light at a later stage and Nemaï Consulting can thus not accept responsibility for conclusions and mitigation measures made in good faith based information gathered or databases consulted at the time of the investigation.

11 NEED AND DESIRABILITY

In terms of 3(1)(f) of Appendix 3 of GN No. R. 982 of the 2014 EIA Regulations, as amended, this section discusses the need and desirability of the project. The format contained in the Guideline on Need and Desirability (DEA&DP, 2009) has been used in **Table 8**.

Table 8: Need and Desirability for the Proposed Limpopo Central Hospital

No.	Question	Response
NEED ('timing')		
1.	Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (i.e. is the proposed development in line with the projects and programmes identified as priorities within the IDP).	The SDF for the Polokwane LM (2017) acknowledges the need for the LCH and specifically states under social services as part of the proposed strategic thrusts for local economic development: <i>"Implementation of academic hospital in Polokwane"</i>
2.	Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	Refer to response for item 1 above.
3.	Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate)	<ul style="list-style-type: none"> Based on the National Service Delivery Agreement, the current public health infrastructure cannot adequately support the service delivery needs of the country; The proposed Limpopo Central Hospital features within SIP 12: Revitalisation of public hospitals and health facilities; Polokwane SDF mentions the implementation of the academic hospital as part of the strategic thrusts to enhance local economic development within the LM; and Polokwane IDP states that improved health care is part of the LMs Medium Term Strategic Framework (MTSF).
4.	Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	<p>Water and sanitation networks will be tied in to existing infrastructure with adequate capacity.</p> <p>The main power supply to the site will be obtained from the Beta Substation located in Suid Street. Sufficient capacity is available from this substation to allow for a 12MVA connection to the site.</p> <p>All services required for the development of the proposed hospital, are explained in Section 7.3.</p>
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure	<p>The project aims to improve the health care and tertiary services in the Local Municipality.</p> <p>See the response in item no. 1 above in terms of the reference</p>

No.	Question	Response
	planning of the municipality (priority and placement of services)?	to the proposed LCH in the Polokwane LM's SDF and IDP.
6.	Is this project part of a national programme to address an issue of national concern or importance?	Yes. The proposed Limpopo Central Hospital features within SIP 12: Revitalisation of public hospitals and health facilities
DESIRABILITY ('placing')		
7.	Is the development the best practicable environmental option (BPEO) for this land/site?	The proposed site is vacant land situated within an urban developed area, between existing schools (New Horizon and Northern Academy Secondary School), residential areas and roads (Webster and Suid Street), and runs parallel to the N1 Polokwane bypass.
8.	Would the approval of this application compromise the integrity of the existing approved municipal IDP and SDF as agreed to by the relevant authorities?	It is not anticipated that the proposed project will contradict or be in conflict with the municipal IDPs and SDFs (refer to response provided above to item no. 1).
9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	According to the Capricorn DM Bioregional Plan (2018) the proposed site falls within zones classified as 'towns and settlements'. Refer to Section 14.9.1.3 for a discussion of the project in relation to Critical Biodiversity Areas.
10.	Do location factors favour this land use (associated with the activity applied for) at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context).	Refer to response on item 7 above.
11.	How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	Refer to a discussion of the status quo of the built, natural and socio-economic environment, and potential impacts in Section 14 . See compilation of significant environmental issues associated with the proposed project contained in Section 16 .
12.	How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?	
13.	Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	Opportunity costs, which are associated with the net benefits forgone for the development, will be considered in the Socio-economic Study during EIA phase.
14.	Will the proposed land use result in unacceptable cumulative impacts?	All possible cumulative impacts are discussed in Section 16.20 .

12 TIMEFRAMES

In terms of 3(1)(r) of Appendix 3 of GN No. R. 982 of 4 December 2014 (as amended), this section discusses the period for which the Environmental Authorisation is required (commencement), the duration of the construction phase, and the post construction monitoring requirements.

Based on the current EIA programme, it is anticipated that the Environmental Authorisation (if granted) will be issued by March 2020. If Environmental Authorisation is received, the construction phase of the project should commence within 5 years of the authorisation being granted. The duration of the construction phase is estimated to be 5 years. Once construction has been completed, post construction monitoring (rehabilitation) will commence.

13 FINANCIAL PROVISIONS

In terms of section 3(1)(n) of Appendix 3 of GN No. R. 982 of 4 December 2014 (as amended), this section discusses details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts.

Due to the sensitive nature of financial provisions, DoH cannot detail the exact amounts but can confirm that there will be sufficient funds available to ensure that the project can be successfully completed and for subsequent maintenance. Provision will be made in the bill of quantities for the Contractor for the implementation of mitigation measures included in the EMPr, including requirements for reinstatement and rehabilitation.

14 PROFILE OF THE RECEIVING ENVIRONMENT

14.1 General

This section provides a general description of the status quo of the receiving environment in the project area. This serves to provide the context within which the EIA exercise was conducted. It also allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed project.

Where necessary, the regional context of the environmental features is also explained, with an ensuing focus on the local surrounding environment. The reader is referred to **Section 15** for more elaborate explanations of the specialist studies and their findings for specific environmental features. This section allows for an appreciation of sensitive environmental features and possible receptors of the effects of the proposed project. The potential impacts to the receiving environment are discussed further in **Section 16**.

The following features have been considered, and are discussed in the sections to follow:

1. Land Use and Land Cover
2. Climate;
3. Geology;
4. Soils;
5. Geohydrology;
6. Topography;
7. Surface Water;
8. Flora;
9. Fauna;
10. Socio-Economic Environment;
11. Agriculture;
12. Air Quality;
13. Noise;
14. Historical and Cultural Features;
15. Planning;
16. Existing Structures and Infrastructure;
17. Transportation;
18. Waste Disposal Facilities; and
19. Aesthetic Qualities.

14.2 Land Use & Land Cover

The dominant land cover in the area earmarked for the project infrastructure is shown in **Figure 13**. The 2013-14 South African National Land-cover dataset produced by GEOTERRAIMAGE shows that the proposed site falls mainly within land cover classified as open bush and grassland.

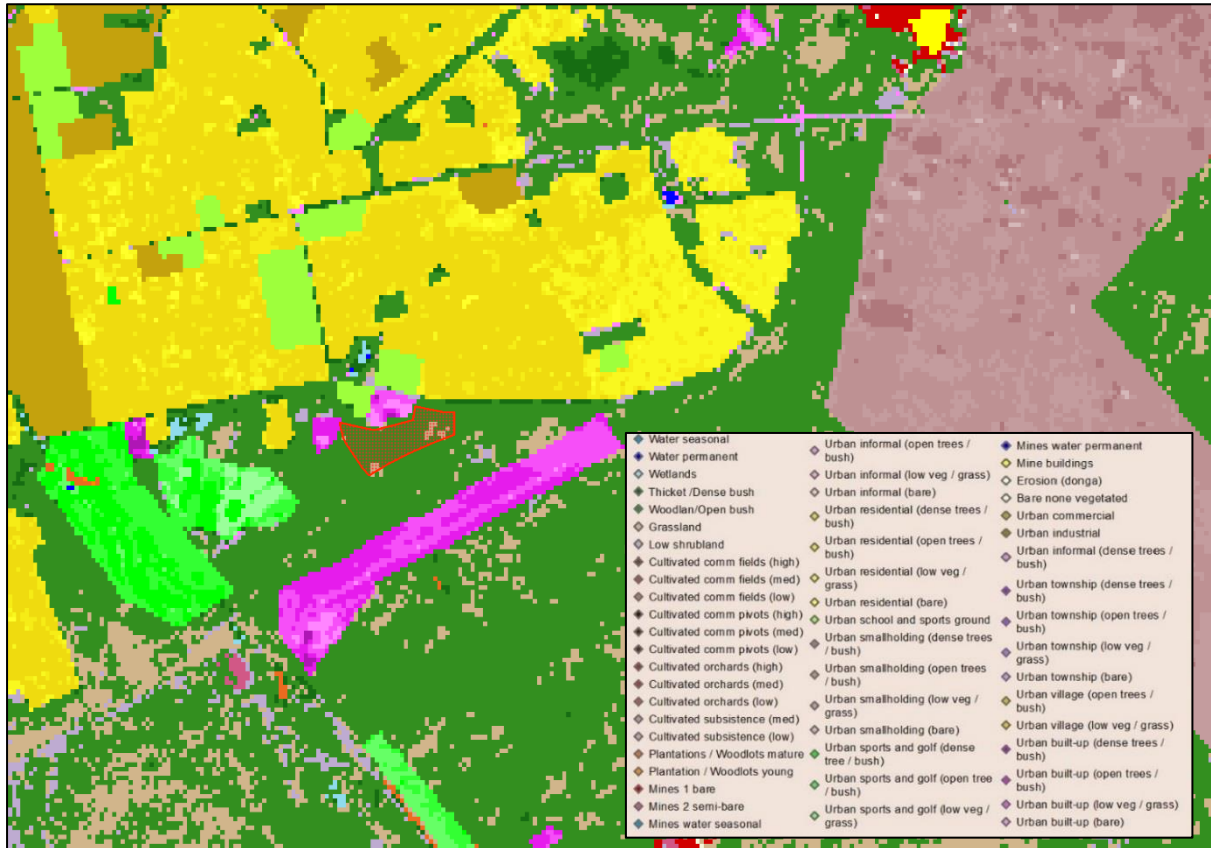


Figure 13: Land Cover Map (GEOTERRAIMAGE)

Further details on the agricultural land use in the project area, is contained in the Agricultural Impact Assessment (contained in **Appendix E1**) and are discussed further in **Section 14.12**.

14.3 Climate

14.3.1.1 Precipitation

According to **Figure 14**, the area experiences summer rainfall with the highest precipitation occurring during the months of December and January (110 mm), and the lowest precipitation occurring between June and August (< 5 mm). Average precipitation for the area is 598 mm per annum.

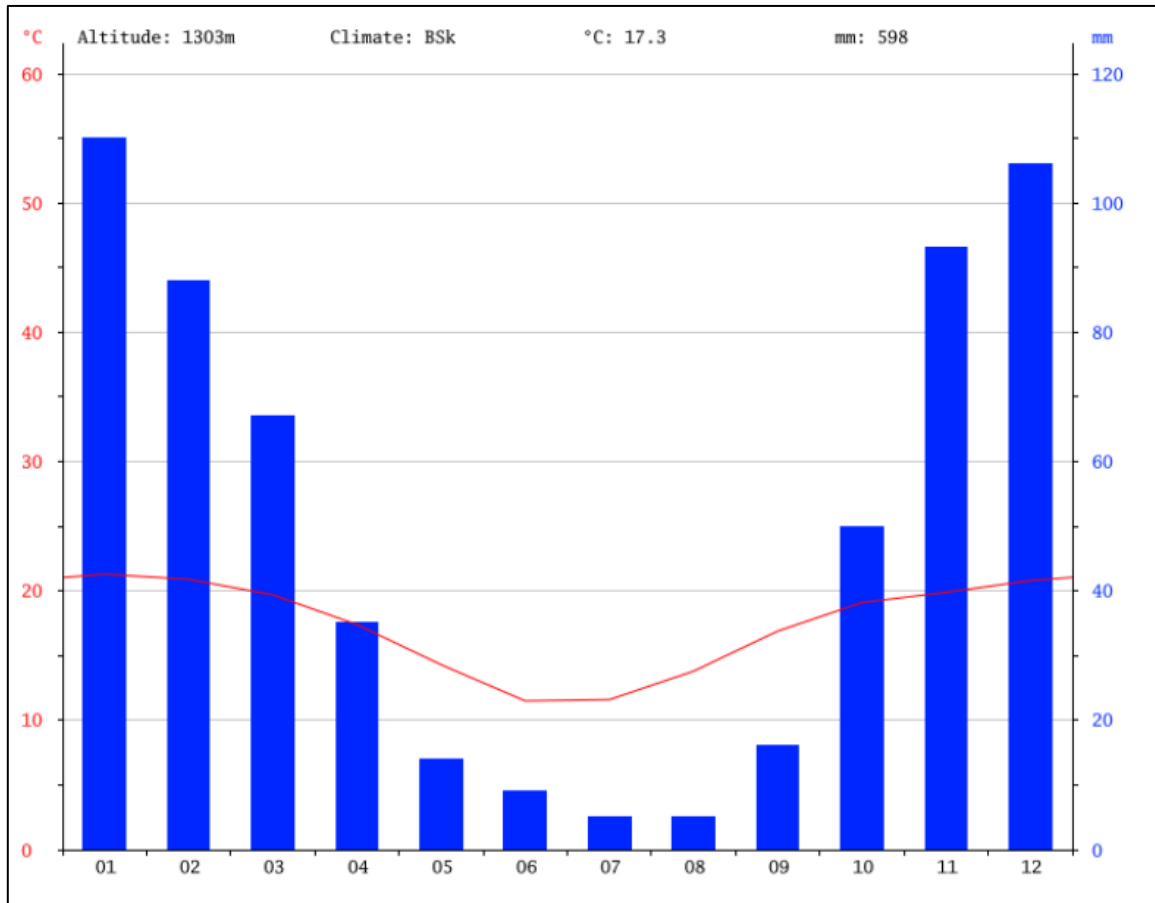


Figure 14: Precipitation in Polokwane LM (<https://en.climate-data.org/africa/south-africa/limpopo/polokwane-3759/>)

14.3.1.2 Temperature

According to **Table 9** below, the highest temperatures occur from December – February, whereas the coldest temperatures occur from June – July. The highest average temperature occurs in January (21.3 °C) and lowest temperature occurs in July (3.8 °C). The area experiences an average annual temperature of 17.3 °C.

Table 9: Temperature in Polokwane LM (<https://en.climate-data.org/africa/south-africa/limpopo/polokwane-3759/>)

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	21.3	20.9	19.7	17.4	14.3	11.5	11.6	13.8	16.9	19.1	19.9	20.8
Min. Temperature (°C)	16	15.6	14.2	11.3	7.1	3.9	3.8	6	9.4	12.6	14.3	15.4
Max. Temperature (°C)	26.6	26.2	25.3	23.6	21.5	19.1	19.4	21.6	24.4	25.6	25.5	26.2

14.4 Geology

Refer to the simplified geological map in **Figure 15**.

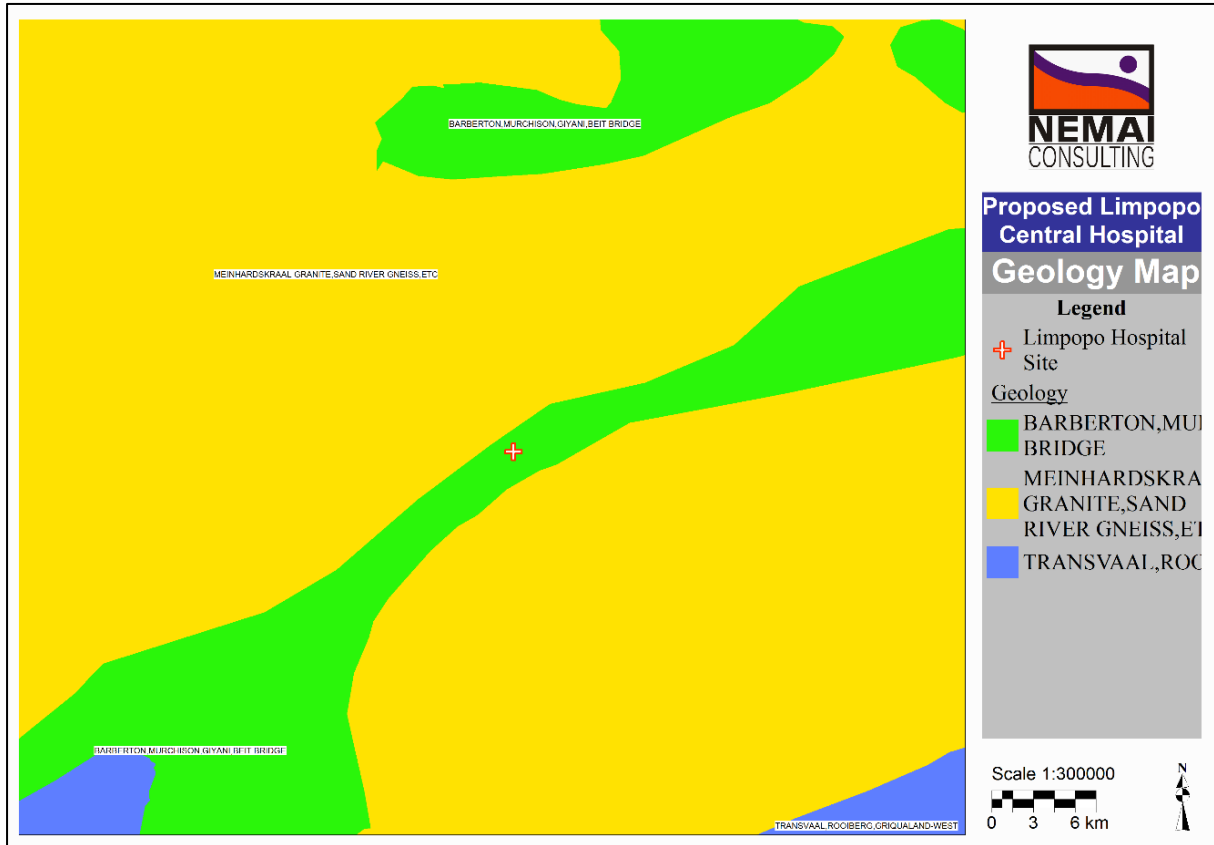


Figure 15: Geology Map

Stratigraphy

Based on the findings of the geotechnical study (AGES, 2010a) the study area is underlain by leucocratic migmatite and gneiss, grey- and pink hornblende-biotite gneiss, grey biotite gneiss, minor muscovite-bearing granite, pegmatite and gneiss, collectively known as the Hout River gneiss. These strata generally dip towards the south at an angle of approximately 45°. Occasional roughly east-west trending lenses of talc-chlorite and amphibolite-chlorite schist, amphibolite and serpentinite, collectively known as the Mothiba Formation of the Pietersburg group, Murchison Supergroup, may cut through the area.

Structural Geology

The study area does not reflect a risk for the formation of sinkholes or subsidence caused by the presence of water-soluble rocks, and as such is seen as “non-dolomitic land”. The results of geophysical surveys conducted as part of a Geohydrological assessment of the area confirmed the occurrence of four weakly defined dyke intrusions within the study area.

14.5 Soils

Soil classes encountered in the project area are shown in **Figure 16**. The site is situated within soils classified as class S2: freely drained, structureless soil.

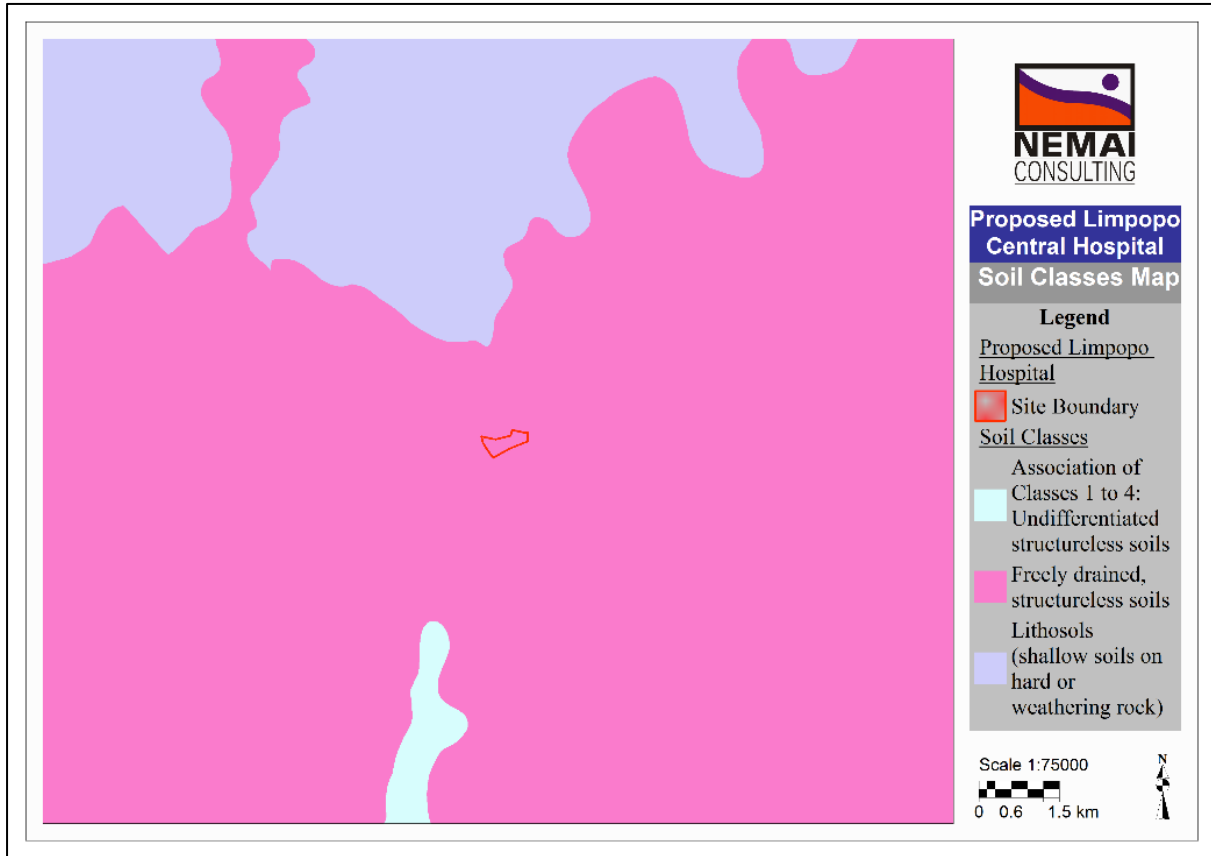


Figure 16: Soil Classes Map

Further details on soil types and soil potential are contained in the Agricultural Impact Assessment (see **Appendix E1**).

14.6 Geohydrology

Based on the findings from the geotechnical study (AGES, 2010a) the weathered gneiss bedrock underlying the study area represents a weathered and fractured aquifer where groundwater rest level occurs along fractures within the weathered bedrock at depth. Groundwater yields of between 0.3 and 3 l/s are expected for successful boreholes, with static groundwater levels of between 10 and 30 mbdl reported.

Significant groundwater seepage was not encountered in the test pits or core boreholes. However, the presence of weakly ferruginized material at relatively shallow depth throughout the area indicates the weak seasonal formation of perched water tables within the topsoil overlying the less permeable weathered bedrock directly after heavy precipitation events. This may persist for a while into the drier months following the annual rainy season.

A Geohydrological investigation (AGES, 2010b) was conducted and evaluated the groundwater conditions on the proposed site. The investigation drilled two boreholes on the site (**Figure 17**) and water samples from the boreholes were tested for water quality.



Figure 17: Borehole Locality Map (AGES, 2010b)

14.7 Topography

According to the findings from the geotechnical study (AGES, 2010a), the site is located within an area deemed a gently undulating plain composed of low ridges with rounded crests exhibiting gentle side slopes separated by occasional shallow valleys associated with non-perennial streams. The study area itself is placed along the very gently dipping mid slope of a localized ridge occurring to the southeast.

The area exhibits an average slope of approximately 1° to the northwest. The minimum elevation is situated on the western side of the site (1304m) and the maximum elevation situated on the eastern side (1312m). Refer to **Figure 18** below.

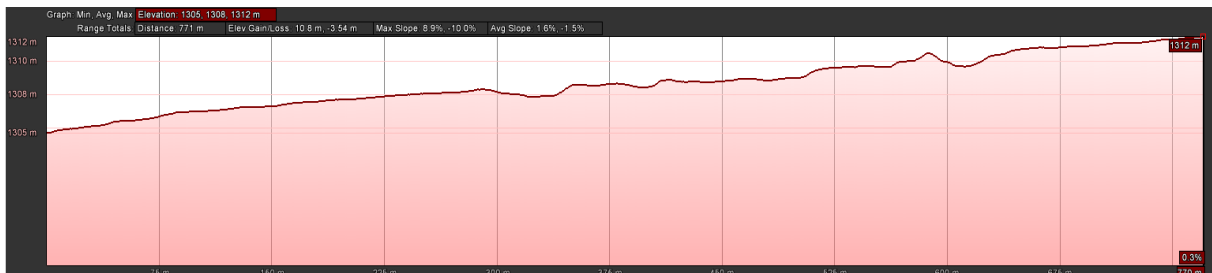


Figure 18: Google Earth Elevation Profile (West to East)

The proposed site is situated on a relatively flat area (refer to **Figure 19**).



Figure 19: Contour Map (20m interval)

14.8 Surface Water

14.8.1 Water Management Areas

As per **Figure 20** below, the proposed site is situated within the Limpopo Water Management Area (WMA), and within the quaternary catchment: A71A.

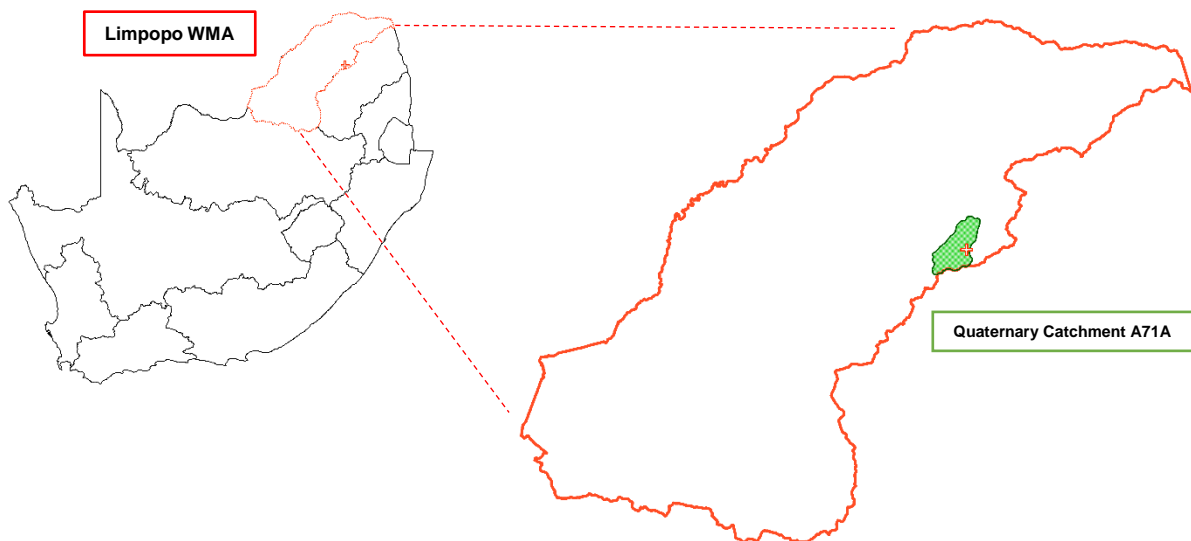


Figure 20: Limpopo WMA and quaternary catchments

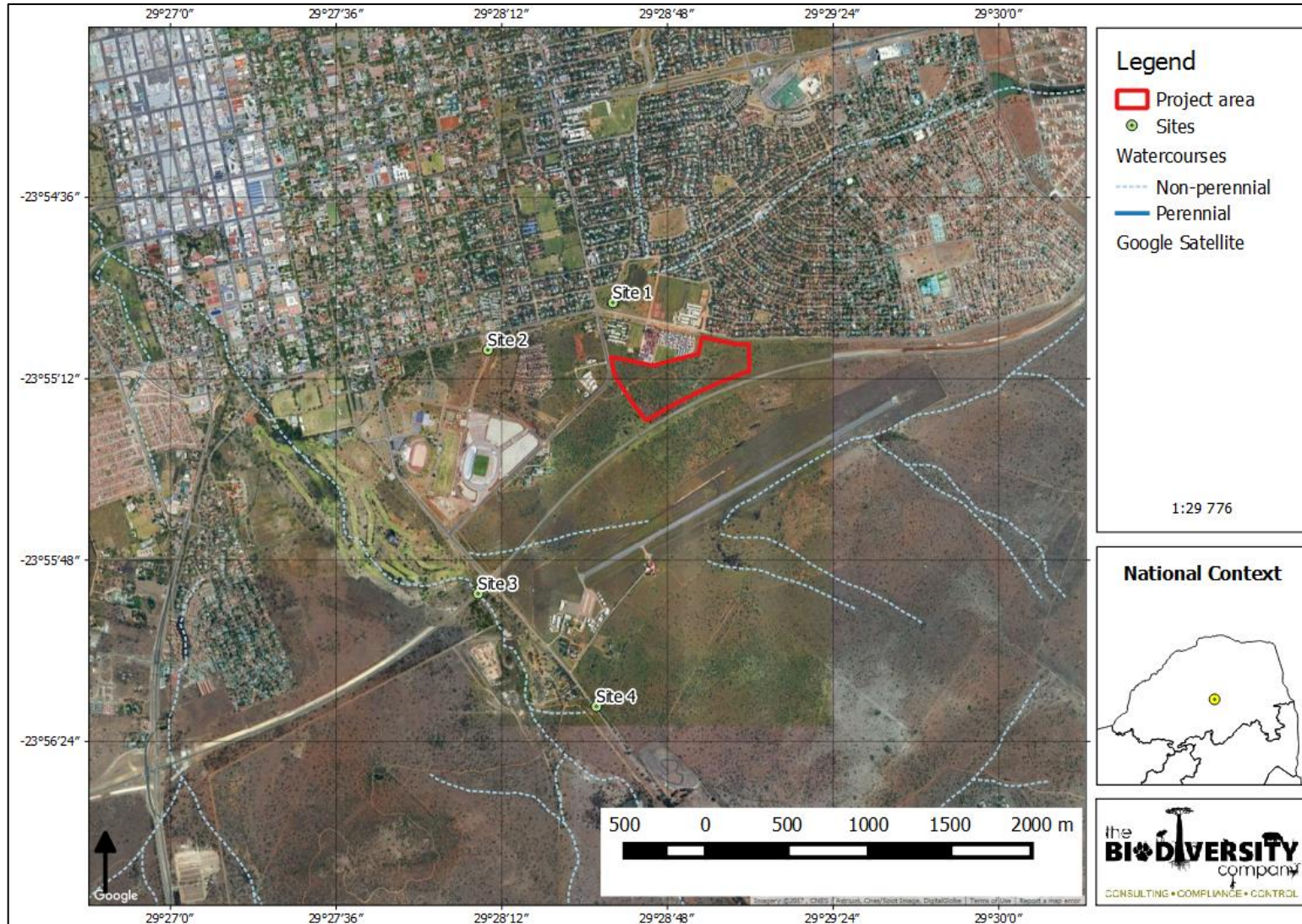


Figure 21: Watercourses Map (The Biodiversity Company, 2019)

14.8.2 Watercourses

According to **Figure 21**, the proposed site does not contain any watercourses on site, with the nearest non-perennial river situated 300m to the north of the site.

Although no activities within the site boundary are expected to encroach upon the regulated area of a watercourse (i.e. 1:100 year floodline / delineated riparian or 500 m of a wetland habitat), should this change through a change of scope, a water use authorisation might be required in terms of Section 21 of the National Water Act (Act No. 36 of 1998).

A Riparian Habitat and Wetland Delineation Impact Assessment (see **Appendix E2**) was conducted for the proposed project. Refer to **Sections 15.3** and **16.7.2** for a synopsis of the study and related impact assessment, respectively.

14.9 Flora

The information to follow was sourced from the Terrestrial Ecological Impact Assessment (see **Appendix E5**).

Refer to **Sections 15.4** and **16.8.2** for a synopsis of the study and a related impact assessment, respectively.

14.9.1 Regional Vegetation

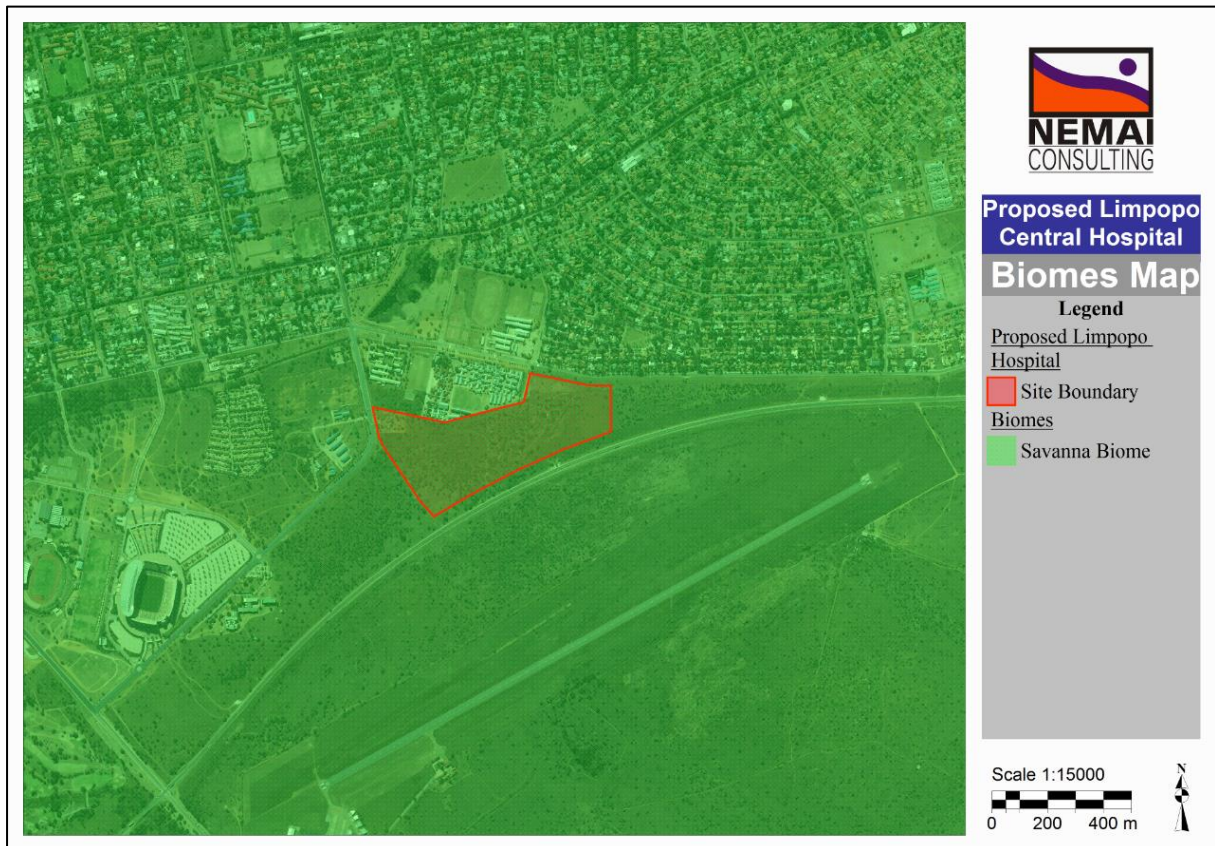


Figure 22: Savanna Biome Map

Mucina and Rutherford (2016) described the study area as falling within the Savanna Biome (**Figure 22**). The Savanna Biome is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the lowveld and Kalahari region of South Africa and is also the dominant vegetation in Botswana, Namibia and Zimbabwe. It is characterized by a grassy ground layer and distinct upper layer of woody plants (Low and Rebelo, 1996).

The proposed site is situated within the Polokwane Plateau Bushveld vegetation type (see **Figure 23**). According to Mucina and Rutherford, 2006, the Polokwane Plateau Bushveld vegetation type is found in Limpopo Province in the higher-lying plains around Polokwane, north of the Strydpoort Mountains and south of the SVcb 20 Makhado Sweet Bushveld.

The conservation status of this vegetation type is classified as **least threatened** with a national conservation target of 19%.

Less than 2% is statutorily conserved mainly in the Percy Fyfe and Kuschke Nature Reserves. In addition, 0.7% is conserved in other reserves, for example the Polokwane Game Reserve. Some 17% is transformed, including about 10% cultivated and 6% urban and built-up. Dense concentration of rural human settlements is found particularly in the eastern and north-western parts of the vegetation unit.

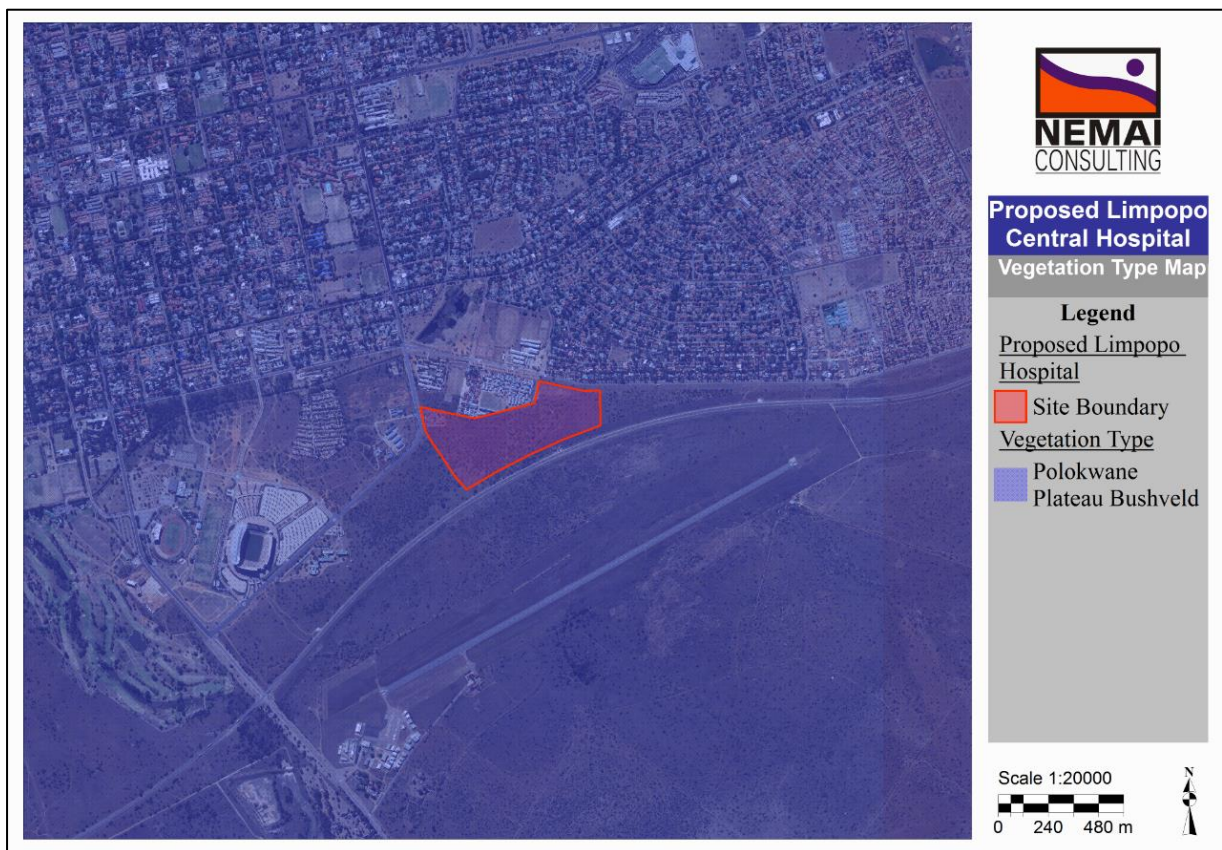


Figure 23: Vegetation Type Map

14.9.2 Threatened Ecosystems

According to the data sourced from SANBI, the proposed site is not situated within any terrestrial threatened ecosystems, with the closest threatened ecosystem, being the Woodbush Granite Grassland, situated approximately 40km east of the site (**Figure 24**).

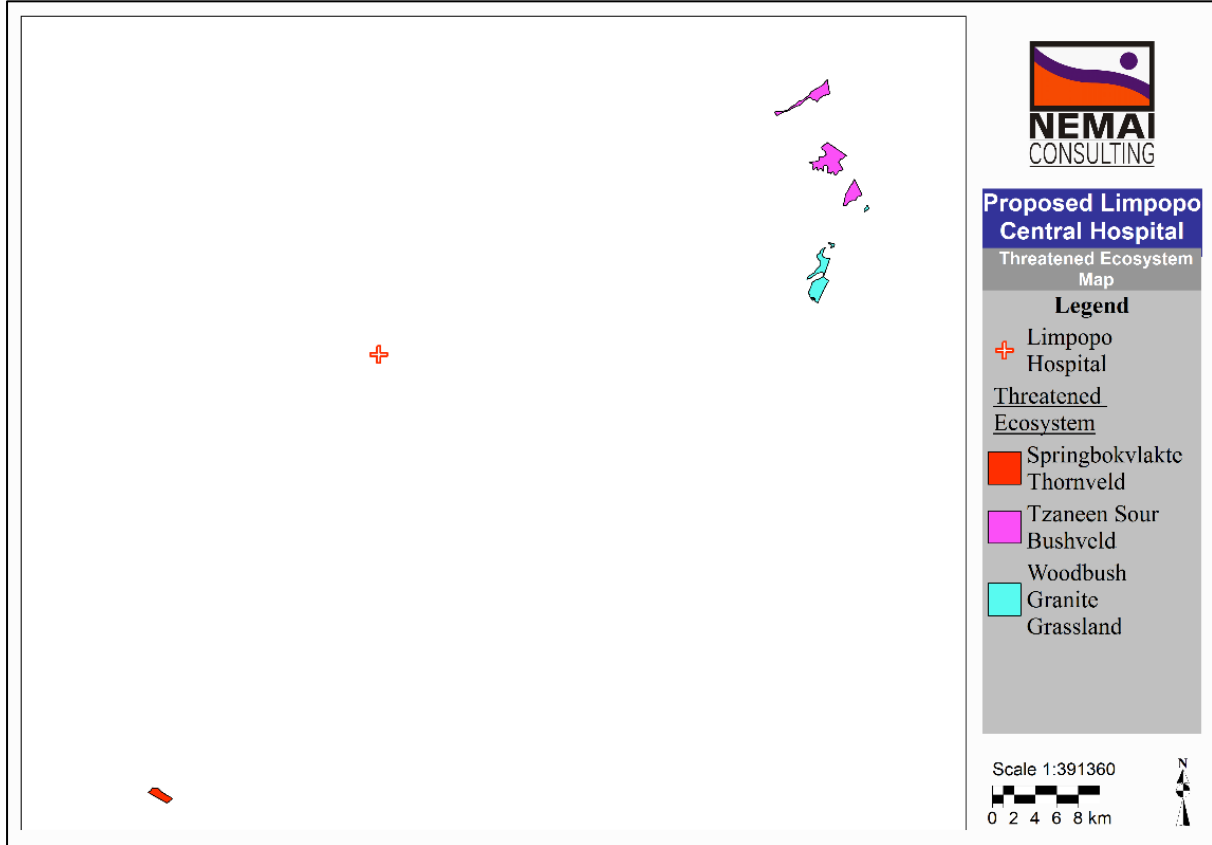


Figure 24: Threatened Ecosystems Map

14.9.3 Limpopo Conservation Plan

Critical Biodiversity Areas (CBAs) within the bioregion are the portfolio of sites that are required to meet the region's biodiversity targets, and need to be maintained in the appropriate condition for their category (Desmet et al, 2013). An objective of the CBA map is to identify a network of areas, which if managed according to the land use guidelines would meet the pattern targets for all important biodiversity features, while at the same time ensuring the areas necessary for supporting necessary ecological processes remain functional. The systematic conservation planning process resulted in 40% of the Limpopo Province being identified as CBAs (CBA1 22% and CBA2 18%). Ecological Support Areas (ESAs) cover a further 22% of the province, of which 16% are intact natural areas (ESA 1) and 7% are degraded or areas with no natural remaining which are nevertheless required as they potentially retain some value for supporting ecological processes (ESA 2) (Desmet et al, 2013).

A map indicating the Limpopo Conservation Plan categories in relation to the project footprint is shown in **Figure 25**.

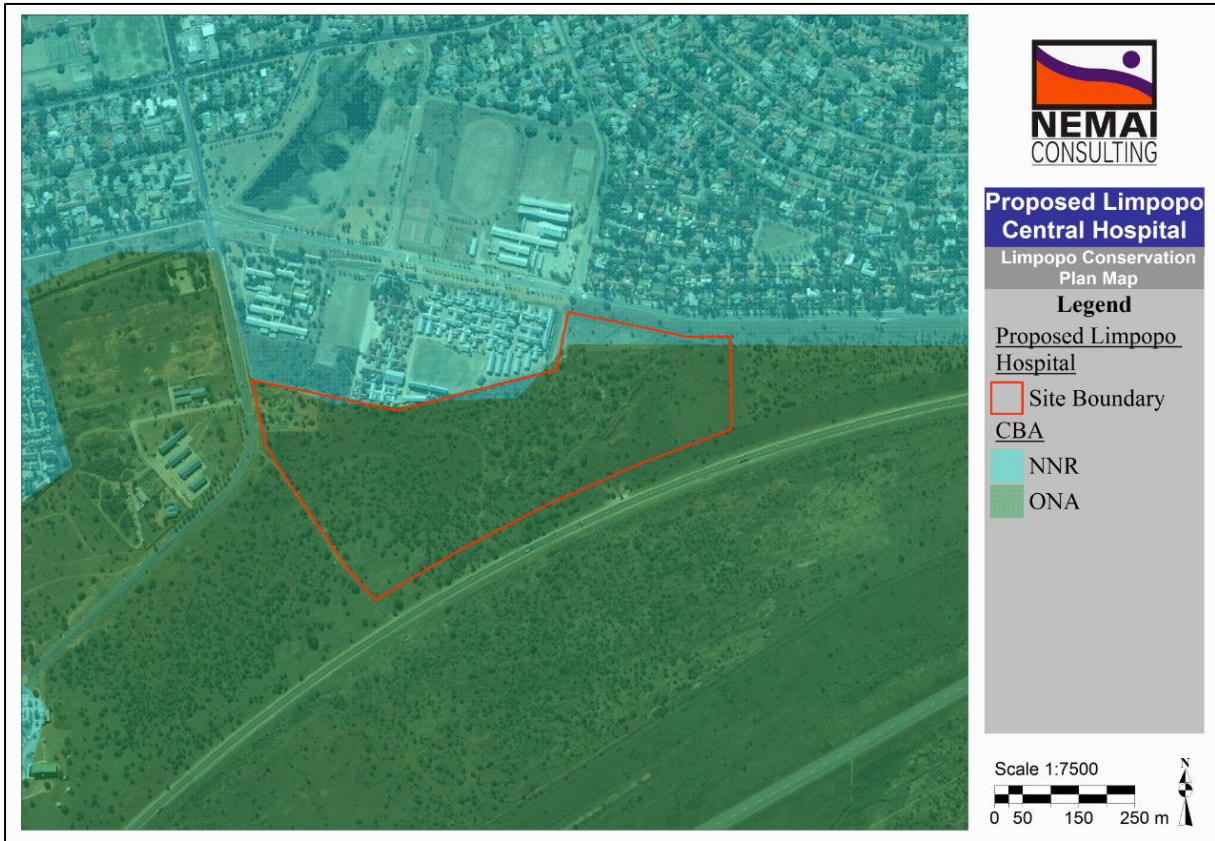


Figure 25: Limpopo Conservation Plan Map

The project footprint in relation to the Limpopo Conservation Plan is as follows:

- ❖ **ONA** – Other Natural Area: Majority of the proposed site falls within this category;
- ❖ **NNR** – No Natural Remaining: a small section on the northern side of the proposed site falls within this category.

The general description of CBA map categories, including ONA and NNR categories and associated land management objectives are listed in **Table 10**.

Table 10: Summary of map categories and land management objectives (LEDET, 2019)

Category	Definition/ Description	Land Management Objective	Land Management Recommendations
Protected Areas	<ul style="list-style-type: none"> Formal Protected Areas and Protected Areas pending declaration under the National Environmental Management Protected Areas Act (NEMPAA), including National Parks, Nature Reserves, Special Nature Reserves and Protected Environments. 	<ul style="list-style-type: none"> As per the relevant Protected Area Management Plan 	<ul style="list-style-type: none"> Maintain or obtain formal conservation protection
Critical Biodiversity Area 1 (CBA1)	<ul style="list-style-type: none"> Irreplaceable sites. Areas that are essential for meeting biodiversity targets. No alternative sites are available to meet targets. 	<ul style="list-style-type: none"> Maintain in a natural state with limited or no biodiversity loss. Rehabilitate degraded areas to a natural or near natural state, and manage for no further degradation. 	<ul style="list-style-type: none"> Obtain formal conservation protection where possible. Implement appropriate zoning to avoid loss of intact habitat or intensification of land use.
Critical Biodiversity Area 2 (CBA2)	<ul style="list-style-type: none"> Areas selected to meet biodiversity targets. Alternative sites may be available to meet targets, but these are the optimal sites based on complementarity, connectivity and avoidance of conflict with other land uses. 	<ul style="list-style-type: none"> Maintain in a natural state with limited or no biodiversity loss. Rehabilitate degraded areas to a natural or near natural state, and manage for no further degradation. 	<ul style="list-style-type: none"> Obtain formal conservation protection where possible. Implement appropriate zoning to avoid loss of intact habitat or intensification of land use.
Ecological Support Area 1 (ESA1)	<ul style="list-style-type: none"> Natural, near natural and semi-natural or degraded areas that support the ecological functioning of CBAs and protected areas and maintain ecological processes. 	<ul style="list-style-type: none"> Maintain ecosystem functionality and connectivity allowing for limited loss of biodiversity pattern. 	<ul style="list-style-type: none"> Implement appropriate zoning and land management guidelines to avoid impacts on ecological processes and connectivity. Avoid intensification of land use. Avoid fragmentation of natural landscape.
Ecological Support Area 2 (ESA2)	<ul style="list-style-type: none"> Areas with no natural habitat that are nevertheless important for supporting ecological processes. 	<ul style="list-style-type: none"> Avoid additional / new impacts on ecological processes. Ensure that land use is not intensified and that activities are 	<ul style="list-style-type: none"> Avoid intensification of land use, which may result in additional impact on ecological processes. Avoid conversion of agricultural land to more intensive land uses

Category	Definition/ Description	Land Management Objective	Land Management Recommendations
		managed to minimise impact on threatened species.	to more intensive forms of agriculture, which may have a negative impact on threatened species or ecological processes.
Other Natural Areas (ONA)	<ul style="list-style-type: none"> Natural and intact but not required to meet targets, and not identified as CBAs or ESAs. 	<ul style="list-style-type: none"> Subject to town and regional planning guidelines and policy. 	<ul style="list-style-type: none"> Subject to town and regional planning guidelines and policy.
No Natural Habitat Remaining (NNR)	<ul style="list-style-type: none"> Areas with no significant direct biodiversity importance. Areas with no natural habitat or degraded natural areas that are not required as ESAs, including intensive agriculture, urban, industry and built infrastructure. 	<ul style="list-style-type: none"> Subject to town and regional planning guidelines and policy. 	<ul style="list-style-type: none"> Subject to town and regional planning guidelines and policy.

14.9.4 Protected Areas

The nearest protected area, with a formal status in terms of the National Environmental Management Protected Areas Act (Act No. 57 of 2003) in relation to the project footprint is the Kuschke Nature Reserve, approximately 11km south-west from the site (Refer to **Figure 26**).

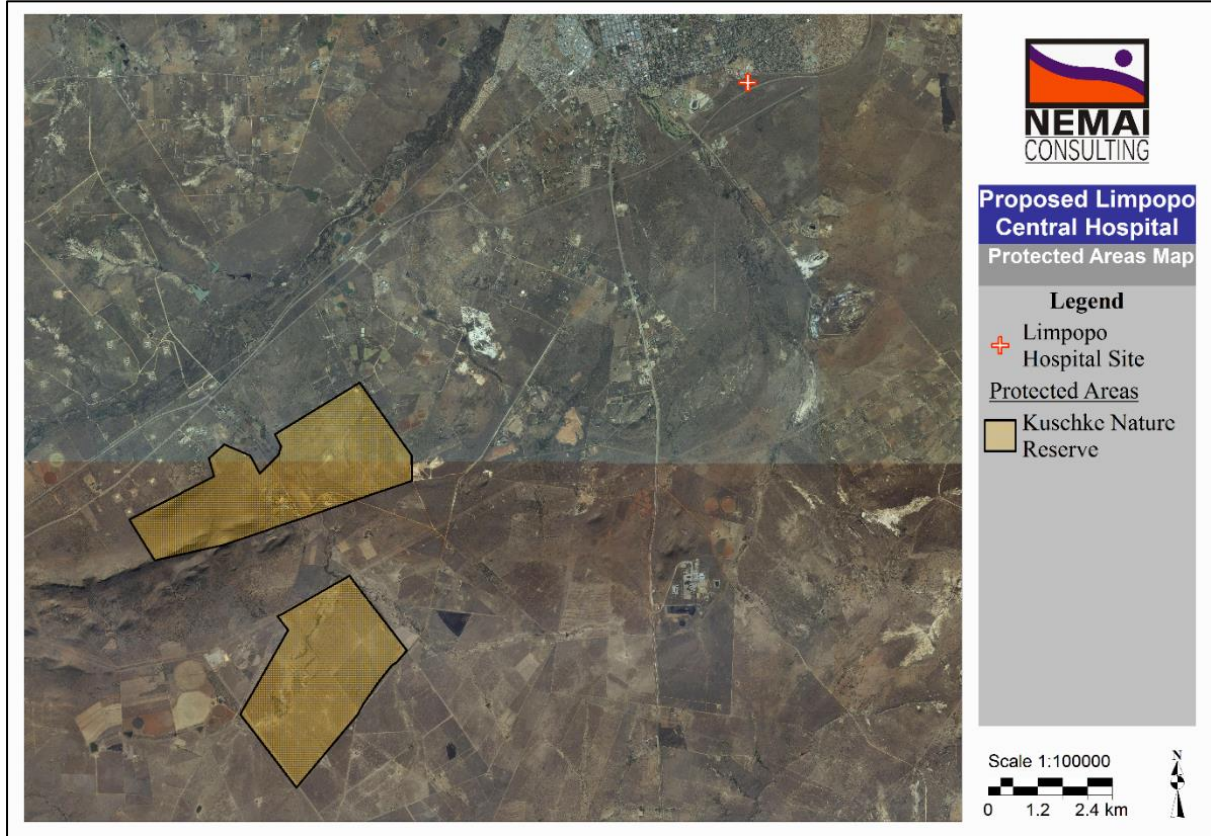


Figure 26: Protected Areas Map

14.9.5 Flora species

The proposed site is located within the 2329CD quarter degree square in terms of the 1:50 000 grid of South Africa. SANBI uses this grid system as a point of reference to determine any Red Data plant species or any species of conservation importance occurring in South Africa. This can be used to determine the list of species which could potentially occur within an area. **Table 11** indicates the plants that are known to occur on or around the project area recorded in 2329CD quarter degree square.

Table 11: Red Data plant species recorded in grid 2329 CD

Family	Species	Threat status	Growth forms
<i>Amaryllidaceae</i>	<i>Clivia caulescens</i> R.A.Dyer	NT	Geophyte
<i>Apocynaceae</i>	<i>Brachystelma minor</i> E.A.Bruce	VU	Geophyte
<i>Celastraceae</i>	<i>Elaeodendron transvaalense</i> (Burt Davy) R.H.Archer	NT	Shrub, tree
<i>Commelinaceae</i>	<i>Commelina rogersii</i> Burt Davy	VU	Herb

Family	Species	Threat status	Growth forms
<i>Euphorbiaceae</i>	<i>Euphorbia groenewaldii</i> R.A.Dyer	CR	Dwarf shrub
<i>Euphorbiaceae</i>	<i>Euphorbia restricta</i> R.A.Dyer	Rare	Dwarf shrub
<i>Hyppoxidaceae</i>	<i>Hyppoxis hemerocallidea</i> Fisch., C.A.Mey. & Avé-Lall.	Declining	Geophyte
<i>Iridaceae</i>	<i>Crocoshmia masoniorum</i> (L.Bolus) N.E.Br.	VU	Geophyte
<i>Ophioglossaceae</i>	<i>Ophioglossum gracillimum</i> Welw. ex Hook. & Baker	EN	Geophyte

The definitions of the conservation status are provided in **Table 12** below.

Table 12: Definitions of Red Data Status

Symbol	Status	Description
CR	Critically Endangered	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five International Union for Conservation of Nature (IUCN) criteria for Endangered, and is therefore facing a very high risk of extinction in the wild.
EN	Endangered	A taxon is Endangered when the best available evidence indicates that it meets any of the five IUCN criteria for Endangered, and is therefore facing a very high risk of extinction in the wild
VU	Vulnerable	A taxon is Vulnerable when the best available evidence indicates that it meets any of the five IUCN criteria for Vulnerable and it is therefore considered to be facing a high risk of extinction in the wild.
NT	Near Threatened	A taxon is Near Threatened when available evidence indicates that it is close to meeting any of the five IUCN criteria for Vulnerable and it is therefore likely to qualify for a threatened category in the near future.
	Declining	A taxon is Declining when it does not meet any of the five IUCN criteria and does not qualify for the categories Critically Endangered, Endangered, Vulnerable or Near Threatened, but there are threatening processes causing a continuing decline in the population.
	Rare	A taxon is Rare when it meets any of the four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to the five IUCN.

The flora species recorded in the study area are listed in the Terrestrial Ecological Impact Assessment is contained in **Appendix E5**.

During the field surveys, no threatened plant species were observed on site but only one (1) species of conservation significance was noted, namely *Boophone disticha* (Century plant). According to Raimondo *et al.* (2009), this species is listed as *Declining* and this species must be removed prior construction activities to area with suitable survival and growth-enabling conditions. Of the protected tree species that are known to occur within the region, only one tree, namely Marula tree (*Sclerocarya birrea* subsp. *caffra*) was recorded during the field assessment.

14.10 Fauna

The information to follow was sourced from the Terrestrial Ecological Impact Assessment (see **Appendix E5**). Refer to **Sections 15.4** and **16.8.2** for a synopsis of the study and a related impact assessment, respectively.

14.10.1 Mammals

According to the Animal Demography Unit (http://vmus.adu.org.za/vm_sp_list.php) (ADU, 2018) the potential mammal species that could occur in the 2329CD grid, are presented in **Table 13**.

Table 13: Mammal species recorded in the grid cell 2329CD (ADU, 2019)

Family	Genus	Species	Subspecies	Red list category
Bovidae	<i>Aepyceros</i>	<i>melampus</i>		Least Concern
Bovidae	<i>Alcelaphus</i>	<i>caama</i>		Least Concern
Bovidae	<i>Connochaetes</i>	<i>taurinus</i>	<i>taurinus</i>	Least Concern
Bovidae	<i>Damaliscus</i>	<i>lunatus</i>		Least Concern (IUCN 2008)
Bovidae	<i>Hippotragus</i>	<i>niger</i>		Not listed
Bovidae	<i>Kobus</i>	<i>ellipsiprymnus</i>		Not listed
Bovidae	<i>Raphicerus</i>	<i>campestris</i>		Least Concern
Bovidae	<i>Redunca</i>	<i>arundinum</i>		Least Concern
Bovidae	<i>Redunca</i>	<i>fulvorufula</i>		Least Concern
Bovidae	<i>Sylvicapra</i>	<i>grimmia</i>		Least Concern
Bovidae	<i>Tragelaphus</i>	<i>angasii</i>		Least Concern
Bovidae	<i>Tragelaphus</i>	<i>oryx</i>		Least Concern
Bovidae	<i>Tragelaphus</i>	<i>scriptus</i>		Least Concern
Bovidae	<i>Tragelaphus</i>	<i>strepsiceros</i>		Least Concern
Canidae	<i>Canis</i>			Not listed
Canidae	<i>Canis</i>	<i>mesomelas</i>		Least Concern
Cercopithecidae	<i>Cercopithecus</i>	<i>pygerythrus</i>	<i>pygerythrus</i>	Least Concern
Chrysochloridae	<i>Neamblysomus</i>	<i>julianae</i>		Vulnerable
Equidae	<i>Equus</i>	<i>quagga</i>		Not listed
Giraffidae	<i>Giraffa</i>	<i>camelopardalis</i>	<i>camelopardalis</i>	Least Concern
Giraffidae	<i>Giraffa</i>	<i>camelopardalis</i>	<i>giraffa</i>	Least Concern
Herpestidae	<i>Atilax</i>	<i>paludinosus</i>		Least Concern
Herpestidae	<i>Herpestes</i>	<i>sanguineus</i>		Least Concern
Hyaenidae	<i>Hyaena</i>	<i>brunnea</i>		Near Threatened
Hystricidae	<i>Hystrix</i>	<i>africaeaustralis</i>		Least Concern
Pedetidae	<i>Pedetes</i>	<i>capensis</i>		Least Concern
Sciuridae	<i>Paraxerus</i>	<i>cepapi</i>		Least Concern
Suidae	<i>Phacochoerus</i>	<i>africanus</i>		Least Concern
Vespertilionidae	<i>Neoromicia</i>	<i>capensis</i>		Least Concern

The mammal species that were recorded during the field survey, are listed in in the Terrestrial Ecological Impact Assessment (see **Appendix E5**).

Mammals recorded were common and are of no conservation importance in the area. Mole hills, which indicate the presence of moles on site, were also observed in abundance. No mammal species of conservation significance were noted on site.

14.10.2 Avifauna

Refer to **Figure 27** for Important Bird and Biodiversity Areas (IBA). The Polokwane Nature Reserve IBA is situated approximately 1.4 km south-west of the proposed site.

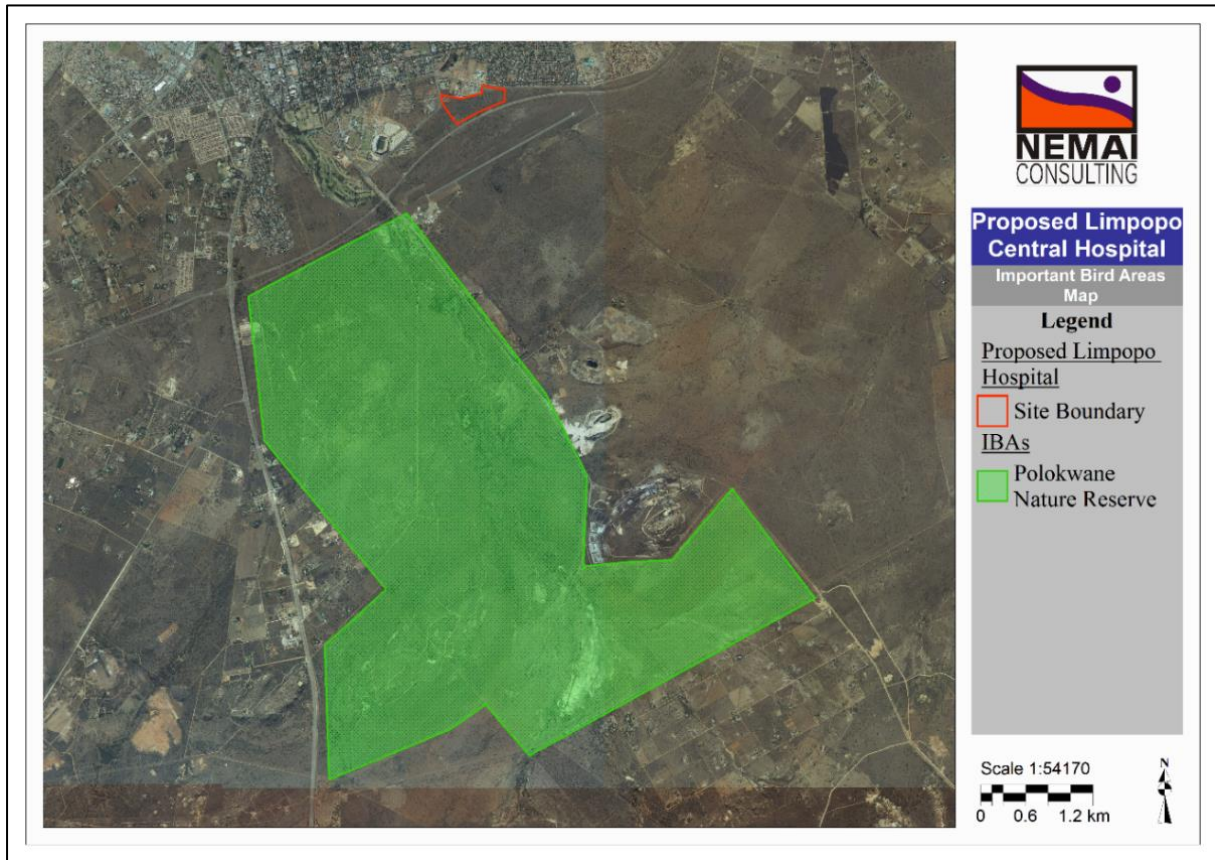


Figure 27: Important Bird Areas Map

According to the Southern African Bird Atlas Project 2 (SABAP 2), the red data bird species that could potentially occur in the quarter degree square 2329CD, is indicated in **Table 14** below.

Table 14: Red Data Listed bird species which could potentially occur on site (SABAP2)

Species Code	Common Name	Red list category
84	Black Stork	Near Threatened
88	Saddle-billed Stork	Endangered
90	Yellow-billed Stork	Near Threatened
92	Southern Bald ibis	Vulnerable
97	Lesser Flamingo	Near Threatened
118	Secretarybird	Near Threatened
122	Cape Vulture (Griffon)	Vulnerable
140	Martial Eagle	Vulnerable
172	Lanner Falcon	Near Threatened
183	Lesser Kestrel	Vulnerable
208	Blue Crane	Vulnerable

233	White-bellied Korhaan	Vulnerable
242	Greater Painted-snipe	Near Threatened
430	Half-collared Kingfisher	Near Threatened
501	Short-clawed Lark	Near Threatened

Nineteen (19) bird species were recorded during the field survey. Species recorded were common and widespread and typical of savanna biome. No Red Data bird species associated with the study site were recorded. The bird species that were recorded during the field survey, are listed in in the Terrestrial Ecological Impact Assessment (see **Appendix E5**).

14.10.3 Reptiles

According to the data sourced from the South African Reptile Conservation Assessment (ADU, 2016) for the grid cell 2329CD, no species of conservation concerns are known to occur in the vicinity of the proposed development site.

Large areas surrounding the proposed development site have resulted in increased habitat modification and transformation as well as increased human presence and associated disturbances (illegal reptile collecting, indiscriminate killing of all snake species, frequent fires) surrounding the site, coupled with increased habitat destruction and disturbances on the neighbouring properties are all causal factors in the alteration and disappearance of reptile diversity in the area (Jacobsen, 2005).

The study area supports limited suitable habitat for any arboreal species but provided suitable habitat for terrestrial reptile species such as Ground Agama, Yellow throated Plated Lizard, Montane Speckled or Striped Skink as well as snake species (Rinkhals, Mole Snake, and Black-headed Centipede Eater. A Distant's Ground Agama (*Agama aculeata* subsp *distanti*) reptile species was recorded on the proposed development site.

14.10.4 Amphibians

According to the Frog Atlas of Southern African (http://vmus.adu.org.za/vm_sp_list.php), frog species that were recorded in the 2329CD grid are shown in **Table 15** below.

Table 15: Amphibian species recorded which could occur in the study area

Family	Genus	Species	Common Name	Red list category
Pyxicephalidae	<i>Pyxicephalus</i>	<i>adpersus</i>	Giant Bull Frog	Near Threatened

14.11 Socio-Economic Environment

14.11.1 General

A Socio-Economic Impact Assessment (see **Appendix E4**) was undertaken for the project. Refer to **Sections 15.7** and **16.9.2** for a synopsis of the study and a related impact assessment, respectively.

Findings from the Socio-Economic Impact Assessment were used to update the subsections to follow.

14.11.2 Population, Age and Gender

The total population for the two wards is 29 886 persons (**Table 16**). The sub-places that are densely populated are located in the urban edge and include Polokwane Central and Flora Park who have 12 825 and 11 562 persons in the respective areas. The populations Pietersburg Vliegvelde and Pietersburg Wildreseaat are almost insignificant at 42 and 69 persons living in each sub-place respectively.

Table 16: Population, Age and Gender in 2011

Sub-Place	Population	Population (%)
Polokwane Central	12 825	43%
Capricorn	771	3%
Fauna Park	4 161	14%
Flora Park	11 562	39%
Polokwane Ext 24	456	2%
Pietersburg Vliegvelde	42	0%
Pietersburg Wildreseaat	69	0%
Total	29 886	100%

The age group 15 – 64 is defined as the working age population (**Figure 28**). In total, this group accounts for seventy-four percent of the population in the study area. The population is fairly young, with over sixty percent below the age of 35. The gender data is representative of the South African Population which has slightly more females (fifty-one percent) than males (forty-nine percent).

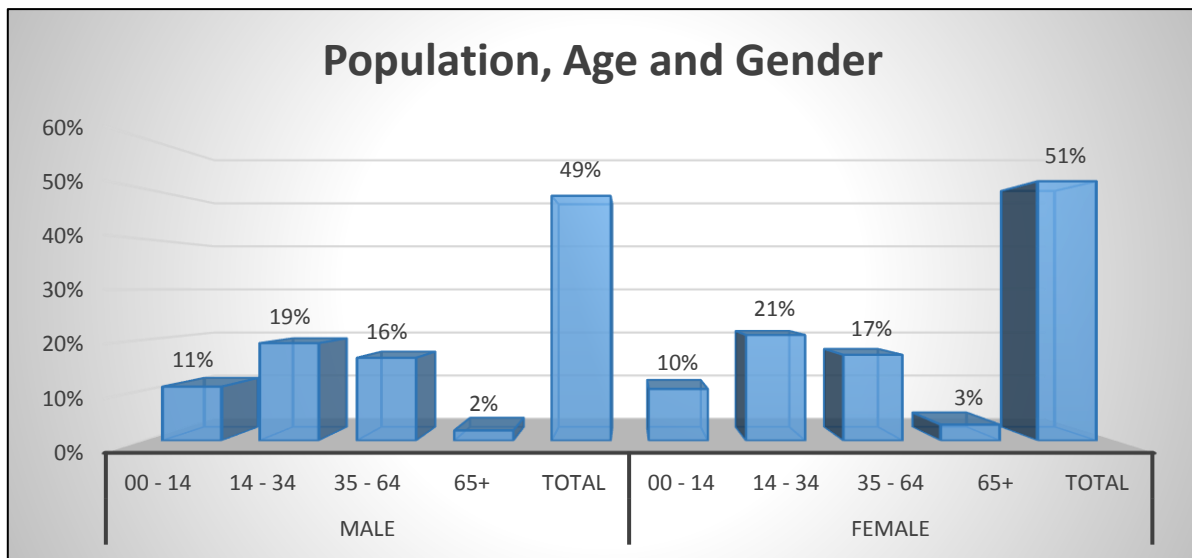


Figure 28: Population, age and gender in study area for 2011 (Statistics South Africa, 2013)

14.11.3 Language

Most people in the Polokwane LM speak Sepedi as the first language at 80%, Afrikaans at 5%, English at 3% and the other languages make up for the other 11%. Refer to **Table 17**.

Table 17: Languages (Statistics South Africa, 2013)

Language	Percentage
Sepedi	78,7%
Afrikaans	5,3%
English	3,1%
Xitsonga	2,8%
Tshivenda	2,1%
Not Applicable	2,1%
IsiNdebele	0,9%
Sesotho	0,8%
Setswana	0,7%
IsiXhosa	0,2%
Sign Language	0,2%
SiSwati	0,2%
Other	1.9%
IsiZulu	1%

14.11.4 Education

Education levels are assessed in order to understand the potential grade or level of employment as well as livelihood of the community. Furthermore, it indicates the functional literacy and skill level of a community. **Figure 29** below shows the highest level of education reached by persons over age 20 in the study area in 2011.

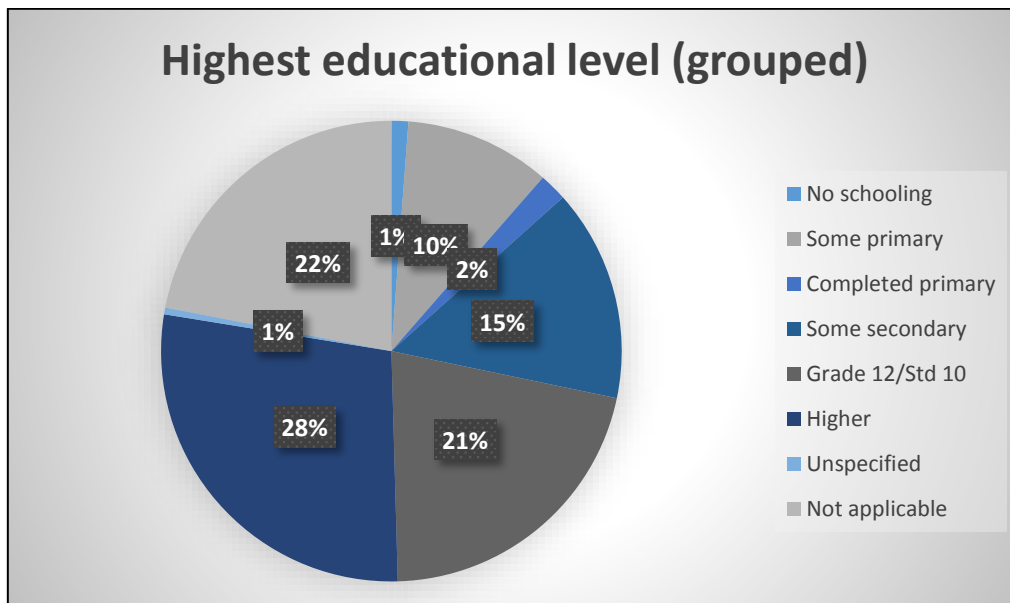


Figure 29: Highest level of education reached by persons in the study area (age 20+)

Education levels in the study area are quite high when considering education data for South Africa. Twenty-one percent of the population over age 20 has received a matric and a further twenty-eight percent have some form of higher qualification. In South Africa as a whole, only eighteen percent of the population have a matric while seven percent have higher education.

Thirteen percent of the population have no education or have not completed primary education and are considered to be functionally illiterate. Functional illiteracy is defined as a person who has received skills to read and write that are inadequate to manage daily living and employment tasks that require reading skills beyond a basic level. Usually persons who have a low level of education, up to primary education, are classified as functionally illiterate.

Economic theory proves that education improves the level and quality of human capital, in turn increasing the productivity of individuals. Thus, increasing the output generated per worker. Education facilitates long term growth and is critical to escape the poverty trap.

Economic theory is proven in practice in a study conducted by Altbeker and Storme (2013). The study shows that while the number of graduates in South Africa has more than doubled in the past fifteen years; the unemployment rate amongst graduates has declined to around five percent.

Furthermore, the study shows that the change of employment increases as the years of education increase. **Figure 30** below is a graph taken from the Altbeker and Storme study that shows the labour force participation (LFP), employment and unemployment rates by years of education in 2007 (Altbeker and Storme, 2013). It demonstrates that only thirty-three percent of those who had less than secondary education (eleven years or fewer) had jobs. This rose by twenty percent on completion of secondary school. With one extra year of education after secondary school, employment increased to seventy-one percent. Those with higher education again enjoyed ten percent rise in employment while post-graduate degree holder's employment was the highest at ninety-six percent.

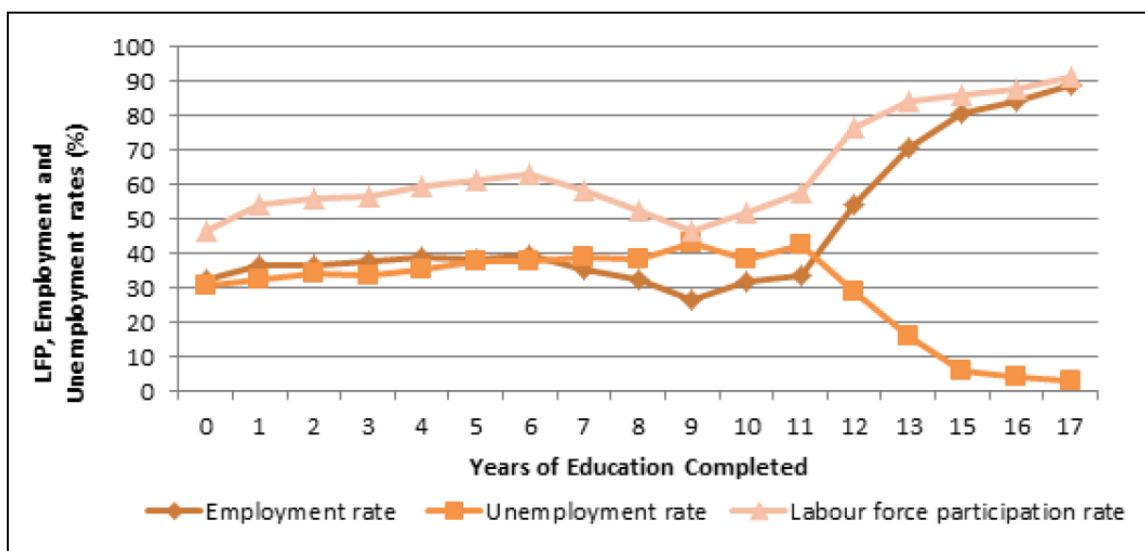


Figure 30: Labour force participation, employment and unemployment rates by years of education (2007)

The Altbeker and Storme study, in conjunction with the data shown above, reveal that education levels in the study area are so low and to a large extent the communities are structurally geared towards unemployment and thus poverty. The community is economically dependent on the forty-four percent of the population who have completed high school or higher education. It is only this group that is likely to earn an income in the middle or high income bracket, resulting in a perpetuating cycle of low education and low income levels.

14.11.5 Dwelling

The characteristics of the dwellings in which households live and their access to various services and facilities provide an important indication of the well-being of household members. It is widely recognised that shelter satisfies a basic human need for physical security and comfort. According to the Statistics South Africa household classification, the following definitions apply to formal and informal housing (**Figure 31**):

- ❖ **Formal dwelling** refers to a structure built according to approved plans, i.e. house on a separate stand, flat or apartment, townhouse, room in backyard, rooms or flatlet elsewhere. Contrasted with informal dwelling and traditional dwelling; and
- ❖ **Informal dwelling** is a makeshift structure not erected according to approved architectural plans, for example shacks or shanties in informal settlements or in backyards.

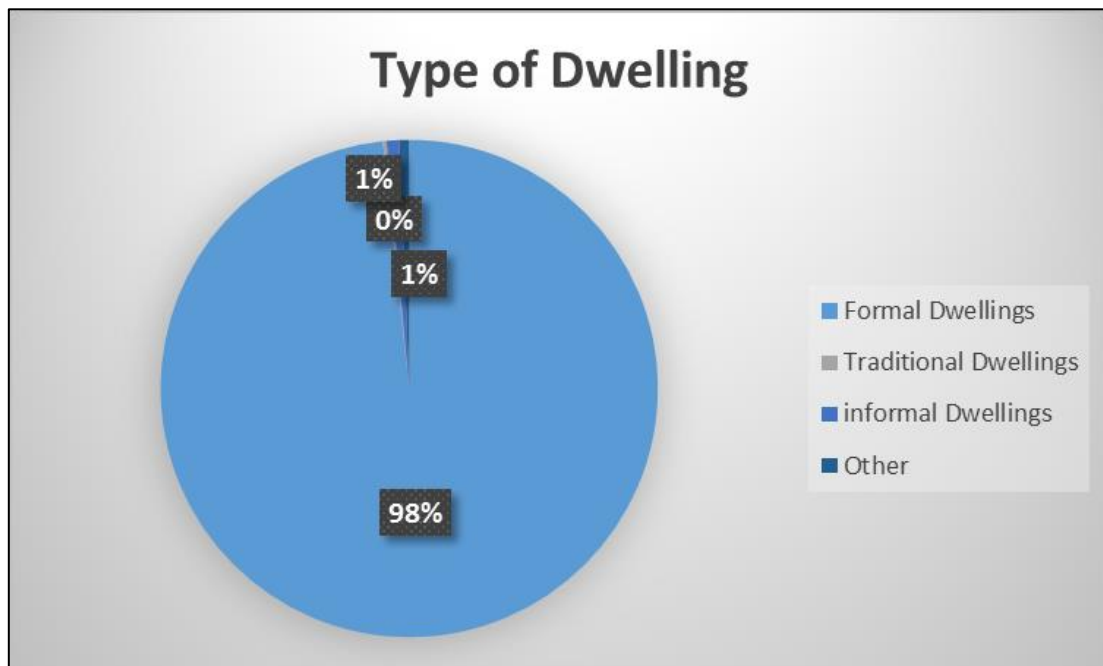


Figure 31: Dwelling Type (Statistics South Africa, 2013)

Majority of the households in the wards have formal dwellings with close to ninety-eight percent of dwellings being houses on a separate stand or yard on a farm.

14.11.6 Annual Household Income

Annual household income is important to assess as it provides information on the poverty level of the community. Unskilled communities tend to generate low incomes to the household, which contributes to poverty (**Figure 32**).

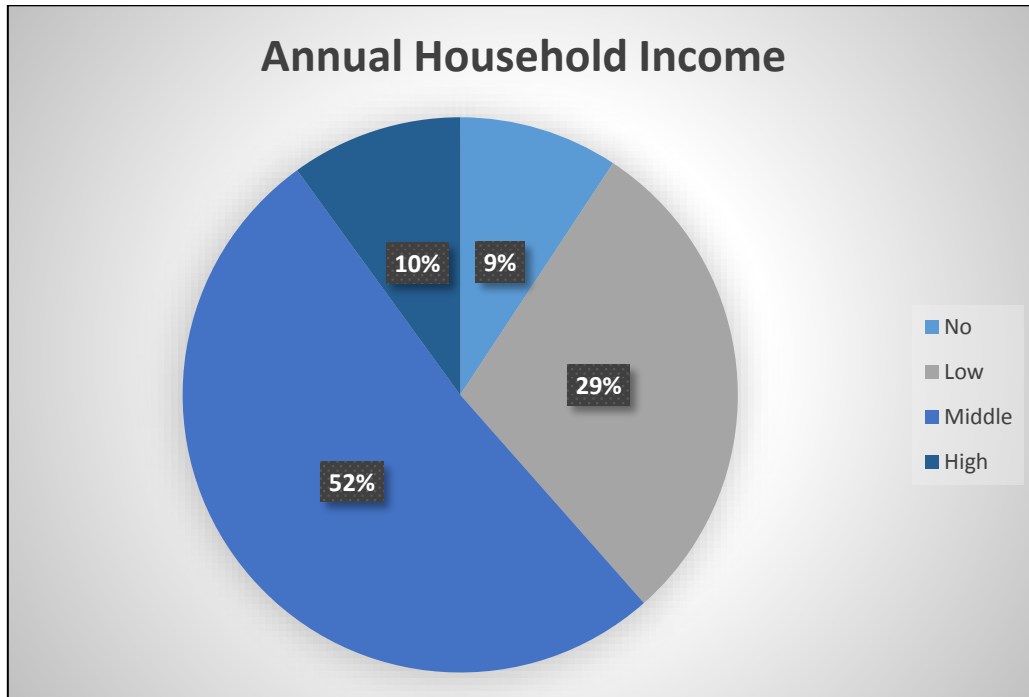


Figure 32: Annual Household Income in the study area (2011) (Statistics South Africa, 2013)

Nine percent of households in the study area receive no income. Twenty-nine percent of household earn in the lower income category. Combined, these two categories indicate that approximately forty-percent of households in the study area live in or are close to poverty.

Polokwane is a wealthy city in comparison to South Africa. Fifty-two percent of households each in the middle income category and ten percent of households have a high income.

14.11.7 Access to piped water

Understanding the water supply provides insight into the municipal level of service of a community as well on the standard of living (**Figure 33**).

Access to piped (tap) water is important to understand the level of health and standard of living in an area. In each of the wards, while household have access to piped water within the basic level of service, there is a need for improvement of water services in the study area as four percent households have no access to water services.

Ninety-five percent of households have access to piped water inside the dwelling while five percent of households have access to water through a yard connection. The sub-places that form the study area have access to piped water.

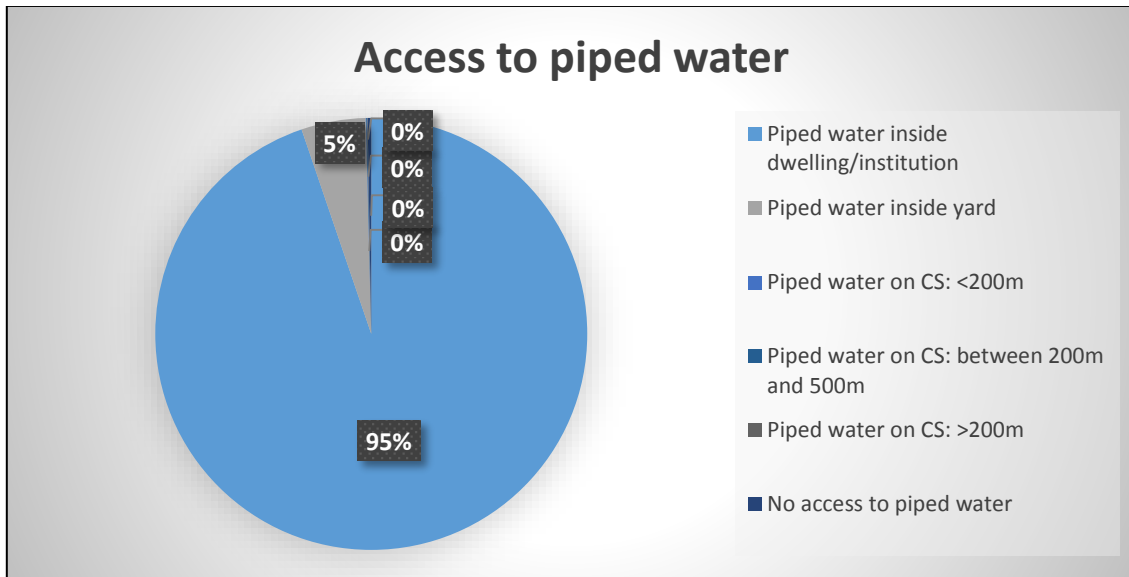


Figure 33: Access to pipes water

14.11.8 Health Care

There are over fifty health care facilities in Polokwane Local Municipality. According to the Polokwane Local Municipality, the main health care facilities in the municipality are listed in **Table 18** below:

Table 18: Health Care Facilities within Polokwane LM

Type of Facility	Name of facility	Location in Municipality
Regional Hospitals	Polokwane Mankweng Hospital Complex	Polokwane
	Mankweng Hospital	Sovenga
	Mokopane Hospital	Mokopane
District Hospitals	Voortrekker Hospital	Mokopane
	Botlokwa Health Centre	Dwarsriver
	Lebowakgomo Hospital	Chuenespoort
	Seshego Hospital	Seshego
	W.F.Knobel Hospital	Lonsdale
	Zebediela Hospital	Gompies
Specialized/ Psychiatric Hospitals	Thabampoopo Hospital	Chueniespoort
Private Hospitals	Limpopo Medi-Clinic	Polokwane
Clinics	Buite Street Clinic	Polokwane
HIV/Aids Training, Information and Counselling Centres	HIV/Aids Centre	Polokwane
	Environmental Health Inspectorate	Polokwane

In total Polokwane has nineteen public health clinics and two public hospitals. There are a number of public and private health care facilities in Polokwane.

14.11.9 Refuse Disposal

Majority of people make use of their own refuse dumps for refuse disposal, followed by refuse removed by local authority/private company at least once a week (see **Table 19**).

Table 19: Refuse disposal (Statistics South Africa, 2013)

Refuse Disposal	Percentage
Removed by local authority/private company at least once a week	44,4%
Removed by local authority/private company less often	0,7%
Communal refuse dump	1%
Own refuse dump	49,9%
No rubbish disposal	3,2%
Other	0,7%

14.11.10 Land Claims

The land claims in the district, based on the IDP (Capricorn IDP, 2016) are shown in **Figure 34**. Areas with land claims are situated predominantly south of the proposed site.

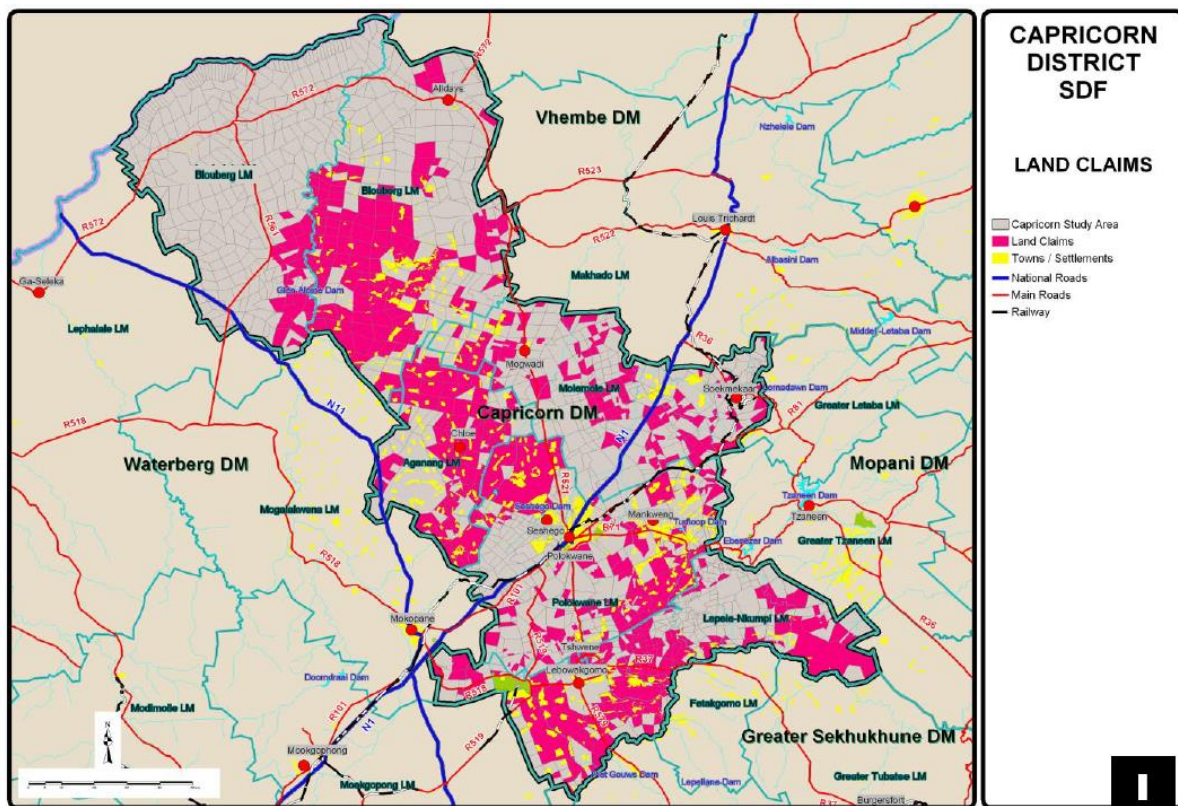


Figure 34: Land Claims (Capricorn IDP, 2016)

14.12 Agriculture

An Agricultural Impact Assessment (**Appendix E1**) was conducted for the project. Refer to the summary and impact assessment of this study contained in **Sections 15.6** and **16.10**, respectively.

14.12.1 Land Capability

The proposed site falls within areas classified as being moderate potential arable land (see **Figure 35**).

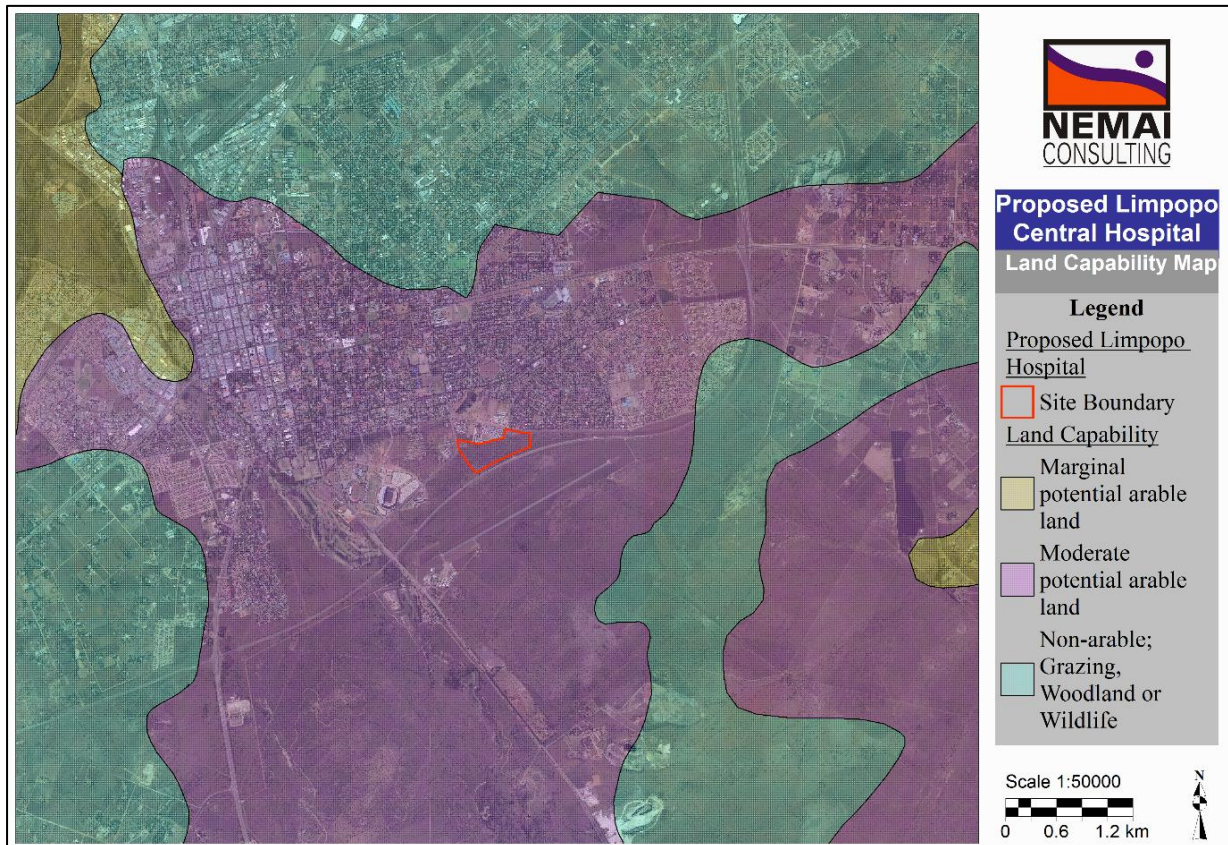


Figure 35: Land Capability Map

Based on the findings of the Agricultural Impact Assessment (see **Appendix E1**), it was indicated that in terms of agricultural potential of the proposed site, the soils are suitable for dryland and irrigated crop production activities and are therefore considered to be of moderate to high agricultural potential.

However, the urban nature of the surrounding developments as well as the fact that the site is enclosed by developments and national roads, and therefore limited to 21 ha in size, yields that it does not constitute a viable agricultural entity. This observation is underpinned by the fact that land users on the site would have to pay municipal rates and taxes.

14.13 Air Quality

The proposed site is situated in an urban area, and thus the air pollution sources in the project region include the following (not limited to):

- ❖ Municipal landfills (odours, methane, etc.)
- ❖ Vehicle tailpipe emissions;
- ❖ Vehicle entrainment of dust from paved roads;
- ❖ Industrial activities;
- ❖ Illegal dumping activities; and
- ❖ Veld fires.

14.14 Noise

Due to the urban setting, the noise in the region emanates primarily from the following sources:

- ❖ The use of vehicles on the N1, local and residential roads surrounding the proposed site;
- ❖ Schools situated adjacent to the proposed site;
- ❖ Occasional events held at the Peter Mokaba Stadium, which is situated approximately 1 km west of the proposed site; and
- ❖ Operation of the Polokwane Civil Airport, situated approximately 500 m south of the site.

14.15 Historical and Cultural Features

A Phase 1 Heritage Impact Assessment (see **Appendix E3**) was undertaken for the project in accordance with the National Heritage Resources Act (Act No. 25 of 1999) (NHRA).

14.15.1 **Archival Findings**

Refer to the summary of the history of the study area, provided in the Phase 1 Heritage Impact Assessment (see **Appendix E3**)

14.15.2 **Palaeontology**

The Palaeontological (Fossil) Sensitivity Map (see **Figure 36**) was sourced from the South African Heritage Resources Information System (SAHRIS).

Table 20: Palaeontological Sensitivity Classification Table (SAHRIS)

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required

BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.



Figure 36: Palaeontological Sensitivity (SAHRIS, 2016)

Based on **Table 20** and the findings presented in **Figure 36**, the study area is underlain by insignificant palaeontology with a small section in the north-western corner that is rated as low significance. No further palaeontological studies are required however a protocol for incidental palaeontological finds is required. This protocol should include the termination of all development work if any palaeontological finds are discovered, and that SAHRA and a palaeontologist should be alerted to determine the way forward.

Refer to **Sections 15.5** and **15.5.4** for a synopsis and main findings from the Phase 1 Heritage Impact Assessment, respectively.

14.16 Planning

14.16.1 General

According to the Capricorn IDP, the Capricorn DM (DC35) is situated in the centre of the Limpopo Province, sharing its borders with four district municipalities namely; Mopani (east),

Sekhukhune (south), Vhembe (north) and Waterberg (west). The district is situated at the core of economic development in the Limpopo Province and includes the capital of the province, the City of Polokwane.

Polokwane Local Municipality is the local municipality located within CDM. It shares its name with the city of Polokwane and also a host to the city. Polokwane city is the capital and the major urban centre of the Limpopo Province. It is also referred to as the “Place of Safety”. Polokwane lies roughly halfway between Gauteng (300 km) and the Zimbabwean border (200 km) on the N1 highway, which connects Zimbabwe with the major cities of South Africa, such as Pretoria, Johannesburg, Bloemfontein and Cape Town.

The municipality has the highest population density of 167/km² and total population of 628 999. About 49.9% of the district population resides within Polokwane Municipal boundaries mainly because it is the economic hub of Limpopo. In terms of its physical composition, Polokwane Municipality is 23% urbanised and 71% rural. The municipality comprises of 38 wards and covers a total area of 3 766km². The proposed site falls within ward 20, and neighbours ward 22.

14.16.2 Limpopo SDF

The Limpopo SDF is dated September 2007. It is the highest order framework in the province and the District SDF must comply with the proposals contained in this SDF. The SDF indicates the following elements:

- ❖ Infrastructure;
- ❖ Nodes;
- ❖ Environmentally sensitive areas
- ❖ Corridors: Four corridors are identified as Strategic Development Initiatives. Two of these impact on the District: the Trans-Limpopo Corridor along the N1 and the east-west Corridor from Polokwane via Lephale to Botswana.
- ❖ Health facilities
- ❖ Police stations

14.16.3 Capricorn SDF

The Capricorn District IDP (2016) indicates the following (see **Figure 37**):

- ❖ Towns and settlements;
- ❖ Mining areas;
- ❖ Nature reserves and conservation areas;
- ❖ Corridors (East West, Dilokeng, Phalaborwa, and Trans Corridors)
- ❖ Industrial, urban and rural nodes/growth points; and
- ❖ Tourism precincts.

The proposed site is situated in zones categorised as an urban node/provincial growth point.

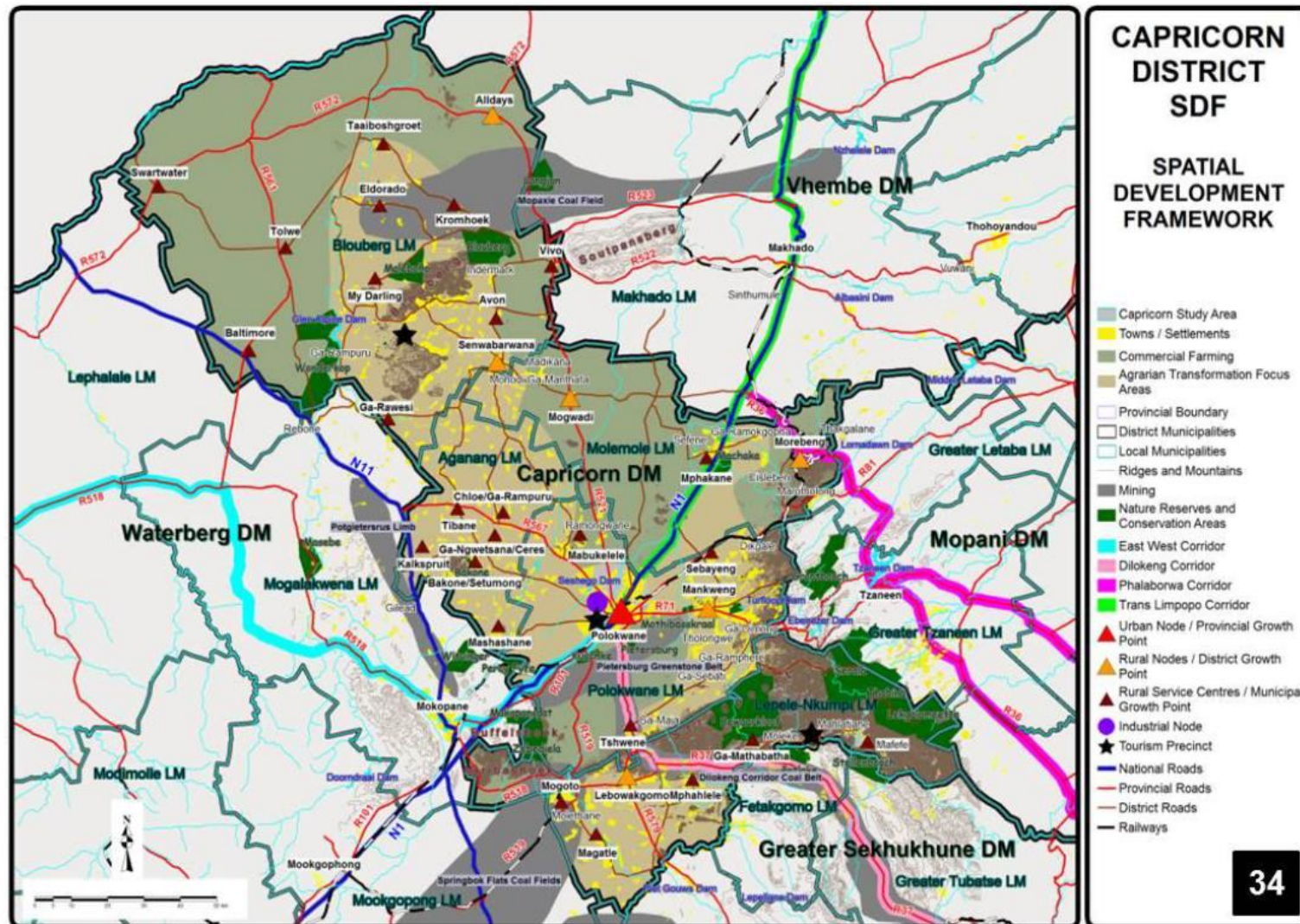


Figure 37: Capricorn DM SDF (Capricorn IDP, 2016)

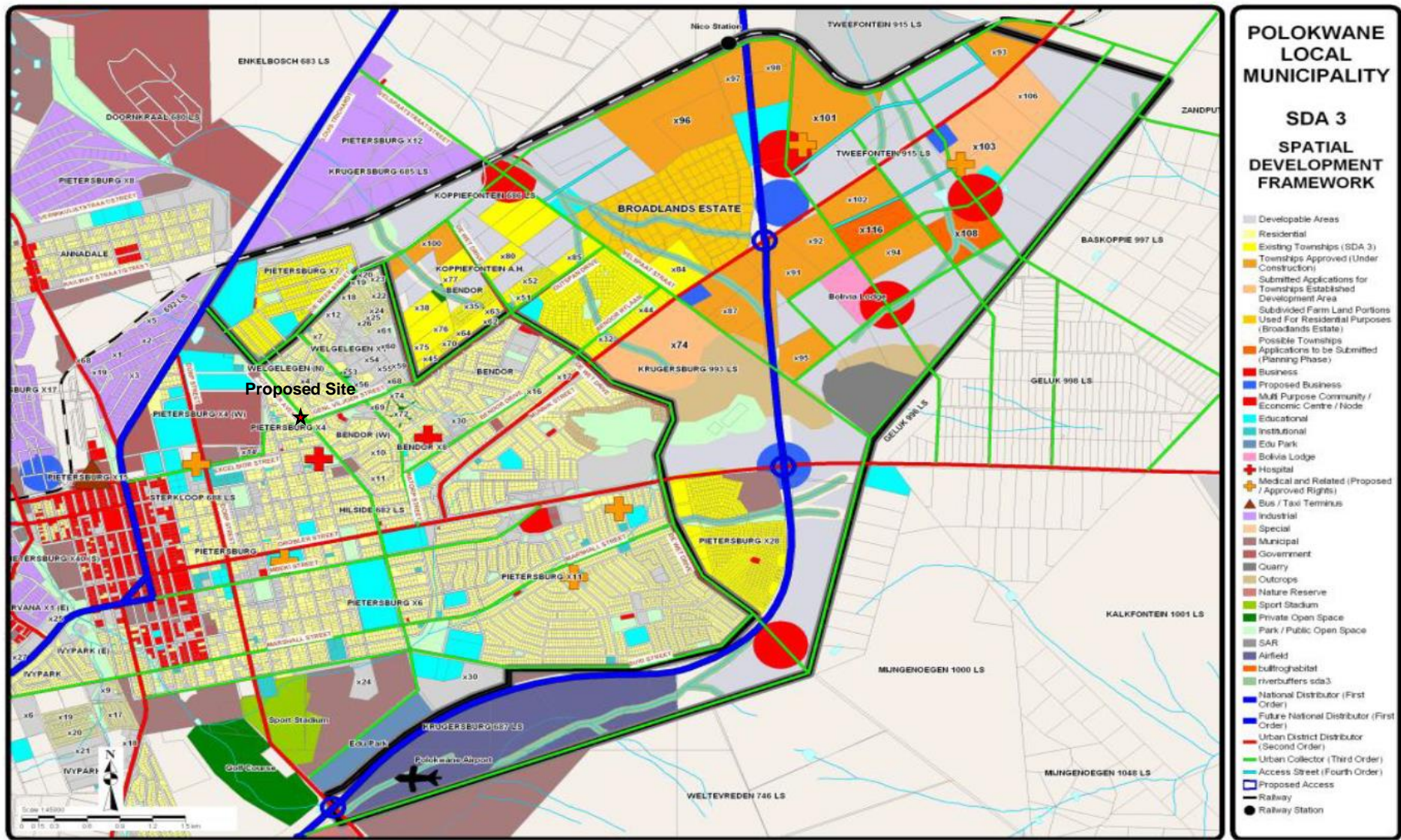


Figure 38: Polokwane LM SDF, 2010

14.16.4 Polokwane LM SDF

According to the Polokwane SDF, dated 2010 (amended in 2017) the proposed site is situated in areas categorised as a 'developable area' (Figure 38).

14.17 Existing Structures and Infrastructure

The following physical features surrounding the site may be affected by the proposed development:

- Local and residential roads;
- Telephone lines;
- Power lines;
- Fencing erected on the neighbouring properties;
- Schools (Northern Academy Secondary School, New Horizon School and Edupark Campus). Refer to Figure 39.

The Agricultural Impact Assessment (see Appendix E1) further indicated that in terms of current activities, developments and buildings, the site itself is not characterised by any buildings or developments, however the surrounding areas are characterised by distinct and intensive urban development and expansion.



Figure 39: Existing infrastructure surrounding proposed site

14.18 Transportation

The major transportation surrounding the site is provided in Figure 40. The N1 (Polokwane Bypass) is situated south of the site, and residential roads: Webster Street to the west and Suid Street to the east of the site.

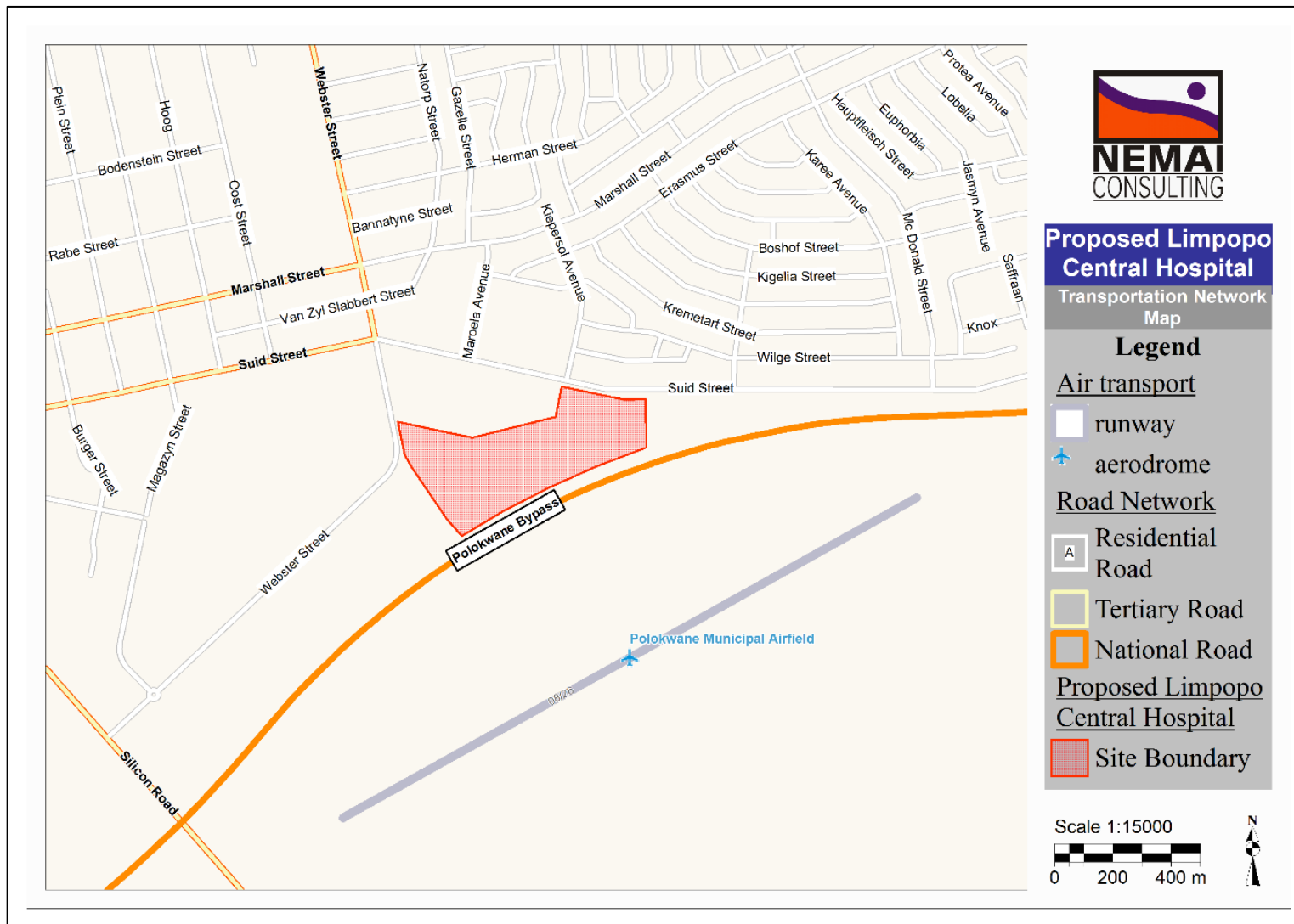


Figure 40: Major Transportation Network Map

14.19 Waste Disposal Facilities

According to the Polokwane LM (Polokwane IDP, 2018) the municipality also has 5 transfer stations (Figure 41).

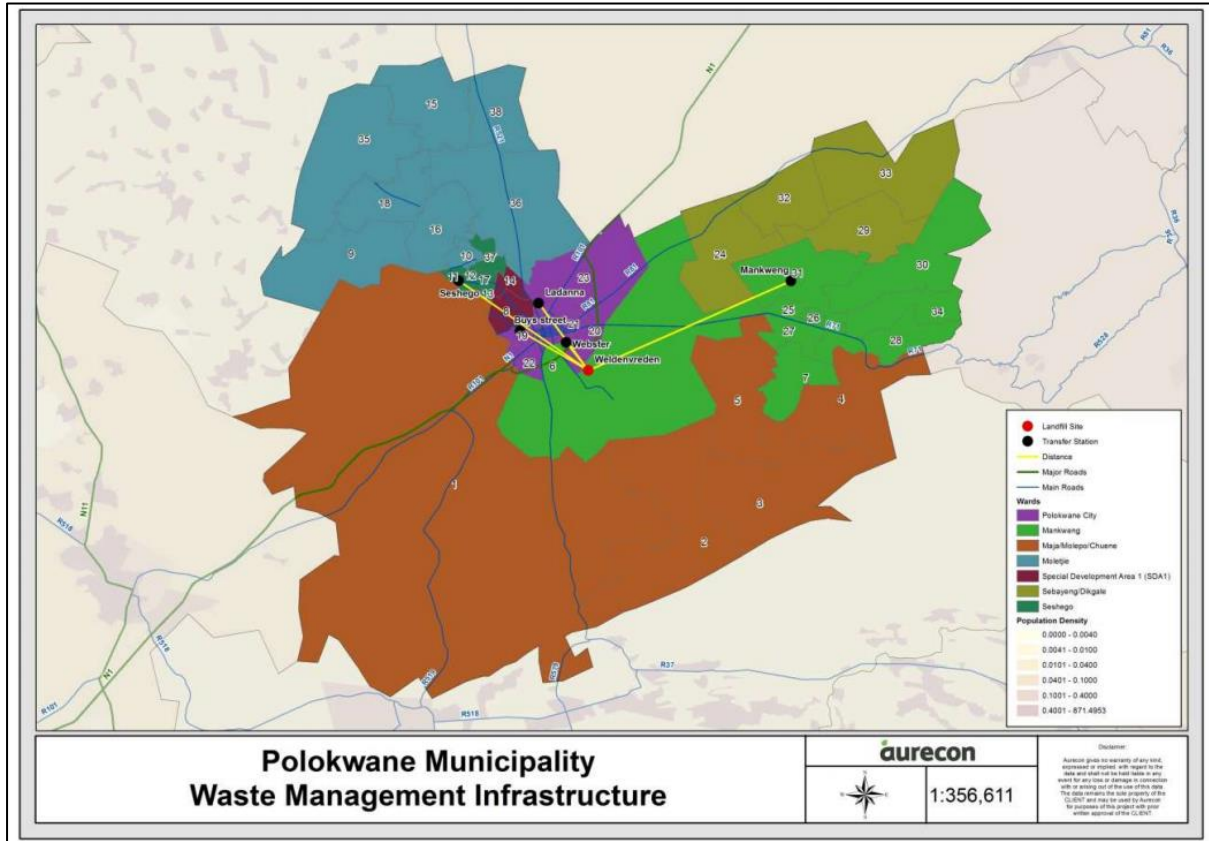


Figure 41: Waste Infrastructure (Polokwane IWMP, 2016)

According to the Capricorn DM (Capricorn IDP, 2018) and Polokwane LM Integrated Waste Management Plan (IWMP) (Polokwane IWMP, 2016), Polokwane LM has the permitted Weltevreden Landfill, which is operational, and the Mankweng dumping site, which is not permitted and has to be closed and rehabilitated.

14.20 Aesthetic Qualities

The visual character of the landscape where the proposed site is planned, is open veld. However, it is surrounded by urban development (schools, national/residential roads and power lines). The site has been degraded by past illegal dumping activities, as seen in Figure 42.



Figure 42: Illegal dumping activities on site (top) and general appearance of site (bottom)

15 SUMMARY OF SPECIALIST STUDIES

15.1 Specialist Studies undertaken as part of the EIA

A crucial element of the Plan of Study for the EIA prepared during the Scoping phase was to provide the Terms of Reference for the requisite specialist studies triggered during Scoping.

According to Münster (2005), a 'trigger' is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*".

The requisite specialist studies 'triggered' by the findings of the Scoping process, aimed at addressing the key issues and compliance with legal obligations, include:

1. Riparian Habitat and Wetland Delineation Impact Assessment;
2. Terrestrial Ecological Impact Assessment;
3. Heritage Impact Assessment;
4. Agricultural Impact Assessment;
5. Socio-Economic Impact Assessment

15.2 Incorporation of Findings from the Specialist Studies

The information obtained from the respective specialist studies was incorporated into the EIA report in the following manner:

1. The assumptions and limitations identified in each study were included in **Section 10**;
2. The information provided in the specialist studies were used to update and complete the description of the receiving environment (**Section 14**) in a more detailed and site-specific manner;
3. A synopsis of each specialist study is contained in the sub-sections to follow (**Sections 15.3 – 15.7**), focusing on the approach to the study, key findings, conclusions and recommendations;
4. The specialists' impact assessments were included in the overall project impact assessment, contained in **Section 16**, and mitigation measures provided were included in the EMPr contained in **Appendix H**;
5. Where necessary, specialist input was obtained to address comments made by IAPs that related to specific environmental features pertaining to each specialist discipline; and
6. Salient recommendations made by the specialists were taken forward to the final EIA Conclusions and Recommendations (**Section 19**).

15.3 Riparian Habitat and Wetland Delineation Impact Assessment

A summary of the Riparian Habitat and Wetland Delineation Impact Assessment (The Biodiversity Company, 2019), as contained in **Appendix E2**, follows. Refer to **Section 16.7** for an assessment of the associated impacts.

15.3.1 Details of the Specialist

The details of the specialist that undertook the above-mentioned specialist study, follow.

Organisation:	The Biodiversity Company
Name:	Andrew Husted
Qualifications:	MSc – Aquatic Health
Affiliation (if applicable):	Professional Natural Scientist-Ecological Science (Reg number: 400213/11) with South African Council for Natural Scientific Professions (SACNASP)

15.3.2 Objectives of the Study

The following primary objectives were considered for the study:

- ❖ Assessing and delineating watercourses (riparian habitats and wetlands within a 500 m radius of project footprint) at varying levels of detail and rigour, based on the risks posed to the affected watercourses;
- ❖ Conduct a comprehensive desktop assessment for the local systems;
- ❖ Determine the baseline ecological status of the local watercourses and wetland systems where applicable;
- ❖ Conduct a risk assessment for the receiving systems in light of the proposed project. Where applicable provide suggestions to avoid impacts, and where impacts are unavoidable prescribe measures to mitigate these impacts; and
- ❖ Provide recommendations and a monitoring programme for the project.

15.3.3 Methodology

The following methodology was employed:

Aquatic Ecology:

The watercourses in the area are ephemeral systems with very short periods of flowing water. No flowing water was encountered during this dry season survey, and due to the fact that sampling could not be conducted a desktop assessment was conducted for this component of the study. The desktop assessment considered for the following datasets:

- ❖ A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub Quaternary Reaches for Secondary Catchments in South Africa. Draft. Compiled by RQS-RDM (DWS, 2013); and
- ❖ The National Freshwater Ecosystem Priority Areas (NFEPAs, 2011);

Wetland Assessment:

The National Wetland Classification System (NWCS, 2010) developed by the South African National Biodiversity Institute (SANBI) was considered for this study. This system comprises of a hierarchical classification process, defining a wetland based on the principles of the hydro geomorphic (HGM) approach at higher levels, and further includes structural features at the lower levels of classification (SANBI, 2009).

❖ Desktop Assessment –

- The desktop assessment consisted of relevant information as presented by the SANBI's Biodiversity Geographic Information Systems (BGIS) website (<http://bgis.sanbi.org>). Wetland specific information resources taken into consideration during the desktop assessment of the study area included:
 - Aerial imagery (Google Earth);
 - The National Freshwater Ecosystem Priority Areas (NFEPAs, 2011);
 - Limpopo Conservation Plan (C-Plan, 2013); and
 - Contour data.

❖ Wetland Delineation –

- The wetland areas were delineated in accordance with the DWAF (2005) guidelines. The outer edges of the wetland areas are identified by considering the following four specific indicators:
 - The Terrain Unit Indicator helps to identify those parts of the landscape where wetlands are more likely to occur;
 - The Soil Form Indicator identifies the soil forms, as defined by the Soil Classification Working Group (1991), which are associated with prolonged and frequent saturation;
 - The Soil Wetness Indicator identifies the morphological "signatures" developed in the soil profile as a result of prolonged and frequent saturation; and
 - The Vegetation Indicator identifies hydrophilic vegetation associated with frequently saturated soils.

❖ Wetland Classification –

- Eight primary HGM units are recognised for Inland Systems on the basis of hydrology and geomorphology (Ollis, Snaddon, Job, & Mbona, 2013). The terms have been used in order to ensure consistency with the wetland classification terms in South Africa.

❖ Present Ecological Status (PES) –

- The WET-Health tool was used to assess the health and integrity of a wetland.

15.3.4 Key Findings

A single dry season survey was conducted on the 4th of October 2016. The proposed Limpopo Academic Hospital is situated in the quaternary catchment A71A, within the Limpopo Water Management Area. The study area is located just south of Polokwane Central in the Limpopo Province, South Africa.

The focus for the study reaches associated with the Sand River which is in close proximity of the project area. The ecological status description for sub-quaternary catchment A71A-249 is provided in **Table 21** below:

Table 21: Present Ecological Status for the Sand River SQR A71A-249

SQR	Sand River SQR A71A-249
Present Ecological Status	Largely Modified (Class D)
Ecological Importance	High
Ecological Sensitivity	Moderate

The following summary is provided for the wetland component of the study:

- ❖ A & B Section channels identified for the study.
- ❖ No FEPA wetlands were identified within 500 m of the project area.
- ❖ No wetland CBAs or ESAs are associated with the project area.
- ❖ The dominant Soil Form in the project area is Glenrosa, not considered to be indicative of wetlands.

15.3.5 Impact Assessment

Refer to **Section 16.7.2** for the results from the impact assessment from this study.

15.3.6 Conclusions and Recommendations

The study attempted to assess the ecological state of the local river systems and identify and assess any wetland systems that may be affected by the project. Due to the ephemeral nature of the systems, no flowing water was available at the time of the survey. Desktop information indicates the systems within the larger reach area are in a largely modified state, with a high ecological importance and moderate ecological sensitivity.

No wetland areas were identified within the project area. The implementation of the wetland indicators was inhibited due to disturbances to the catchment area, specifically vegetation. In spite of this, no wetland soil forms or signs of saturation were encountered during the study in order to indicate there to be the presence of any wetlands.

Based on this assessment, the significance of the risks posed to any local watercourses was determined to be low. No watercourses will be directly impacted on by the project. It is the professional opinion of the specialist that the project be favourably considered.

15.4 Terrestrial Ecological Impact Assessment

A summary of the Terrestrial Ecological Impact Assessment (Nemai Consulting, 2019b), as contained in **Appendix E5**, follows. Refer to **Section 16.8** for an assessment of the associated impacts.

15.4.1 Details of the Specialist

The details of the specialist that undertook the above-mentioned specialist study, follow.

Organisation:	Nemai Consulting
Name:	Avhafarei Phamphe
Qualifications:	MSc – Botany
Affiliation (if applicable):	Professional Natural Scientist-Ecological Science (Reg number: 400349/12) with South African Council for Natural Scientific Professions (SACNASP) Professional member of South African Institute of Ecologists and Environmental Scientists (SAIEES) Professional member of South African Association of Botanists (SAAB)

15.4.2 Objectives of the Study

In order to achieve the aim stated above, the following objectives are to be achieved:

- ❖ To review literature in order to determine the diversity and eco-status of the plants, mammals, birds, and reptiles on or near the study area;
- ❖ To carry out a survey to gain an understanding of the diversity of taxa which inhabit the development footprint (study area), as well as the presence of unique habitats that might require further investigation or protection;
- ❖ To assess the current habitat condition and conservation status of plants and animals species on the study area;
- ❖ To assess the potential impacts that the proposed development may have on plant and animals on the study area;
- ❖ To list the species on site and to recommend necessary actions in case of the occurrence of endangered, vulnerable or rare species or any species of conservation importance; and
- ❖ To provide management recommendations to mitigate negative and enhance positive impacts on the study area.

15.4.3 Methodology

The methodology used included a comprehensive desktop review, utilising available provincial ecological data, relevant literature, GIS databases, topographical maps and aerial photography. This was then supplemented through a ground-truthing phase, where pertinent areas associated with the project footprint were visited during a field survey. The survey focused on flora (vegetation) and fauna (mammals, avifauna, reptiles and amphibians). Habitat suitability was assessed during the field surveys.

15.4.4 Key Findings

15.4.4.1 Flora

The proposed development site of Limpopo Academic hospital (referred to this report as the study area) falls within the Savanna Biome and this Biome is the largest Biome in South Africa and occupies over one third of the whole area. It is characterized by a grassy ground layer and distinct upper layer of woody plants. The study area is classified as falling within the Polokwane Plateau Bushveld vegetation type, with a conservation status of Least threatened.

The data sourced from the South African National Biodiversity Institute (SANBI) indicates that the proposed development does not fall within any of the terrestrial threatened ecosystems. According to the Limpopo Conservation Plan, the proposed development site falls mostly within the Other Natural Areas category (almost 95%) and a small portion within the No Natural Habitat remaining. No CBA 1, CBA 2, ESA 1 and ESA 2 were recorded on site.

Several *protected trees* have distributions that include the study area. Of note is the presence of *Sclerocarya birrea* subsp. *caffra* (Marula) recorded in abundance on site. This species is a nationally protected tree species, and the disturbance to which should be avoided where possible and in terms of Section 15(1) of the National Forests Act, 1998: *no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated.* A permit from Department of Agriculture, Forestry and Fisheries (DAFF) is required before construction commences in order to remove or disturb these protected trees identified on site.

During the field survey, no threatened plant species were observed on site but only one species of conservation importance were noted, namely *Boophone disticha* and this species has a conservation status of *Declining*. It is thus recommended that prior to construction, this species must be searched and rescued and then following construction activities, they must be re-established at the site.

15.4.4.2 Fauna

During the field survey, four (4) mammal species were recorded on site, namely Common Mole rat, Bushveld gerbil, House rat and Cape ground squirrel. Mammals recorded were common and are of no conservation importance in the area. No Red data mammal species were noted on site.

The nearby Polokwane Nature Reserve IBA, which is situated less 1.4 Km away from the proposed development site, houses many of the bird species which could utilise the proposed development for foraging. Nineteen (19) bird species were recorded during the field survey. Species recorded were common and widespread and typical of savanna biome. No Red Data bird species associated with the study site were recorded.

According to the data sourced from the South African Reptile Conservation Assessment, for the grid cell 2329CD, no reptile species of conservation concerns are known to occur in the vicinity of the proposed development site. The study area supports limited suitable habitat for any arboreal species but provided suitable habitat for terrestrial reptile species such as Ground Agama, Yellow throated Plated Lizard, Montane Speckled or Striped Skink as well as snake species (Rinkhals, Mole Snake, and Black-headed Centipede Eater. Termite mounds were present on site. Old termite mounds offer important refuges especially during veld fires as well as cold winter months for numerous frog, lizard, snake and smaller mammal species. Large number of species of mammal, birds, reptiles and amphibians feed on the emerging alates (winged termites). No termite mounds were destroyed during the brief field survey. All overturned rock material was carefully replaced in its original position. Only one reptile species, the Distant's Ground Agama (*Agama aculeata* subsp *distanti*) was recorded on the proposed development site.

15.4.5 Impact Assessment

Refer to **Section 16.8.2** for the results from the impact assessment from this study.

15.4.6 Conclusions and Recommendations

Generally, the negative impacts to the receiving environment resulting from the study area are probably of an acceptable significance and magnitude, if appropriate mitigations measures are implemented and construction is implemented in a sensitive manner. The proposed development will cause disruption during the construction phase, but as long as mitigation measures are implemented, these disruptions should have minimal lasting effect on the ecosystems of the study area. It is the opinion of the ecologist, that the proposed development be considered favourably, provided that the sensitivity map be considered during the planning and construction phases and also mitigations measures are implemented and adhered to and this will aid in the conservation of ecology within the study area.

15.5 Heritage Impact Assessment

A summary of the Heritage Impact Assessment (PGS, 2019), as contained in **Appendix E3**, follows. Refer to **Section 16.13** for an assessment of the associated impacts.

15.5.1 Details of the Specialist

The details of the specialist that undertook the above-mentioned specialist study, follow.

Organisation:	PGS Heritage
Name:	Wouter Fourie
Qualifications:	BA (Hons) Archaeology and Geography

Affiliation (if applicable):

- Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member
- Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP)

15.5.2 Objectives of the Study

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed development area and as a result help determine if the proposed layout is viable. The Heritage Impact Assessment (HIA) aims to inform the EIA in the development of a comprehensive EMP to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop the heritage resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

15.5.3 Methodology

The HIA process consists of three steps:

- ❖ **Step I** – Literature Review - The background information to the field survey relies greatly on the Heritage Background Research.
- ❖ **Step II** – Physical Survey - A physical survey was conducted predominantly by vehicle along the proposed Newlands pipeline proposed area by a qualified archaeologist, which aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.
- ❖ **Step III** – The final step involved the recording and documentation of relevant archaeological resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

15.5.4 Key Findings

15.5.4.1 Desktop Findings

Refer to **Section 14.15** for a summary of the archival and desktop research findings.

15.5.4.2 Field Work Findings

Due to the nature of cultural remains, with the majority of artefacts occurring below the surface, a controlled-exclusive surface survey was conducted over a period of 1 day, on foot, by an archaeologist and field assistant from PGS. The fieldwork was conducted on 30 August 2016. A total of nine heritage sites were identified within and just outside the proposed development area (refer to **Figure 43**). Seven related Iron Age sites (LIM 003 to LIM 009).

An overview of the heritage resources found on the proposed site, is provided below:

LIM 007

Another large ash midden was identified at this location (**Figure 44**). It also consists of a mound of ash mixed with soil and it also contains numerous potsherds, discarded animal bones and other archaeological material.

The mound measures approximately 15m, but a part of this site has been damaged during earth moving activities for the construction of the N1 by-pass right next to it. The full extent of this site could not be determined.

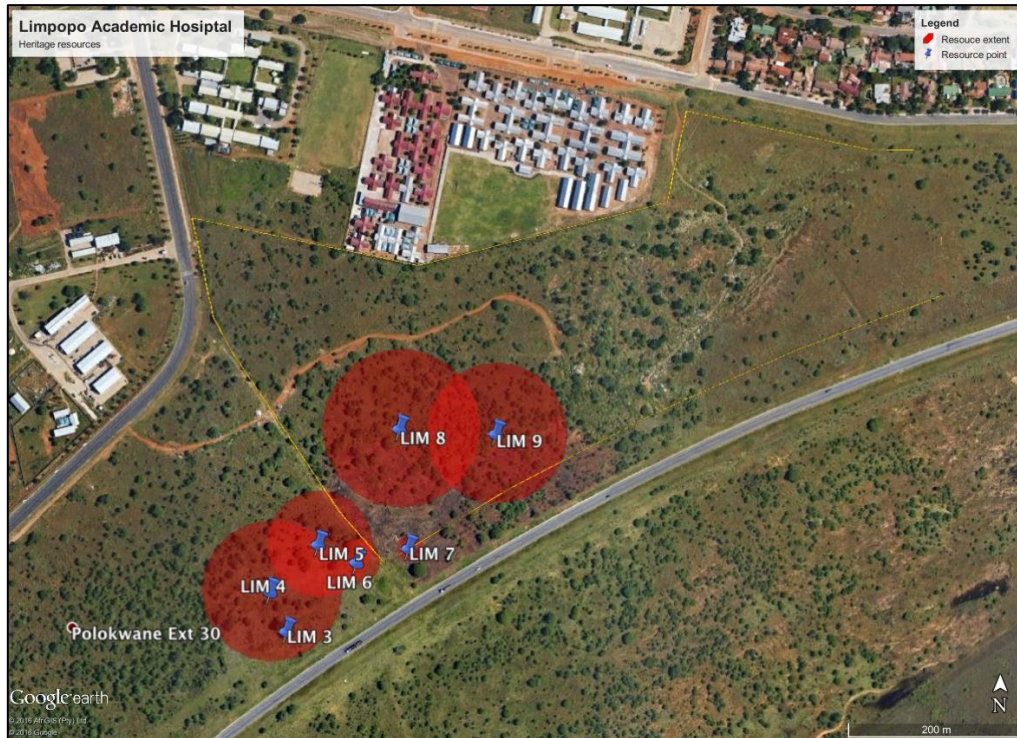


Figure 43: Heritage resources in relation to the study area (PGS, 2019)

This site is in close proximity of the stone walled complexes and enclosures identified at sites LIM 008 and LIM 009. The people who resided at the identified stone walled complexes most probably used this area to dump their domestic rubbish.



Figure 44: View of LIM 007

The site is deemed to be of **High/Medium Significance** and is rated as Generally Protected A (GP.A). Mitigation measures and permits are therefore required before they may be affected or moved/destroyed.

LIM 008

Another stone walled complex was identified at this location. This complex is similar to the one identified at site LIM 004. It also consists of several enclosures and sections of low, packed stone walls (**Figure 45**). The walls are also disturbed in several places, but they form part of a larger, extensive settlement which extends further to the south and to the north. This identified section of stone walled enclosures, extend from site LIM 007 and measure approximately 90m in diameter. The walls consist of low, double or single line packed rocks, which are damaged to some extent in some areas. The stone walls are also overgrown with grass and other vegetation which makes the identification of the size, shape and purpose of the stone walls difficult. Several potsherds were also identified from within the stone walled enclosures.



Figure 45: View of LIM 008

The identified site is deemed to be of **High/Medium Significance** and is rated as Generally Protected A (GP.A). Mitigation measures and permits are therefore required before the site may be affected, moved or destroyed.

LIM 009

Another stone walled complex was identified at this location (**Figure 46**). This complex is similar to the one identified at site LIM 004.

It also consists of several enclosures and sections of low, packed stone walls. The walls are also disturbed in several places, but they form part of a larger, extensive settlement which extends further to the south and to the north. This identified section of stone walled enclosures measures approximately 80m in diameter. The walls consist of low, double or single line packed rocks which are damaged to some extent in some areas. The stone walls are also overgrown with grass and other vegetation which makes the identification of the size, shape

and purpose of the stone walls difficult. Several potsherds were identified within the stone walled enclosures.



Figure 46: View of LIM 009

The identified site LIM 005 is deemed to be of **High/Medium Significance** and is rated as Generally Protected A (GP.A). Mitigation measures and permits are therefore required before they may be affected or moved/destroyed.

15.5.4.3 Palaeontology

It was found that the palaeontological sensitivity for the study area was low and/or insignificant and that no palaeontological studies are required.

15.5.5 Impact Assessment

Refer to **Section 16.13.2** for the results from the impact assessment from this study.

15.5.6 Conclusions and Recommendations

The identified heritage sites are rated of having **High/Medium Significance** as well as being Generally Protected A (GP.A). Mitigation measures and permits are therefore required before they may be affected, moved or destroyed, thus the sites identified are considered as “no go” areas until further mitigation is implemented.

15.6 Agricultural Impact Assessment

A summary of the Agricultural Impact Assessment (Terra Soil Science, 2019), as contained in **Appendix E1**, follows. Refer to **Section 16.10** for an assessment of the associated impacts.

15.6.1 Details of the Specialist

The details of the specialist that undertook the above-mentioned specialist study, follow.

Organisation:	Terra Soil Science
Name:	J. H. van der Waals

Qualifications:	Ph.D. Soil Science
Affiliation (if applicable):	<ul style="list-style-type: none"> • Member of the Soil Science Society of South Africa (SSSSA); • Accredited member of the South Africa Soil Surveyors Organisation (SASSO); and • Registered with the South African Council for Natural Scientific Professions (Reg No: 400106/08).

15.6.2 Objectives of the Study

This report was generated following a dedicated satellite image, topographical and land type data interpretation exercise. Due to extensive experience in the field as well as in the general area the pronouncements in this report are considered to be accurate and representative of the specific site.

15.6.3 Key Findings

15.6.3.1 Agricultural Potential

The soils are suitable for dryland and irrigated crop production activities and are therefore considered to be of moderate to high agricultural potential. However, the urban nature of the surrounding developments as well as the fact that the site is enclosed by developments and national roads, and therefore limited to 38 ha in size, yields that it does not constitute a viable agricultural entity. This observation is underpinned by the fact that land users on the site would have to pay municipal rates and taxes.

15.6.3.2 Soil Potential

The current land is open veld that could be used for extensive cattle grazing. This is not a safe land use in the light of the risks cattle movement pose to the vehicles travelling the N1 highway on the southern boundary. The soils on the site can be used for crop production purposes with this assumption being dependent on a physical soil survey. This use is not advised due to the limitations posed by dust generation to vehicles and planes, farming vehicle movement near the N1 and urban developments, and access restrictions to the site by agricultural land users.

15.6.3.3 Cost-Benefit Analysis

With urban and infrastructure developments the benefit and value of the developments will invariably exceed the agricultural value. As the land is not of exceptional agricultural potential the result of such an analysis will be skewed towards development. This is especially relevant within the urban fringe and the current surrounding and intensifying urban developments.

15.6.3.4 Existing Structures and Infrastructure

The site itself is not characterised by any buildings or developments but, as has been shown in this report, the surrounding areas are characterised by distinct and intensive urban development and expansion.

15.6.3.5 Surrounding Developments

Refer to point 13.6.4.4. It is not possible to expand the site to incorporate surrounding land as it has been developed on all sides through urban and transport infrastructure.

15.6.3.6 Current Status of Land

The current status of the land is open veld with no obvious land use. The land is characterised by urban developments on all sides and as such constitutes a hemmed-in piece of land without the possibility of expansion within the immediate vicinity.

15.6.3.7 Possible Land Use Options for the Site

Within the context of the surrounding urban developments and the mounting urbanisation pressures experience in Polokwane the possibility of agricultural activities on the site appear to be very limited. In this regard, due to the isolated nature (from other agricultural land areas) of the site the most suitable land use is considered to be incorporation with the existing urban character of the surrounding areas.

15.6.4 Impact Assessment

Refer to **Section 16.10.2** for the results from the impact assessment from this study.

15.6.5 Conclusions and Recommendations

1. The site lies in the Ae225 land type and as such consists predominantly of soils of the Hutton form. These soils are variable in depth.
2. The rainfall of the area is an average of 500 mm per year and this constitutes the lower boundary of what is considered suitable for dryland crop production.
3. The site is surrounded by urban infrastructure developments and the land can therefore not be incorporated with similar land in the vicinity to enlarge that land unit.
4. Agricultural activities on the site will be limited due to 1) the small geographical extent; 2) the risks posed by vehicle and animal ingress onto the N1 highway; 3) the potential increased risk of regular dust generation with blowing of this dust onto the N1 and nearby airport runways; and 4) the limitations placed on agricultural productivity on urban related rates and taxes.

It is recommended that the site be incorporated into the urban development zone in order to relieve pressure on areas lying further out of the urban fringe in terms of urban expansion pressures.

15.7 Socio-Economic Impact Assessment

A summary of the Socio-Economic Impact Assessment (Nemai Consulting, 2019a), as contained in **Appendix E4**, follows. Refer to **Section 16.9** for an assessment of the associated impacts.

15.7.1 Details of the Specialist

The details of the specialist that undertook the above-mentioned specialist study, follow.

Organisation:	Nemai Consulting
Name:	Ciaran Chidley
Qualifications:	BA (Economics); BSc Eng (Civil); MBA
Affiliation (if applicable):	N/A

15.7.2 Objectives of the Study

The terms of reference for the project is indicated below:

- ❖ Determine the specific local socio-economic, land utilisation and acquisition implications of the project.
- ❖ Collect baseline data on the current socio-economic environment.
- ❖ Assess socio-economic impacts (positive and negative) of the project,
- ❖ Undertake a thorough review of the following with the purpose of identifying landowner issues:
 - Minutes of public meetings and individual meetings; and
 - Comments and Response Report.
- ❖ Suggest suitable mitigation measures to address the identified impacts.
- ❖ Make recommendations on preferred options from a socio-economic perspective.

15.7.3 Methodology

Socio-Economic Impact Assessment (SEIA) is an interactive process by nature which relies on both desktop research as well as input from the community. SEIA assist the community to be part of the environmental decision-making process and empower communities to participate in decisions that will affect their livelihoods (DEAT, 2006). The Australian Government Department of the Environment and Heritage (2005:5) states that Socio-economic Impact Assessment is a useful tool to help understand the potential range of impacts of a proposed change, and the likely responses of those impacted on if the change occurs.

An SEIA is used during the EIA process to identify and evaluate potential social, economic or cultural impacts of a proposed development. The SEIA recognises the important relationship between the economic, social and biophysical environment. The SEIA will look at minimising adverse impacts of the proposed development while aiming to maximise the beneficial impacts. The SEIA sets out the socio-economic baseline, predicts impacts and makes recommendations for mitigation.

15.7.4 Key Findings

Refer to **Section 14.11** where the findings of the study on the situational analysis have been incorporated in order to update the status quo of the socio-economic environment.

15.7.5 Impact Assessment

Refer to **Section 16.9.2** for the results from the impact assessment from this study.

15.7.6 Conclusions and Recommendations

The study has assessed the socio-economic impacts of the proposed project. As expected of any construction project, there were several positive and negative socio-economic impacts identified.

Construction of the proposed hospital will positively impact health of citizens in Polokwane and surrounding areas in that it improves access to healthcare. It will help to enhance access to diagnostic services for vulnerable groups; improve capacity to provide specialized services, conduct monitoring services and create the opportunity to provide a better balance of specialist care in the province. Overall, there will be an improvement to public health in the receiving environment.

There is a need to create teaching capacity within the province to address medical, and health services skills shortages, as such, the proposed new hospital and research centre, geared towards specific requirements of a rural province, and the hospital would further provide the opportunity to create an environment that would attract key teaching, central and scarce professional staff.

The proposed project will create short term construction benefits to the receiving communities in the form of employment, skills and small business development.

The socio-economic impact assessment has identified the need for relocation of three or four homeless dwellers occupying the proposed site. It is recommended that the inhabitants should be relocated with due regard to the law and their particular circumstances.

If the relocation of identified unlawful inhabitants on site is successfully carried out, the remaining identified negative impacts can be successfully mitigated through the use of recommendations provided in this report and the positive impacts will bring economic and social benefits to the area such as operational benefits of access to health care. These impacts will occur mainly during the construction phase and are thus a relatively short-term impact.

The positive socio-economic impacts of this project are assessed to far outweigh the negative impacts. The negative impacts are short-term and local in extent and the positive impacts of the hospital are long-term and regional in extent. As such, the proposed Limpopo Central Hospital is sustainable from a socio-economic perspective.

16 IMPACT ASSESSMENT

16.1 Overview

This section focuses on the pertinent environmental impacts that could potentially be caused by the proposed Limpopo Central Hospital during the pre-construction, construction and operational phases of the project.

Note that an 'impact' refers to the change to the environment resulting from an environmental aspect (or activity), whether desirable or undesirable. An impact may be the direct or indirect consequence of an activity.

Impacts were identified as follows:

- ❖ An appraisal of the project activities and components;
- ❖ Impacts associated with listed activities contained in GN No. R. 983, R. 984 and R. 985 of 4 December 2014, as amended, for which authorisation has been applied for;
- ❖ An assessment of the receiving biophysical, social, economic and built environment;
- ❖ Findings from specialist studies;
- ❖ Issues highlighted by environmental authorities; and
- ❖ Comments received during public participation from IAPs.

16.1.1 Impacts Associated with Listed Activities

As mentioned, the project requires authorisation for certain activities listed in the 2014 EIA Regulations (as amended), which serve as triggers for the environmental assessment process. The significant potential impacts associated with the listed activities are broadly stated in **Table 22**.

Table 22: Potential Impacts associated with the triggered listed activities

Listed Activities	Significant Potential Impacts
<p><i>GN No R.983 – Activity No. 15:</i> <i>The clearance of an area of 20 hectares or more of indigenous vegetation</i></p>	<ul style="list-style-type: none"> • Clearance of a large area of indigenous vegetation associated with the construction footprint of the hospital and associated infrastructure, laydown areas and general site establishment; • Potential loss of sensitive environmental features (e.g. heritage resources, sensitive fauna and flora species); • Visual impacts; • Traffic disruptions during construction; • Dust and noise pollution during construction; • Socio-economic impacts associated with construction activities; and • Waste generation during construction.
<p><i>GN No. R.985 – Activity 10 (e)(i):</i> <i>The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such</i></p>	<ul style="list-style-type: none"> • Pollution of the bio-physical environment and risks posed to human health through poor practices associated with onsite storage of dangerous goods during the construction and operational phase.

Listed Activities	Significant Potential Impacts
<p>storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.</p> <p>e. Limpopo</p> <p>(i) all areas</p>	

Refer to **Table 29** for a summary of all the potential significant environmental impacts associated with the proposed project.

16.1.2 Environmental Activities

In order to understand the impacts related to the project it is necessary to unpack the activities associated with the project life-cycle, as done in the sub-sections to follow.

16.1.2.1 Project Phase: Pre-construction

The main project activities as well as high-level environmental activities undertaken in the pre-construction phase are listed in **Table 23**.

Table 23: Activities associated with the Pre-construction Phase

PRE-CONSTRUCTION PHASE	
Project Activities	
1.	Obtain Environmental Authorisation, and other relevant permits
2.	Applicant to appoint Environmental Control Officer (ECO)
3.	Negotiations and agreements with the individual affected landowners and stakeholders
4.	Detailed engineering design
5.	Detailed geotechnical design
6.	Site survey
7.	Procurement of contractors
8.	Mark construction servitude
9.	Registration of the servitude
10.	Pre-construction photographic records
11.	Development and approval of method statements
12.	Development and approval of construction plans
13.	Development of employment strategy
14.	Construction site planning, access and layout
Environmental Activities	
1.	Undertake a pre-construction survey of the project footprint by the relevant environmental specialists to identify sensitive environmental features
2.	Develop Search, Rescue and Relocation Plan
3.	Demarcation of buffers around sensitive areas
4.	Diligent compliance monitoring of the EA, EMPr and other relevant environmental legislation

PRE-CONSTRUCTION PHASE

5. Barricading and installing barriers around buffer areas identified in specialist studies
6. Ongoing consultation with landowners and affected parties

16.1.2.2 Project Phase: Construction

The main project activities as well as high-level environmental activities undertaken in the construction phase are listed in **Table 24**.

Table 24: Activities associated with the Construction Phase

CONSTRUCTION PHASE	
Project Activities	
1. Site establishment (including site camp and labour camp)	
2. Fencing of the construction area	
3. Pegging of central line and overall footprint	
4. Site clearing	
5. Delivery of construction material	
6. Transportation of equipment, materials and personnel	
7. Storage and handling of material	
8. Cut and cover activities	
9. Stockpiling (sand, crushed stone, aggregate, etc.)	
10. Stormwater control mechanisms	
11. Management of topsoil and spoil	
12. Waste and wastewater management	
13. Traffic control measures	
14. Bulk earthworks	
15. Site security	
16. Electrical supply	
17. Construction of the proposed infrastructure	
18. Road surface finishes	
19. Concrete works	
20. Landscaping	
Environmental Activities	
1. Reinstatement and rehabilitation of construction domain	
2. Control of invasive plant species	
3. Diligent compliance monitoring of the EA, EMPr and other relevant environmental legislation	
4. Conduct environmental awareness training	
5. Implement EMPr	
6. Ongoing consultation with landowners and affected parties	

16.1.2.3 Project Phase: Operation

The main project activities as well as high-level environmental activities undertaken in the operational phase are listed in **Table 25**.

Table 25: Activities associated with the Operational Phase

OPERATIONAL PHASE	
Project Activities	
1. Operation of Limpopo Central Hospital	
Environmental Activities	
1. Ongoing consultation with IAPs	
2. Erosion monitoring programme	
3. Management of sensitive areas or buffered areas	
4. Management of waste	
5. Stormwater management	
6. Pollution control measures	
7. Control of invasive plant species	

16.1.3 Environmental Aspects

Environmental aspects are regarded as those components of an organisation's activities, products and services that are likely to interact with the environment and cause an impact. **Table 26, 27 and 28** provide the environmental aspects that have been identified for the proposed project, which are linked to the project activities. Note that only high-level aspects are provided.

Table 26: Environmental aspects associated with the Pre-Construction Phase

ENVIRONMENTAL ASPECTS	
Pre-construction Phase	
1. Inadequate consultation with landowners	
2. Poor construction site planning and layout	
3. Inadequate environmental and compliance monitoring	
4. Inaccurate pre-construction survey (including search and rescue)	
5. Absence of relevant permits (e.g. for protected plants, trees and heritage resources)	
6. Lack of barricading of sensitive environmental features	

Table 27: Environmental aspects associated with the Construction Phase

ENVIRONMENTAL ASPECTS	
Construction Phase	
1. Inadequate consultation with landowners	
2. Inadequate environmental and compliance monitoring	
3. Lack of environmental awareness creation	

ENVIRONMENTAL ASPECTS	
Construction Phase	
4. Indiscriminate site clearing	
5. Poor site establishment	
6. Poor management of access and use of access roads	
7. Poor transportation practices	
8. Poor traffic management	
9. Disturbance of topsoil	
10. Disruptions to existing services	
11. Inadequate storage and handling of material	
12. Inadequate storage and handling of hazardous material	
13. Erosion	
14. Poor maintenance of equipment and plant	
15. Poor management of labour force	
16. Pollution from ablution facilities	
17. Inadequate management of construction camp	
18. Absence of ablution facilities	
19. Poor waste management practices – hazardous and general (solid and liquid)	
20. Poor management of pollution generation potential	
21. Poor management of water	
22. Damage to significant fauna and flora (if encountered)	
23. Environmental damage of sensitive areas	
24. Disruption of archaeological and culturally significant features (if encountered)	
25. Dust and emissions due to construction activities	
26. Noise nuisance due to construction activities	
27. Poor reinstatement and rehabilitation	

Table 28: Environmental aspects associated with the Operational Phase

ENVIRONMENTAL ASPECTS	
Operational Phase	
1. Inadequate consultation with landowners	
2. Inadequate environmental and compliance monitoring	
3. Inadequate management of waste	

16.1.4 Potentially Significant Environmental Issues

Note that it is not the intention of the impact assessment to evaluate all potential environmental impacts associated by the project's environmental aspects, but rather to focus on the potentially **significant** direct and indirect impacts identified during the Scoping phase and any additional issues uncovered during the EIA stage.

The potential significant environmental impacts associated with the project, as listed in **Table 29**, were identified through an appraisal of the following:

- ❖ Project-related components and associated infrastructure (refer to **Section 7.1**);
- ❖ Activities associated with the project life-cycle (pre-construction, construction, and operation);
- ❖ Nature and profile of the receiving environment and potential sensitive environmental features and attributes (refer to **Section 14**);
- ❖ Findings from specialist studies (refer to **Section 15**);
- ❖ Understanding of direct and indirect effects of the project as a whole (refer to **Section 16**);
- ❖ Input received during public participation from authorities and IAPs; and
- ❖ Legal and policy context (refer to **Section 8**).

Table 29: Potentially Significant Environmental Impacts

Environmental Feature	Potential Issues / Impacts during the Construction Phase	Potential Issues / Impacts during the Operational Phase
Land Use	<ul style="list-style-type: none"> • Permanent loss of land during site clearance. 	<ul style="list-style-type: none"> • Permanent loss of land.
Climate	<ul style="list-style-type: none"> • Emissions of greenhouse gases during the construction phase. 	<ul style="list-style-type: none"> • Emissions of greenhouse gases during the operational phase when emergency generators are in use.
Geology and Soil	<ul style="list-style-type: none"> • Unsuitable geological conditions – risks to structural integrity of infrastructure. • Soil erosion (e.g. poor management of stormwater); • Loss of topsoil; • Soil contamination through poor construction practices and inadequate management of dangerous goods (e.g. fuel); and • Blasting related impacts (if required). 	<ul style="list-style-type: none"> • Soil erosion (e.g. poor management of stormwater). • Soil contamination (e.g. poor management of storage and handling of dangerous goods).
Geohydrology	<ul style="list-style-type: none"> • Potential disturbance of the aquifer from blasting (if required). • Potential contamination of groundwater from construction activities and inadequate management of dangerous goods (e.g. fuel). 	<ul style="list-style-type: none"> • Potential pollution of groundwater from poor management of storage and handling of dangerous goods.
Surface Water	<ul style="list-style-type: none"> • Surface water pollution due to inadequate management of dangerous goods and poor construction practices. • Poor stormwater management on site resulting in surface water pollution (erosion and sedimentation) • Poor management of waste generated on site resulting in polluted surface water. 	<ul style="list-style-type: none"> • Poor stormwater management on site resulting in surface water pollution (erosion and sedimentation) • Surface water pollution from the poor management of storage and handling of dangerous goods.
Terrestrial Ecology	<ul style="list-style-type: none"> • Impacts to sensitive terrestrial ecological features; • Potential loss of significant flora and fauna species; 	<ul style="list-style-type: none"> • Proliferation of exotic vegetation.

Environmental Feature	Potential Issues / Impacts during the Construction Phase	Potential Issues / Impacts during the Operational Phase
	<ul style="list-style-type: none"> • Damage / clearance of habitat of conservation importance in construction domain; • Proliferation of exotic vegetation 	
Historical and Cultural Features	<ul style="list-style-type: none"> • Heritage and cultural resources could be destroyed or damaged through construction activities. 	-
Air Quality	<ul style="list-style-type: none"> • Excessive dust levels during construction activities (i.e. site clearing, bulk earthworks, use of construction vehicles on site) 	-
Noise	<ul style="list-style-type: none"> • Localised increase in noise levels during construction activities; • Noise from blasting activities (if required) 	<ul style="list-style-type: none"> • Localised increase in noise from use of generators; • Occasional increase in noise from use of ambulance and helicopter at hospital. • Impacts from noise from adjacent N1 road on hospital operations.
Waste Management	<ul style="list-style-type: none"> • Construction activities will result in the generation of different waste types (solid waste, domestic, general, hazardous and liquid waste). If poorly managed, it may lead to surface and groundwater, air and soil pollution on site. 	<ul style="list-style-type: none"> • Possible pollution from poor management and storage of medical waste, HCRW, general, hazardous and liquid waste.
Traffic	<ul style="list-style-type: none"> • Increase in traffic on the local road networks during construction phase. • Risks to road users. 	<ul style="list-style-type: none"> • Increase in traffic on the local road networks during operational activities of hospital.
Aesthetics	<ul style="list-style-type: none"> • Visual quality and sense of place to be adversely affected by construction activities (mainly Edupark, Northern Academy Secondary School, and residential properties adjacent to construction domain • Inadequate reinstatement and rehabilitation of construction footprint. 	<ul style="list-style-type: none"> • High visibility of permanent infrastructure; • Loss of “sense of place” to neighbouring properties due to development of vacant land; • Light pollution caused by hospital.
Agriculture	<ul style="list-style-type: none"> • Permanent loss of moderate arable land. • Permanent alteration of soils on site. 	<ul style="list-style-type: none"> • Permanent loss of moderate arable land.
Health and Safety	<ul style="list-style-type: none"> • Hazards/accidents related to construction work; • Poor storage and handling of dangerous goods; and • Safety and security. 	<ul style="list-style-type: none"> • Poor storage and handling of dangerous goods.
Socio-Economic Environment	<ul style="list-style-type: none"> • Loss of land within construction domain; • Nuisance from dust and noise; • Influx of people seeking employment • Safety and security; • Use of local road network; • Increase in employment opportunities; • Skills development and transfer; • Impacts on local SMME's. 	<ul style="list-style-type: none"> • Improved access and provision of public healthcare; • Increase in employment; • Skills development.

Cumulative impacts are discussed in **Section 16.20**

16.1.5 Impact Assessment Methodology

The impacts and the proposed management thereof are first discussed on a qualitative level and thereafter quantitatively assessed by evaluating the nature, extent, magnitude, duration, probability and ultimately the significance of the impacts (refer to methodology provided in **Table 30**).

Where applicable, the impact assessments and significance ratings provided by the respective specialists are included. The assessment considers impacts before and after mitigation, where in the latter instance the residual impact following the application of the mitigation measures is evaluated.

Table 30: Quantitative Impact Assessment Methodology

<p><u>Nature (/Status)</u></p> <p>The project could have a positive, negative or neutral impact on the environment.</p>
<p><u>Extent</u></p> <ul style="list-style-type: none"> • Local - extend to the site and its immediate surroundings. • Regional - impact on the region but within the province. • National - impact on an interprovincial scale. • International - impact outside of South Africa.
<p><u>Magnitude</u></p> <p>Degree to which impact may cause irreplaceable loss of resources.</p> <ul style="list-style-type: none"> • Low - natural and social functions and processes are not affected or minimally affected. • Medium - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way. • High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.
<p><u>Duration</u></p> <ul style="list-style-type: none"> • Short term - 0-5 years. • Medium term - 5-11 years. • Long term - impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention. • Permanent - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
<p><u>Probability</u></p> <ul style="list-style-type: none"> • Almost certain - the event is expected to occur in most circumstances. • Likely - the event will probably occur in most circumstances. • Moderate - the event should occur at some time. • Unlikely - the event could occur at some time. • Rare/Remote - the event may occur only in exceptional circumstances.
<p><u>Significance</u></p> <p>Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-</p>

- 0 – Impact will not affect the environment. No mitigation necessary.
- 1 – No impact after mitigation.
- 2 – Residual impact after mitigation.
- 3 – Impact cannot be mitigated.

In the case of the specialist studies, some of the impact assessment methodologies deviated from the approach shown in **Table 30**. However, the quantitative basis for these specialist evaluations of the impacts to specific environmental features still satisfied the intention of the EIA.

16.1.6 Impact Mitigation

Impacts are to be managed by assigning suitable mitigation measures. According to DEAT (2006), the objectives of mitigation are to:

- ❖ Find more environmentally sound ways of executing an activity;
- ❖ Enhance the environmental benefits of a proposed activity;
- ❖ Avoid, minimise or remedy negative impacts; and
- ❖ Ensure that residual negative impacts are within acceptable levels.

Mitigation should strive to abide by the following hierarchy – (1) prevent; (2) reduce; (3) rehabilitate (or remediate); and/or (4) compensate for the environmental impacts.

The proposed mitigation of the impacts associated with the project includes specific measures identified by the technical team (including engineering solutions) and environmental specialists, stipulations of environmental authorities and environmental best practices.

Note that the mitigation measures in the subsequent sections are not intended to be exhaustive, but rather focus on the potentially significant impacts identified.

The EMPr, contained in **Appendix H**, provides a comprehensive list of mitigation measures for specific elements of the project, which extends beyond the impacts evaluated in the body of the EIA Report.

16.2 Land Use

16.2.1 Potential Impacts

The dominant land use and land cover in the areas earmarked for the project infrastructure is presented in **Section 14.2**. The proposed site falls mainly within land cover classified as open bush/grassland, which will be cleared during the construction phase and result in the permanent loss of the current land cover within the project footprint.

Refer to the Socio-Economic Impact Assessment (see **Section 16.9**) and Agricultural Impact Assessment (see **Section 16.10**) for the impact assessment of land use.

16.3 Climate

16.3.1 Potential Impacts

The EMPr includes measures to control and minimize greenhouse gas (GHG) emissions by optimizing the utilisation of construction resources.

16.3.2 Impact Assessment

Environmental Feature	Climate					
Project life-cycle	Construction phase					
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures					
GHG emissions	<ul style="list-style-type: none"> Materials with a high recycled content should be used where possible and the re-use of site materials should be considered. Suitable training should be provided to operators to ensure that they maximise the efficiency of the plant and idling is reduced. In terms of transportation of workers and staff, collective transportation arrangements should be made to reduce individual car journeys. All vehicles used during the project should be properly maintained and in good working order. 					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	unknown	short-term	almost certain	2
After Mitigation	-	local	unknown	short-term	almost certain	2

16.4 Geology and Soils

16.4.1 Potential Impacts

- ❖ The following impacts could be expected during the construction phase:
 - Unsuitable geological conditions –risks to structural integrity of infrastructure.
 - Soil erosion (e.g. poor management of stormwater as a result of vegetation clearance).
 - Vehicles travelling on the construction roads, as well as materials stored in the laydown area will cause compaction of soil, which decreases soil fertility.
 - Loss of topsoil.
 - Soil contamination through poor construction practices (such as wastewater) and inadequate management of dangerous goods (such as fuel spills or leaks).
 - Blasting related impacts (if required depending on geotechnical conditions).
- ❖ The following impacts could be expected during the operational phase:
 - Soil erosion (e.g. poor management of stormwater).

- Soil contamination (e.g. poor management of storage and handling of dangerous goods, such as fuel spills and leaks).

Specific mitigation measures are contained in the EMPr, where the primary objective is the effective and safe management of materials on site, in order to minimise the impact of these materials on the biophysical environment. The same objective applies to the correct management and handling of dangerous goods/hazardous substances (e.g. fuel).

16.4.2 Impact Assessment

Consider findings from geotechnical investigations during project design phase and incorporate mitigation measures (as relevant). According to the geotechnical study (AGES, 2010a), no adverse geological conditions are expected that would prohibit the construction of the proposed Limpopo Central Hospital.

Also refer to **Section 16.10.2** for the Agricultural Impact Assessment (see **Appendix E1**) impact assessment for soil resources and agricultural potential.

Environmental Feature	Soils
Project life-cycle	Construction phases
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
Soil erosion	<ul style="list-style-type: none"> • Stabilisation of cleared areas to prevent and control erosion. The method chosen (e.g. watering, planting, retaining structures, commercial anti-erosion compounds) will be selected according to the site-specific conditions. Drainage management should also be implemented to ensure the minimization of potential erosion. • Acceptable reinstatement and rehabilitation of disturbed areas to prevent erosion. • Monitoring to be conducted to detect erosion. • An ecologically-sound stormwater management plan must be implemented during construction and appropriate water diversion systems put in place.
Loss of topsoil	<ul style="list-style-type: none"> • Remove, stockpile and preserve topsoil for re-use during rehabilitation. • Topsoil should be temporarily stockpiled, separately from subsoil and rocky material, when areas are cleared. If mixed with sub-soil the usefulness of the topsoil for rehabilitation of the site will be lost. • Stockpiled topsoil should not be compacted and should be replaced as the final soil layer. No vehicles are allowed access onto the stockpiles after they have been placed. • Stockpiled soil shall not exceed 1.5m in height. Topsoil stripped must be stockpiled separately and clearly identified as such. Topsoil obtained from sites with different soil types must not be mixed. • After excavation, all soils must be replaced in the same order as they were removed. • Soil should be exposed for the minimum time possible once cleared of invasive vegetation, that is the timing of clearing and grubbing should be coordinated as much as possible

	<p>to avoid prolonged exposure of soils to wind and water erosion. Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds.</p> <ul style="list-style-type: none"> • Soil stockpiles, and topsoil stockpiles in particular, must be kept free of invasive alien vegetation growth.
Contamination of soil	<ul style="list-style-type: none"> • All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment and containment trays placed underneath immobile equipment. • Soil contaminated with oil must be removed and disposed of at a permitted landfill site or the soil can be regenerated using bio-remediation methods. • Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and microorganisms in the soil. • The EMPr includes measures for the management of storage and handling of hazardous substances to prevent soil pollution. • All storage tanks containing hazardous substances must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous substance.
Blasting (if required)	<ul style="list-style-type: none"> • Prior to commencing with blasting activities, the blasting Contractor shall submit a Method Statement which shall comply with the Explosives Regulations (2003) and all relevant SANS standards and health and safety standards for mitigating blasting. • The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures. • Blasting operations shall be controlled to ensure sound pressure levels are kept below the generally accepted 'no damage' level of 140 decibels. • Communicate blasting and after-hours construction work to all adjacent landowners.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium	short-term	almost certain	2
After Mitigation	-	local	low	short-term	almost certain	1

Environmental Feature	Soils
Project life-cycle	Operational phases
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
Soil erosion	<ul style="list-style-type: none"> • A stormwater management plan must be in place for the hospital. • Ensure stormwater infrastructure is managed and maintained in line with the stormwater management plan.
Contamination of soil	<ul style="list-style-type: none"> • All equipment must be inspected regularly for oil or fuel leaks before it is operated. Leakages must be repaired.

	<ul style="list-style-type: none"> The EMPr includes measures for the management of storage and handling of hazardous substances to prevent soil pollution. All storage tanks containing hazardous substances must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous substance. 					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium	short-term	almost certain	2
After Mitigation	-	local	low	short-term	almost certain	1

16.5 Geohydrology

16.5.1 Potential Impacts

Impacts to groundwater resources during the construction phase could include:

- ❖ Potential disturbance of the aquifer from blasting (if required).
- ❖ Potential contamination of groundwater during the construction stage from spillages or poor storage of oils, fuels etc.

Impacts to groundwater resources during the operational phase could include:

- ❖ Potential pollution of groundwater from poor management of storage and handling of dangerous goods.

16.5.2 Impact Assessment

Consider findings from geotechnical investigations during project design phase and incorporate mitigation measures (as relevant).

Environmental Feature	Geohydrology
Project life-cycle	Construction phase
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
Potential disturbance to aquifer from blasting (if required).	<ul style="list-style-type: none"> Suitable protection of aquifer during blasting.
Possible contamination of groundwater from poor construction practices.	<ul style="list-style-type: none"> All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material. Suitable protection of groundwater during excavations. Implement mitigation measures suggested as part of the geotechnical investigations for managing groundwater. Any contaminated water (containing oils, diesel, or other hydrocarbons, or chemical substances) must be suitably stored to limit the risk of environmental contamination until it can be suitably treated and disposed of through a

	registered service provider at a registered waste management facility. <ul style="list-style-type: none"> Storage and use of hazardous substances must be undertaken in such a way as to minimise the potential for environmental contamination. 					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	low	short-term	unlikely	2
After Mitigation	-	local	low	short-term	unlikely	1

Environmental Feature	Geohydrology					
Project life-cycle	Operational phase					
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures					
Potential pollution of groundwater from poor management of storage and handling of dangerous goods	<ul style="list-style-type: none"> All storage tanks containing hazardous materials must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous material. Storage and use of hazardous substances must be undertaken in such a way as to minimise the potential for environmental contamination. Proper emergency response procedure to be in place and communicated to designated persons for dealing with spills and leaks. The EMPr includes measures for the management of storage and handling of hazardous substances to prevent pollution of groundwater. 					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	low	short-term	unlikely	2
After Mitigation	-	local	low	short-term	unlikely	1

16.6 Topography

16.6.1 Potential Impacts

Erosion can occur where construction activities take place in terrain that is characterised by steep gradients, in the absence of suitable stormwater management and stabilisation of the cut and fill areas. The EMPr makes provision for the management of erosion, stormwater management, reinstatement and rehabilitation.

16.6.2 Impact Assessment

Refer to **Section 16.4.2** for the impact assessment and mitigation measures provided for soil erosion.

16.7 Surface Water

16.7.1 Potential Impacts

During the construction phase, potential contamination of surface water could occur through improper practices (e.g. poor management of waste water and disposal of solid waste) and stormwater management.

The risks identified as part of the Riparian Habitat and Wetland Delineation Impact Assessment (The Biodiversity Company, 2019), for the project activities and aspects, is provided in **Table 31** below.

Table 31: Risks identified for the project activities and aspects (The Biodiversity Company, 2019)

Phase	Activity	Aspect	Impact
Construction	Site preparation and excavations	Clearing of areas in preparation for construction	<ul style="list-style-type: none"> • Contamination (from spills/leaks) • Impaired water quality • Increased storm water • Altered flow regimes • Altered flood frequencies • Siltation of receiving system • Flow sediment equilibrium change
		Construction of temporary and permanent access routes	
		Drainage patterns change due to levelled surfaces and storm water management	
		On-site vehicle and machinery activities	
		Temporary infrastructure during construction i.e. laydown yards, mixing areas, ablutions etc.	
		Increased footprint area of hardened surfaces	
		Storm water management	
		Installation of culverts/pipes and drains for storm water management	
		Storage of chemicals (hazardous material)	
		Ablutions and waste handling	
Operational	Operation of hospital	Drainage patterns change due to levelled surfaces and stormwater management	<ul style="list-style-type: none"> • Contamination (from spills/leaks) • Impaired water quality • Increased storm water • Altered flow regimes • Flow sediment equilibrium change
		Increased footprint area of hardened surfaces	
		Stormwater management	
		Increased traffic	

The study concluded that the significance of the risks posed to any local watercourses was determined to be low, and no watercourses will be directly impacted on by the project.

Mitigations measures have been prescribed in the study to further reduce the significance of any potential indirect impacts posed by the project. The measures provided were incorporated into the EMPr (**Appendix H**).

16.7.2 Impact Assessment

16.7.2.1 Risk Matrix

The risk assessment presented in **Table 32** and **33** was conducted in accordance with the DWS risk-based water use authorisation approach and delegation guidelines.

Please refer to the methodology used by the Specialist in the report (see **Appendix E2**).

16.7.2.2 Mitigation Measures

The following general mitigation measures are recommended:

- ❖ Ensure all activities and structures are restricted to the project area only. Do not permit any activities beyond the boundary of the project area. This will ensure that no watercourses will be directly affected by the project;
- ❖ Laydown yards and storage areas must not be within the local watercourses. These areas should be away from the watercourses, and measures should be in place to avoid indirect impacts (spills and leaks) to the systems;
- ❖ All chemicals, fuels and toxicants to be used for the construction must be stored within the project area in a bunded area;
- ❖ All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site;
- ❖ All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”;
- ❖ Have action plans on site, and training for contractors and employees in the event of spills, leaks and other impacts to the channel system;
- ❖ Works should be limited to dry periods;
- ❖ No dumping of construction material beyond the project area boundary. All waste must be collected on site and disposed of at licensed depots; and
- ❖ Adequate sanitary facilities and ablutions must be provided for all personnel.

Due to the fact that no rivers or wetlands are located within the project area, with the nearest system being in excess of 250 m from the project area, no monitoring has been prescribed. In support of this, the significance of potential risks were all determined to be low.

Table 32: Risk Assessment Matrix (The Biodiversity Company, 2019)

Phase	Severity					Severity	Spatial scale	Duration	Consequence
	Aspect	Flow Regime	Water Quality	Habitat	Biota				
Construction	Clearing of areas in preparation for construction	2	2	2	2	2	2	2	6
	Construction of temporary and permanent access routes	2	2	2	2	2	2	2	6
	Drainage patterns change due to levelled surfaces and storm water management	2	1	2	2	1.75	2	3	6.75
	On-site vehicle and machinery activities	1	2	1	2	1.5	2	3	6.5
	Temporary infrastructure during construction ie laydown yards, mixing areas, ablutions etc	1	1	2	1	1.25	1	3	5.25
	Increased footprint area of hardened surfaces	2	1	2	2	1.75	2	3	6.75
	Storm water management	1	2	1	2	1.5	2	3	6.5
	Installation of culverts/pipes and drains for storm water management	2	2	1	2	1.75	2	3	5.75
	Storage of chemicals (hazardous material)	1	1	1	1	1	1	3	5
	Ablutions and waste handling	1	1	1	1	1	1	3	5
Operational	Ablutions and waste handling	2	1	2	2	1.75	2	3	6.75
	Drainage patterns change due to levelled surfaces and storm water management	2	1	2	2	1.75	2	3	6.75
	Increased footprint area of hardened surfaces	1	2	1	2	1.5	2	3	6.5
	Storm water management	1	1	1	2	1.25	2	3	6.25

Table 33: Risk Assessment Matrix Continued (The Biodiversity Company, 2019)

Phase	Aspect	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Sig.	Risk Rating
Construction	Clearing of areas in preparation for construction	3	2	1	2	8	48	Low
	Construction of temporary and permanent access routes	3	2	1	2	8	48	Low
	Drainage patterns change due to levelled surfaces and storm water management	3	2	1	2	8	54	Low
	On-site vehicle and machinery activities	3	2	1	2	8	52	Low
	Temporary infrastructure during construction ie laydown yards, mixing areas, ablutions etc	3	1	1	2	7	36.8	Low
	Increased footprint area of hardened surfaces	3	2	1	2	8	54	Low
	Storm water management	3	2	1	2	8	52	Low
	Installation of culverts/pipes and drains for storm water management	3	2	1	2	8	48	Low
	Storage of chemicals (hazardous material)	3	1	1	2	7	35	Low
	Ablutions and waste handling	3	1	1	2	7	35	Low
Operational	Drainage patterns change due to levelled surfaces and storm water management	3	2	1	2	8	54	Low
	Increased footprint area of hardened surfaces	3	2	1	2	8	54	Low
	Storm water management	3	2	1	2	8	52	Low
	Increased traffic	3	2	1	2	8	50	Low

16.8 Terrestrial Ecology

16.8.1 Potential Impacts

Information provided in this section was sourced from the Terrestrial Ecological Impact Assessment (**Appendix E5**).

Potential impacts to flora and fauna during the construction phase, include the following:

- ❖ Loss of plant Species of Conservation Concern (SCC) and protected trees due to vegetation clearance;
- ❖ Destruction of indigenous flora during site establishment;
- ❖ Inadvertent killing and injury of fauna species during vegetation clearance;
- ❖ Potential loss of soil due to fuel and chemical spills (soil contamination);
- ❖ Encroachment, proliferation and spread of weeds and alien invasive plant species;
- ❖ Loss/displacement of Red listed and protected fauna species potentially present on site;
- ❖ Loss of topsoil and increased erosion;
- ❖ Disturbance of local fauna populations due to construction activities and
- ❖ Loss of flora and fauna habitat due to vegetation clearance.

Potential impacts associated with the operational phase, include the following:

- ❖ Alien Invasive Plant species and weeds
- ❖ Erosion caused by inadequate/failing stormwater management measures/designs;
- ❖ Disturbance of local faunal communities ; and
- ❖ Soil contamination from hazardous substance spillages outside their primary and secondary containment during maintenance work.

The potential disturbance of soil and vegetation during construction within natural vegetation encourages the establishment of pioneer vegetation, in many cases creating an ideal opportunity and optimal conditions for weeds and alien invasive plants to invade both disturbed and adjacent undisturbed areas after construction has ended. Alien Invasive plants can have far reaching detrimental effects on indigenous vegetation and has been widely accepted as being a leading cause of biodiversity loss. The large amount of disturbance created during construction will leave the study area and adjacent undeveloped areas vulnerable to alien plant invasion. Failure to manage rehabilitation and landscaping well can lead to serious alien invasive plant infestation.

If disturbed areas are not rehabilitated/re-vegetated post construction, erosion may continue throughout the operational phase of the development. This is likely to be exacerbated by

stormwater runoff from any hardened/impermeable surfaces such as roads, compacted soil, etc. Due to the extensive disturbance likely to be created by construction within the facility, this impact is most likely to occur within the facility, but could potentially occur outside the facility as well if suitable avoidance and mitigation measures were not implemented during construction.

Increased levels of noise, disturbance and human activity during operation may be detrimental to fauna. The risk of illegal hunting/poaching/trapping of wildlife for various uses is likely to remain as long as humans occupy the facility. Many species would however become habituated to the facility and would return to normal activity after some time. Direct faunal impacts during operation are likely to be limited to the facility. The operational phase of the proposed development will be permanent. The proposed development is bordered by an existing residential development to the north and a national road to the south. It is likely that faunal species in the area are habituated to human activity. Therefore, the operational phase of the proposed development is unlikely to result in any significant increase in disturbance to local faunal populations. Potential impacts on local faunal species as a result of disturbance/displacement has been assessed as not significant at a local scale.

During operation, hazardous waste stored and handled at the facility could enter the environment through improper waste management or spillages and potentially cause harm to fauna and flora. Exposure to contaminants, could lead to mortality, the destruction of their habitat, food and resources. This impact is most likely to occur within the facility, but could potentially occur outside the facility as well if suitable management measures are not implemented.

16.8.2 Impact Assessment

The impact assessment sourced from the Terrestrial Ecological Impact Assessment (see **Appendix E5**) is provided in the tables to follow.

FLORA PRE – CONSTRUCTION PHASE						
Potential Impact	Mitigation					
<p>Loss of plant species of conservation concern and protected trees due to vegetation clearance.</p> <p>In the case of this study area, vegetation is fairly disturbed, but still maintains a cover of some indigenous plant species. No loss of specific unique ecosystems or important and sensitive habitats are anticipated. It is anticipated that the whole study area will be cleared of vegetation and in case where the <i>Boophone disticha</i> and Marula trees could not be avoided, it is recommended that <i>Boophone disticha</i> and other geophytes/succulents (such as <i>Aloes</i>) found within the study area, be translocated to the outside of the development footprint with a similar habitat. These plant species are not endemic to the province and their densities within the study area are low. The distribution of these plant species within the study area is indicated in Tables 5 & 6. The impact is site specific and localised. With the implementation of mitigation measures (notably the medium sensitivity, which is where these plant species were recorded in abundance), the impact significance of the loss of important species may further be reduced.</p>	<ul style="list-style-type: none"> • It is recommended that search, rescue and relocation be conducted taking into consideration species of conservation concern noted on the study area, namely <i>Boophone disticha</i>. In order to successfully search, rescue and relocate this plant SCC, a Plan of Action/Guideline has been developed and is attached in Appendix D. A rescue and relocation plan must be implemented, and all rescue and relocation activities should be overseen by a suitably qualified specialist. • As far as possible, large specimens of the Marula trees, should be preserved and incorporated into the landscaping around the proposed infrastructure. Where this proves not to be possible, a permit will be required from the LEDET/DAFF to destroy or damage the trees • Development planning must ensure that loss of vegetation due to clearing is restricted to within the footprint. • Commencement of construction must be preceded by a plant rescue programme which must be conducted only when plant permits and licences have been issued by the relevant authorities. • Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness as to conservation and importance of plant SCC, no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc. • Temporary lay-down areas and construction camps should be located within areas that have been identified as being of low sensitivity. • Environmental Control Officer (ECO) should provide supervision and oversight of vegetation clearing activities. 					
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Permanent	Almost certain	2
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Likely	1

FLORA PRE – CONSTRUCTION PHASE						
Potential Impact			Mitigation			
<p>Destruction of indigenous flora during site establishment.</p> <p>The Contractor is to produce a site plan for the approval by the Project Manager/Engineer prior to the establishment of the site, which will aim to identify construction activities, facilities and structures in relation to areas with natural vegetation. Facilities and structures shall be located with due cognisance of the terrain and geographical features of the study area. However, the study area falls within the Polokwane Plateau Bushveld, which is listed as least threatened. The site is already degraded due to illegal dumping of materials and access routes. Alien invasive plant species and weeds dominate the study area. According to the Limpopo Conservation plan, the study area is situated in Other Natural area, and no CBAs or ESAs are present on site.</p>			<ul style="list-style-type: none"> • Development planning must ensure loss of vegetation and disturbance is restricted to within the recommended site layout footprint. • All laydown, storage areas, site camps etc. should be restricted to within the project area and should preferably be situated within areas of low sensitivity. • Clearly demarcate the construction footprint prior to clearing of vegetation. Only areas earmarked for site establishment should be cleared during pre-construction stage. Areas cleared of vegetation must be re-vegetated prior to contractor leaving the site. • Rehabilitate all disturbed areas outside of the proposed hospital footprint, which were affected by site clearance, as soon as the construction is completed. • Ensure that all construction personnel have the appropriate level of environmental awareness and competence. • Building material, ablution facilities or construction vehicles should not be stored in areas containing natural vegetation. • Vehicles and construction workers should under no circumstances be allowed outside the construction footprint to prevent impact on the surrounding natural vegetation. • Proliferation of alien invasive plant species is expected within the disturbed areas and they should be eradicated and controlled to prevent further spread. • Surrounding areas with indigenous vegetation should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste. • Topsoil removed during site establishment should be not be mixed with subsoil. Wind and water erosion-control measures are to be implemented to prevent loss of this topsoil. • Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grasses adapted to the local environmental conditions. The grass seeds should have a variety of grass species including several pioneer species. 			
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Long-term	Almost certain	2
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Likely	2

FAUNA PRE – CONSTRUCTION PHASE							
Potential Impact			Mitigation				
<p>Loss and displacement of animals on site due to habitat loss and mortality.</p> <p>Based on the results of the field surveys, the study area offers little or no suitable habitat for fauna species of conservation concern to occur. Birds and medium-sized mammals would be able to flee at the start of construction. However, small mammals (e.g. rodents) and much of the herpetofauna may hide in leaf litter and are likely to be killed by construction machinery. Other common causes of fauna mortality include vehicle-wildlife collision, hunting, snare, poisoning by construction workers. Blasting and vibrations noise can also negatively affect fauna, particularly nesting and roosting birds. Even though the Polokwane Plateau Bushveld on site is disturbed and degraded, suitable foraging habitat for Red data bird species such as Southern Bald ibis, Secretary bird, Lanner Falcon and Short-clawed Lark still exists. The use of vehicles and heavy machinery on site, especially during the early stages of construction, may result in death or disturbance of fauna. However, due to modified and degraded nature of the study area, this impact is rated as low. The implementation of the proposed mitigation measures would ensure that the potential impact remains of very low significance</p>			<ul style="list-style-type: none"> • Training of construction personnel to recognise threatened animal species will reduce the probability of fauna being harmed unnecessarily. • The contractor must ensure that no faunal species are disturbed, trapped, hunted or killed during the pre-construction phase. • Vehicles must adhere to the set speed limit. • All construction vehicles must use designated access roads. Off-road driving should be strictly prohibited. • No dogs or other domestic pets should be allowed at the site. • Fauna (mammals and reptiles) that become trapped in any excavation or in any construction related activity may not be harmed and must be rescued and relocated by a suitably qualified person. • During site preparation, special care must be taken during the clearing of the works area in order to minimise damage or disturbance of roosting and nesting sites. • Ground clearing should preferably take place at the beginning of winter in order to minimise impacts on young of burrowing animals and nesting birds. • Where possible, work should be restricted to one area at a time, as this will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed area close to their natural territories. • Informal fires by construction personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed. • Any fauna threatened by the construction activities should be removed to safety by the ECO or any suitable qualified person. 				
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance	
	Negative	Local	Medium	Medium-term	Likely	2	
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance	
	Negative	Local	Low	Short-term	Likely	1	

FLORA CONSTRUCTION PHASE						
Potential Impact		Mitigation				
<p>Potential loss of soil due to fuel and chemical spills (soil contamination).</p> <p>Groundwater quality may also be impacted by inappropriate waste disposal and spillages during construction. Inadequate management of construction materials and fuel could lead to spillages, notably of machine oil. Other hazardous substances that may be in use during the construction include paints. With mitigation measures, this impact is likely to have a low significance and it is site specific/localised.</p>		<ul style="list-style-type: none"> • The application of prevention measures, in addition to proper handling of hazardous waste will be mandated to each personnel operating on the site to ensure protection of the environment. • Storage containers must be regularly inspected to enable early detection of leaks. • Mixing of all chemicals and hazardous substances must take place on a tray, shutter boards or on an impermeable surface and must be protected from the ingress and egress of storm water. • The spillage of harmful or toxic substances can be mitigated by the implementation of best practice management measures for the storage and handling of all hazardous substances as well as through the implementation of a sound emergency spillage containment plan, which can be implemented as soon as the spill of harmful or toxic substance occurs. • Make sure construction vehicles are maintained and serviced to prevent oil and fuel leaks. • Emergency on-site maintenance should be done over appropriate drip trays and all oil or fuel must be disposed of according to waste regulations. Drip-trays must be placed under vehicles and equipment when not in use. • Material Safety Data Sheets (MSDSs) shall be available on site for all hazardous substances used on site. • Cement/concrete batching is to be located in an area to be hardened and must first be approved by the ECO and no batching activities shall occur directly on the ground. • The Contractor must ensure that all hazardous storage containers and storage areas comply with the relevant SABS standards to prevent leakage. All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil. • Vehicle maintenance should not take place on site unless a specific lined and bunded area is constructed within the construction camp for such a purpose. • Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and rehabilitated timeously and appropriately. • Contaminated water containing cement, fuel, oil or other hazardous substances must never be released into the environment. It must be disposed of at a registered hazardous landfill site. 				
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Medium-term	Almost certain	2
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Likely	1

FLORA CONSTRUCTION PHASE						
Potential Impact			Mitigation			
<p>Encroachment, proliferation and spread of weeds and alien invasive plant species.</p> <p>Alien invasive plants growing on the site can result in the further spread of the species to surrounding areas through dispersal pathways that may develop through daily construction activities.</p> <p>Before mitigation, the establishment of invasive alien plant species is considered as high but with effective development and ongoing implementation of an invasive control plan, it can be reduced to a low impact.</p> <p>A method statement for invasive alien control is shown in Appendix E. A list of Alien invasive plants and weeds found within the study area is shown in Table 4.</p>			<ul style="list-style-type: none"> • Alien invasive plants (listed in this study) can be removed manually or with the help of simple tools. This entails damaging or removing the plant by physical action. Different techniques could be used, e.g. uprooting, ring-barking or bark stripping. These control options are only really feasible in sparse infestations or on small scale, and for controlling species that do not coppice after cutting. Species that tend to coppice, need to have the cut stumps or coppice growth treated with herbicides following the mechanical treatment. It would be preferable to uproot alien vegetation to limit regrowth after cutting. • Topsoil stockpiles, in particular, should be kept free of alien and alien invasive plant species. • A 'Tree Popper' can be used to remove shrubs and smaller trees or alternatively, the top growth can be cut off and then the stem and roots can be removed from the soil. • For large stands of trees on site should they are too large for physical removal, ring-barking the tree should be considered • To prevent unnecessary alien plant infestations, an alien plant monitoring and eradication programme needs to be developed by a suitable person with a botanical expertise of the region. • Promote awareness of all personnel. • Chemical control should only be used as a last resort, since it is hazardous for natural vegetation. It should not be necessary if regular monitoring is undertaken, which should be effective for controlling alien invasive plants. • Regular monitoring for alien invasive plants within the study area as well as adjacent areas which receive runoff from the facility as there are also likely to be prone to invasion problems. 			
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	High	Long-term	Almost certain	2
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Likely	1

FLORA CONSTRUCTION PHASE						
Potential Impact		Mitigation				
<p>Loss of topsoil and increased erosion.</p> <p>The large amount of disturbance created during construction will leave the site vulnerable to soil erosion. In addition, the large amount of hardened surface created by the development will generate significant amounts of runoff during occasional storm events and this will also pose a potential erosion hazard to those areas receiving the runoff. With mitigation measures, this impact will be low and localised.</p>		<ul style="list-style-type: none"> • The construction activities should be set up in such a way that the area of exposed soil is minimised during times of the year when the potential for erosion is high, e.g. during the summer when intense rainstorms are common in Limpopo province. • Stripped topsoil, after removal of vegetation, shall be stockpiled separately in the designated areas and must not be compacted in any way, nor should any object be placed or stockpiled upon it. • During site preparation, topsoil and subsoil are to be stripped separately from each other and must be stored separately from spoil material for later use in the rehabilitation phase. It should be protected from wind and rain, as well as contamination from diesel, concrete or wastewater. • Sediment barriers or sediment traps such as silt fences, sandbags etc. must be established to curb erosion and sedimentation where necessary. • Topsoil stockpiles are not be used as storm water control features. • Storm water runoff from the stockpile sites and other related areas must be directed into the storm water system with the necessary pollution prevention measures such as silt traps and may not run freely into the surrounding areas. • Stockpiles are to be stabilised if signs of erosion are visible. • Topsoil stockpiles must be monitored for alien invasive plants growth. • All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised. • No plant, workforce or any construction-related activities may be allowed onto the topsoil stockpiles. • Topsoil stockpiles must be clearly demarcated as no-go areas. • Stockpiles must not be higher than 2 m in order to avoid compaction, and thereby maintain the soil integrity and chemical composition. • All slopes that are disturbed during construction shall immediately be stabilised to prevent erosion. Where revegetation of slopes is undertaken, this shall be done in consultation with the landscape architect (or appointed landscaper). 				
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Medium-term	Almost certain	2
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Likely	1

FAUNA CONSTRUCTION PHASE						
Potential Impact		Mitigation				
<p>Inadvertent killing and injury of fauna species during vegetation clearance.</p> <p>Blasting and vibrations noise can also negatively affect fauna, particularly nesting and roosting birds. The use of vehicles and heavy machinery on site, especially during the early stages of construction, may result in death or disturbance of fauna. Traffic on the access and service roads poses a significant risk to many animals, particularly during the construction phase when traffic volumes on the roads are likely to be heavy. Any fauna accidentally killed should be reported and a log of such mortalities maintained. Species such as rats observed on site are tolerant to disturbances and will easily move away. Due to modified and degraded nature of the study area, this impact after mitigation measures is rated as low.</p>		<ul style="list-style-type: none"> • If possible, the clearance of vegetation should commence during non-breeding season of fauna species (i.e. winter). • Before and during the vegetation clearance, any larger fauna species noted on site should be given a chance to move away from the construction activities. • Any fauna threatened by the construction activities should be removed to safety by a suitable qualified ECO or an Ecologist. • All personnel should undergo an environmental induction with regards to fauna, in particular awareness about harming or collecting species such as snakes, tortoises. • The Contractor and his/her employees shall not bring any domestic animals onto site. • Caution should be taken to ensure construction footprints are kept to an absolute minimum, including storage of materials, stockpiling etc. • If trenches are to be dug for water pipelines or electrical cabling, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are left open should have places where there are soil ramps, which will allow fauna to escape the trench. • No animals should be intentionally destroyed or killed, and no hunting or poaching of animals is allowed in the project site or adjacent areas. • No food or similar waste that may attract wild animals should be disposed of at the site. All food and litter waste should be placed in sealed bins and removed from the site each day. • Where construction vehicles must traverse the site, they must remain on demarcated roads. If vehicles must leave the road for construction purposes, they should utilize a single track and should not take multiple paths. • In order to reduce collisions of vehicles with fauna, speed limits should apply to all roads and vehicles using the site, a maximum of 40 km/h is recommended. Animals should have right of way. 				
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Medium-term	Almost certain	2
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Unlikely	1

FAUNA CONSTRUCTION PHASE						
Potential Impact		Mitigation				
<p>Loss/displacement of Red listed and protected fauna species potentially present on site</p> <p>In principle, the study area offers suitable habitat and foraging areas for bird species such as Southern Bald ibis, Secretary bird, Lanner Falcon and Short-clawed Lark. However, the study area does not provide breeding habitats for these bird species. The project area supports relatively low faunal diversity, due the high proportion of modified habitat present and the high level of fragmentation of natural habitat. During construction phase, noise, pollution, disturbance and human presence will be detrimental to fauna. Sensitive and shy fauna would move away from the area as a result of the noise and human activities present</p>		<ul style="list-style-type: none"> • The contractor must ensure that no fauna species are trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance. • Where construction vehicles must traverse the site, they must remain on demarcated roads. If vehicles must leave the road for construction purposes, they should utilize a single track and should not take multiple paths. No construction should take place during the night in order to avoid collisions with nocturnal fauna (e.g Brown hyena, owls, nightjars etc.) • In order to reduce collisions of vehicles with fauna, speed limits should apply to all roads and vehicles using the site, a maximum of 40 km/h is recommended. Animals should have right of way. • No dogs or cats should be allowed on site. Stray animals must be rehomed or taken to the SPCA and not allowed to inhabit the site • If trenches are to be dug for water pipelines or electrical cabling, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Trenches which are left open should have places where there are soil ramps, which will allow fauna to escape the trench. • Reduce direct mortalities by allowing for fauna to cross the haul roads safely. • If possible, the clearance of vegetation should commence during non-breeding season of fauna species (i.e. winter). Should the clearance of vegetation falls within the breeding season (September to March), a qualified Ecologist should conduct a pre-construction survey of all potential Red data bird nesting habitats in the project area. If no nests are present, then no further mitigations are required. However, if nests are found on site, site specific mitigations measures must be provided, which could include appropriate buffer zones. • Due to excessive dust generated during construction activities, a dust monitoring system should be implemented. Water or dust control agents should be used in working areas and haul roads should be sprayed on a regular basis. • Education and training of construction workers to ensure that they do not hunt, or otherwise disturb, bird populations. 				
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Medium-term	Almost certain	2
With Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Likely	1

CONSTRUCTION PHASE						
Potential Impact	Mitigation					
<p>Loss of flora and fauna habitat due to vegetation clearance.</p> <p>During construction, the study area will be cleared from all vegetation to accommodate the project infrastructure. However, the site is highly fragmented and degraded and as such the impact is not expected to be high. Although protected trees and SCC were noted on site, these species are not restricted to the study area or endemic to the region. The study areas falls within the Polokwane Plateau Bushveld vegetation type, which is listed as least threatened. The site is already degraded due to illegal dumping of materials and access routes. Alien invasive plant species and weeds dominate the study area. According to the Limpopo Conservation plan, the study area is situated in Other Natural area, and no CBAs or ESAs are present on site. Potential impacts on the available habitat will be of local extent, of long-term duration There would be a residual impact after mitigation measures due to permanent loss of natural vegetation.</p>	<ul style="list-style-type: none"> • No clearing of vegetation outside of development and infrastructure footprint are to take place. • Indigenous plants naturally growing within the project area, but that would be otherwise destroyed during clearing for development purposes, should be incorporated into rehabilitation and landscaping areas. Species commonly occurring within the Polokwane Plateau Bushveld vegetation type should be considered for rehabilitation measures. Marula trees should be re-planted as part of landscaping in order to compensate for those tree species destroyed during the construction activities. • Clear the area of all waste (including inert waste) and contaminated soil in preparation for landscaping. • All areas to be affected by the project will be landscaped after construction and all waste generated by the construction activities will be stored in a temporary demarcated storage area, prior to disposal thereof at an approved landfill site. All waste and construction material must be removed post construction prior to landscaping. • No open cooking or heating fires should be allowed as there is a significant risk of runaway fires on site. • Provide adequate ablution facilities to avoid use of natural areas as toilets. • Vehicles and construction workers should under no circumstances be allowed outside the construction footprint to prevent impact on the surrounding natural vegetation. • Proliferation of alien invasive species is expected within the disturbed areas and they should be eradicated and controlled to prevent further spread. • Surrounding areas with indigenous vegetation should under no circumstances be fragmented or disturbed further or used as an area for dumping of waste. • Exposed areas should be rehabilitated with a grass mix that blends in with the surrounding vegetation. The grass mix should consist of indigenous grasses adapted to the local environmental conditions. The grass seeds should have a variety of grass species including several pioneer species. 					
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Long-term	Almost certain	2
With Mitigation	Nature	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Medium-term	Likely	2

OPERATIONAL PHASE						
Potential Impact		Mitigation				
Erosion caused by inadequate/failing stormwater management measures/designs.		<ul style="list-style-type: none"> All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance. All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. All cleared areas should be revegetated with indigenous perennial grasses from the local area. Ensure that there is compliance with all national, regional and local legislation with regard to the disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials. 				
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Medium-term	Almost certain	2
With Mitigation	Nature	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Unlikely	1

OPERATIONAL PHASE	
Potential Impact	Mitigation
Soil contamination from hazardous substance spillages outside their primary and secondary containment during maintenance work.	<ul style="list-style-type: none"> Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards, which include the Hazardous Substances Act (Act No. 15 of 1973), the Occupational Health and Safety Act (Act No. 85 of 1993), relevant associated Regulations, and applicable SANS and international standards. A copy of the Material Safety Data Sheet (MSDS) for each hazardous substance stored or used must be available and communicated to the relevant persons who might be exposed to the hazards thereof. Areas where flammable liquids are being used, applied or stored, must be effectively ventilated. Install an adequate number of fire-fighting equipment in suitable locations around the flammable liquids store. All storage tanks containing hazardous substances must be placed in bunded containment areas with impermeable surfaces. The bunded area must be able to contain 110% of the total volume of the stored hazardous substance. Hazardous substances will be disposed of at registered sites or handed to registered hazardous waste disposal facilities for disposal / recycling.

OPERATIONAL PHASE						
Potential Impact		Mitigation				
		<ul style="list-style-type: none"> No flammable material (e.g. paper, cleaning rags or similar material) may be stored together with flammable liquids. Staff that will be handling hazardous materials must be trained to do so. <p>In case of accidental leakages and spillages, the following procedure will be followed:</p> <ul style="list-style-type: none"> Proper emergency response procedure to be in place and communicated to designated persons for dealing with spills and leaks. Ensure that the necessary materials and equipment for dealing with spills and leaks are available on site in the form of a Spill Kit/s. Remediation of the spill areas will be undertaken to the satisfaction of the Engineer and ECO. In the event of a hydrocarbon spill, the source of the spillage will be isolated and contained. The area will be cordoned off and secured. The Contractor will ensure that there is always a supply of an appropriate absorbent material readily available to absorb, breakdown and where possible, encapsulate a minor hydrocarbon spillage. All staff on site will be made aware of actions to be taken in case of a minor or major spillage. Provide contact details of person to be notified in a case of spillages – signage to be displayed at strategic points within the construction domain (e.g. workshop, fuel storage area, hazardous material containers). Construction vehicles and mobile plant to be maintained in a safe operating condition to prevent any possible hydrocarbon leakages resulting in spillages. Drip trays to be positioned underneath the hydrocarbon substance containment components of all stationary construction vehicles and mobile plant. 				
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Medium	Medium-term	Almost certain	2
With Mitigation	Nature	Extent	Magnitude	Duration	Probability	Significance
	Negative	Local	Low	Short-term	Unlikely	1

OPERATIONAL PHASE							
Potential Impact		Mitigation					
Disturbance of local fauna populations due to construction activities.		<ul style="list-style-type: none"> Animals residing within the designated area shall not be unnecessarily disturbed. However, any fauna threatened by operation activities should be removed to safety by a suitable qualified person. Snake handling should be strictly limited to qualified staff or a dedicated external snake handler. When accessing the facility, vehicles are to utilise the existing roads. Ensure that no unnecessary clearing of faunal habitat occurs during maintenance activities. No fires by maintenance personnel are allowed. No wild animal may be fed on site. Ensure that the facility is kept clean, tidy and free of rubbish that would attract animal pests. The collection or hunting of any animals at the facility or in the surrounding areas should be strictly forbidden. All vehicles accessing the site should adhere to a low speed limit (40km/h max) to avoid collisions with susceptible species such as snakes and small rodents. Ensure that staff understand that no form of wildlife poaching, killing, collecting or other form of disturbance can be permitted on the construction site or the adjacent areas. Monitoring impacts of operational activities on fauna so that adaptive management practises can be implemented if and when required. All waste generated at the facility should be kept in scavenger proof bins and removed from site at regular intervals. If the facility must be lit at night for security purposes, low-UV type lights (such as most LEDs), should be utilised as they do not attract insects. 					
During operational phase, noise, pollution, disturbance and human presence will be detrimental to fauna. Sensitive and shy fauna would move away from the area as a result of the noise and human activities present. Species such as rats observed on site are tolerant to disturbances and will easily move away. The impacts on these species are considered to be low.							
Without Mitigation	Status	Extent	Magnitude	Duration	Probability	Significance	
	Negative	Local	Medium	Medium-term	Almost certain	2	
With Mitigation	Nature	Extent	Magnitude	Duration	Probability	Significance	
	Negative	Local	Low	Short-term	Unlikely	1	

16.9 Socio-Economic Impact Assessment

16.9.1 Potential Impacts

Possible negative impacts to the socio-economic environment include (amongst others):

- ❖ Potential damage to property;
- ❖ Safety and security;
- ❖ Traffic on local roads;
- ❖ Impact to visual quality and sense of place;
- ❖ Nuisance from dust and noise during construction; and
- ❖ Light pollution.

Possible positive impacts to the socio-economic environment include (amongst others):

- ❖ Improvement of health care provision in Polokwane LM;
- ❖ Employment opportunities created during the construction and operation phases of the project.
- ❖ Skills transfer; and
- ❖ Sourcing of goods and services from local SMMEs (where possible).

16.9.2 Impact Assessment

The findings from the Socio-Economic Impact Assessment (refer to **Appendix E4**) follow.

16.9.2.1 Impact on Informal Inhabitants on Site

The construction of the hospital will have temporary impacts on informal habitants at the site which should not be overlooked. A legal assessment should be carried out closer to construction to determine if the inhabitants have legal rights to the areas they are occupying. Consideration should be given to their living standards and duration of occupation.

With this background, the assessment should cover whether or not Section 26 (3) of the South African Constitution applies, which provides that no one may be evicted from their home without a court order authorising such eviction after having due regard to “all the relevant circumstances”. It is important to note that human rights apply to all those in South Africa and those who live in it. The SAPS must act in accordance with the Constitution and treat those to be evicted in a dignified and respectful manner.

The assessment should also consider whether Sections 4(6) and 4(7) of the Prevention of Illegal Eviction from and Unlawful Occupation of Land Act, 1998 (Act No.19 of 1998) apply. This act clearly differentiates between unlawful occupiers based on the duration of their occupation. The assessment should also consider the inhabitant’s status in terms of the Unlawful Occupation of Land Act 1998 (Act No.19 of 1998).

The site’s inhabitants would be displaced by the project, however the transient nature of the occupation, leaves the authors with the impression that the inhabitants don’t sleep on the site every day, or that they move around the city as economic circumstances dictate. In this sense,

the inhabitants of the site are not traditionally defined informal dwellers and are rather classified as homeless or street dwellers. In addressing the question of their moving off site, the proponent should prepare a relocation plan in consultation with the site's inhabitants, and the plan should be implemented with due regard to the legal position as well as the needs of the inhabitants themselves.

Environmental Feature	Impact on the Informal Inhabitants on Site					
Project life-cycle	Pre-Construction phase					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
Displacement of current inhabitants on the site	<ul style="list-style-type: none"> NDOH and the Department of Social Development should arrange necessary social assistance with the local NGO's for the homeless people. This assistance should be carried out with due consideration of the Prevention of Illegal Eviction from and Unlawful Occupation of Land Act, 1998 (Act No.19 of 1998). If this act is found to apply owing to the condition of the site occupation or of the duration of the occupation, then the provisions of the act should apply, including, if applicable, the provision of alternative accommodation. The contractor is to safely remove any and all temporary shelter material that discovered during site clearing. Where damage occurs or the material is un-usable, it should be replaced in the hands of the user. 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Low	Permanent	Almost Certain	2
After Mitigation	Negative	Local	Low	Permanent	Almost Certain	1
Significance of impact and preferred alternatives	<p>The impacts can be successfully mitigated through the proponent's management of the displacement process, with the various social partners.</p> <p>The mitigation measure, if unsuccessful, will impact upon each homeless dweller, making for an un-supported relocation process. The impacts of this process will vary for each of the four dwellers.</p> <p>The negative impacts apply to the chosen site extent.</p>					

16.9.2.2 Impact on the Economy

The construction activity will impact the social environment both positively and negatively. Given the nature of the project area, construction activity is likely to cause a number of social nuisances to the nearby inhabitants at the Northern Academy Independent School, Edupark, and the Environmental management offices and nearby Flora Park residents. It is important to note that there are possible economic implications on the communities and commercial activities. Cumulative impacts can be both positive and negative. Cumulative impacts refer to the impacts that are incremental on the environment that results from the impacts of the proposed action when added to the existing foreseeable future actions. These impacts will be temporary in nature (by being restricted to the construction phase).

Environmental Feature	Impact on the Economy					
Project life-cycle	Pre-Construction phase, Construction Phase, Operational Phase					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
Access to healthcare	<ul style="list-style-type: none"> The provision of health care facilities will increase the public health of the area. The disease burden will be decreased. 					
Increase in employment	<ul style="list-style-type: none"> The development will result in employment generation at all skills levels from janitors to specialist medical professionals. Preferential treatment to local job seekers before employing labour from outside. 					
Skills development	<ul style="list-style-type: none"> The central hospital will cater to tertiary education to address medical, and health services skills shortages 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Positive	Regional	High	Permanent	Likely	3
After Mitigation	Positive	Regional	High	Permanent	Likely	3
Significance of impact and preferred alternatives	<p>Mitigation is not necessary for this positive impact.</p> <p>This mitigation measure does not influence the alternatives considered in the study.</p>					

16.9.2.3 Construction Impacts

Environmental Feature	Construction phase impacts					
Project life-cycle	Pre-Construction phase, Construction Phase,					
Potential Impact	Proposed Management Objectives / Mitigation Measures					
Skills transfer	<ul style="list-style-type: none"> NDoH must develop a skills development program for the duration of the construction activity. Beneficiaries of educational programs should be residents who live close to the project area. The selection process should be transparent. In order to increase the size of local employment, women should also be employed in the construction of the hospital. 					
Increased employment	<ul style="list-style-type: none"> Preferential treatment to local job seekers before employing labour from outside. One hundred percent of unskilled employment during the construction phase should come from local labourers who live in the study area. In order to increase the size of local employment, women should also be employed in the construction of the hospital. The selection process should be transparent. Where possible, labour intensive methods should be used. In order to increase the size of local employment, women should also be employed in the construction phase. 					
Local road condition	<ul style="list-style-type: none"> A condition survey of the local roads to be used during the construction phase should be made prior to construction Routes to be used should be defined and adhered to during the construction phase Maintenance of local roads should take place during the construction phase to ensure that the local roads used by the contractor are left in the same or better condition than they were prior to the start of construction 					

Dust	<ul style="list-style-type: none"> • Dust and disturbance can be mitigated through the use of appropriate dust suppression mechanisms • Mitigation measures management should be adhered to according to the relevant specialist studies.
Impact on SMMEs	<ul style="list-style-type: none"> • Construction and other materials to be sourced from local suppliers to boost the regional economic and drive the creation of more sustainable jobs. • SMME opportunities should be provided to everyone on an equal basis. Where possible, NDoH should support and encourage the development of SMMEs and local or regional suppliers. • Where possible, procurement should come from local and regional business so that the profits stay in the area, increasing economic activity. • NDoH should make use of existing council structures to identify beneficiaries of the program.
Impact on unlawful occupants	<ul style="list-style-type: none"> • NDOH and the Department of Social Development should arrange formal accommodation with the local NGO's for the homeless people.
Impact on Traffic	<ul style="list-style-type: none"> • Ensure that the necessary signage and traffic measures are implemented for safe and convenient access to the site. • Measures must also be put in place to ensure that these roads and any access points do not get built up with mud or sand. • Construction machinery drivers are to travel at appropriate speeds and have flashing lights attached to the roofs of the vehicles. • Applicable speed limits as set on regional roads must be observed at all times. • The number of vehicles present on site must be limited to the minimum.
Induced Migration	<ul style="list-style-type: none"> • NDoH must make a public announcement that imported labour will not take place on the project. • Contractors and sub-contractors must have strict conditions that prevent the importing of semi and unskilled labour without prior justification and approval • Employment of females and youth is encouraged to ensure the empowerment of the most vulnerable to unemployment and poverty. • People in search of work may move into the area. Locally based people should be given an opportunity • No staff accommodation should be allowed on site.
Noise Impacts	<ul style="list-style-type: none"> • Prior notice should be given to surrounding communities of blasting events • Construction work should take place during working hours – defined as 07h00 to 17h00 on weekdays and 07h00 to 14h00 on Saturdays. Should overtime work be required, that will generate noise, consultation with the affected community and stakeholders • Working hours should cater for the Northern Academy Independent School adjacent to the site.
Worker Safety and Security	<ul style="list-style-type: none"> • Erect signage and fences to deter theft. • During construction, the working site should be fenced to prevent trespassing and expansion of the working footprint. • All contractors' staff should be easily identifiable through their uniforms. • A security policy should be developed which amongst others requires that permission be obtained prior to entering any property (should the need arise), and provisions controlling trespassing by contractor staff.

	<ul style="list-style-type: none"> No staff, apart from security staff, should be allowed to reside at contractor camps. Contractors should establish a crime awareness programmes at their site camps. 					
Damage to property	<ul style="list-style-type: none"> The contractor is to make good any damage that occurs on any property as a result of construction work 					
	Nature	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	Negative	Local	Medium	Short Term	Almost Certain	3
After Mitigation	Negative	Local	Low	Short Term	Almost Certain	2
Significance of impact and preferred alternatives	<p>Disturbances during the construction phase can be successfully mitigated through contractor specifications issued at tender stage and through monitoring of contractor performance during the construction phase.</p> <p>Negative impacts owing to the construction will be experienced irrespective of the site.</p> <p>Should these mitigation measures prove unsuccessful, the surrounding business community will experience inconvenience and disruption during the construction phase. It should be noted that there are no residential communities in the vicinity of the site and there are no vulnerable facilities near the site.</p>					

Noise and Dust

During construction phase communities may be exposed to increased dust, noise and visual and other nuisance disturbances. The generation of dust stems from activities such as earthworks and trenching, as well as vehicular movement during construction phase. This situation will be worst during the dry season and during windy seasons. Airborne particulates may pose a hazard to residents in the vicinity or downwind of the construction sites that suffer from respiratory tract problems. Areas of particular concern are the Northern Academy Independent School, Edupark, and the Environmental management offices and nearby Flora Park settlement. Mitigation through dust suppression methods will allow for this impact to be effectively managed. During construction, heavy equipment will be required for the site clearance, pipelines excavations and backfilling and general transport, noise generation will be unavoidable. The degree of noise, frequency of noise and individual perception are all important considerations when determining the impact on noise. Drilling; blasting and construction activities will also create noise pollution. Adequate warning of high noise events such as drilling and blasting should be communicated to the affected communities.

Worker Health and Safety

The impacts of constructing can affect the health and safety of those working on the construction site; disturbance, health and income of the host communities; and disturbance to the environment and animals. These impacts can be mitigated in the Environmental Management Programme (EMPr) and through adherence to the Occupational Health and Safety Act 85 of 1993. An influx of worker is often characterised by higher health risks, particularly if the influx is male dominated. These include a higher disease burden and rise in HIV/AIDS rates. There should also be awareness and education campaigns on health and

social risks such as HIV/AIDS and crime prevention. The awareness education should be extended to the pupils of the institution in the vicinity of the project.

Security

The machinery found at the Environmental Management offices, school furniture and appliances may be vulnerable to theft due to the high influx of people during construction phase. Mitigation measures include NDoH, prior to construction, must consult with the directly affected stakeholders ensure the safety of the properties, belongings and residents. A security policy must be drafted and strictly enforced by the contractors, this would include requirement to obtain landowner permission prior to any property should the need arise. In addition, Contractor staff should be identifiable as such through the use of common work uniforms.

Local Road Condition and Traffic Impact

Local road access will be used during the project, and as a result these roads may be subject to damage. The project is to maintain the local roads for the duration of the contract and should leave them in a state the same or better than they were prior to the start of the construction phase. Heavy duty trucks and construction vehicles cause damage to the current road conditions as well as contribute to increased dust and congestion on the roads. The greater the number of trucks on the road, the greater the risk of road accidents occurring. It is important that the contractors are sensitive to the road conditions and ensure that throughout the construction process that these roads are maintained and suitable for small vehicles.

16.10 Agriculture

16.10.1 Potential Impacts

Potential impacts during the construction phase include:

- Clearance and permanent loss of moderate arable land; and
- Permanent alteration of soil resources on site.

16.10.2 Impact Assessment

The findings of the Agricultural Impact Assessment follow. Please refer to the methodology used by the Specialist in the report (see **Appendix E1**). The impact assessment was conducted on the following parameters:

Soil resources: The soil resources of the development site are variable depth well-drained soils predominantly of the Hutton form. Although the soil forms will be altered in their entirety the soil material serves as construction material. The infrastructure developed on the soils is considered to have a permanent impact on the alteration of the soils of the site.

Agricultural potential: The agricultural potential of the site is considered to be moderate (but low if the small extent of the area is considered) and with significant limitations due to the

surrounding urban developments. Due to the low baseline of the agricultural potential the impacts within the broader landscape and area are considered to be low but permanent.

16.10.2.1 Soil Resources

Potential Impacts	Proposed Mitigation							
SOIL RESOURCES								
Loss of quality and quantity topsoil	During site preparation, special care must be taken during the clearing of the construction works area and the site camp where topsoil material will be stored separately from the subsoil and spoil material to ensure for the protection thereof. This topsoil must be re-used during the rehabilitation phase. Erosion control measures must be implemented to ensure that the loss of topsoil is prevented. Important: Mitigation will have no beneficial effect on the impact site itself but may contribute to decreased sediment and erosion pressures immediately off site.							
		+/- Impacts	Extent	Magnitude	Duration	Probability	Significance	OS
	Without Mitigation	-	Local	Low	Permanent	Almost certain	Very low	-20
With Mitigation	-	Local	Low	Permanent	Almost certain	Very low	-20	

16.10.2.2 Agricultural Potential

Potential Impacts	Proposed Mitigation							
AGRICULTURAL POTENTIAL								
Loss of quality and quantity topsoil	The agricultural potential is linked to the soils that will be destroyed and has a low baseline. With the permanence of the structures on the site as well as the poor prognosis for complete rehabilitation to a pre-development state at some time in the future the impacts are considered to be permanent and therefore no mitigation is possible.							
		+/- Impacts	Extent	Magnitude	Duration	Probability	Significance	OS
	Without Mitigation	-	Local	Low	Permanent	Almost certain	Very low	-20
With Mitigation	-	Local	Low	Permanent	Almost certain	Very low	-20	

16.11 Air Quality

16.11.1 Potential Impacts

- ❖ Dust will be generated during the construction period from various sources, including blasting, trenching, operations at the batching plant(s), aggregate stockpiles, use of access roads, and transportation of spoil material, soil stockpiles and general construction activities on site.
- ❖ Sensitive receptors to dust and other air quality impacts in the study area include existing schools and residential areas.
- ❖ There will be no incinerator on site, therefore air quality will not be directly impacted on site during the operational phase. All medical waste will be temporarily stored and will then be collected and handled by a third registered party.

Mitigation measures are included in the EMPr to ensure that the air quality impacts during the construction phase are suitably monitored (dust fallout and particulate matter) and managed and that regulated thresholds are not exceeded. The EMPr also includes measures to control and minimize GHG emissions.

16.11.2 Impact Assessment

Environmental Feature	Air Quality
Project life-cycle	Construction phase
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
Excessive dust levels as a result of construction activities	<ul style="list-style-type: none"> Appropriate dust suppression measures or temporary stabilising mechanisms to be used when dust generation is unavoidable (e.g. dampening with water, chemical soil binders, straw, brush packs, chipping), particularly during prolonged periods of dry weather. Dust suppression to be undertaken for all bare areas, including construction area and access roads. Note that all dust suppression requirements should be based on the results from the dust monitoring and the proximity of sensitive receptors. Speed limits to be strictly adhered to. The Contractor will take preventative measures to minimise complaints regarding dust nuisances (e.g. screening, dust control, timing, and pre-notification of affected parties). Construction vehicles transporting loose material (such as soil or gravel) must be covered by a tarp, and such vehicles should not be overloaded. Dust fallout to be monitored (baseline and during construction). Sampling locations to consider major sources of dust and sensitive receptors.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium	short-term	almost certain	2

After Mitigation	-	local	low	short-term	almost certain	1
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16.12 Noise

16.12.1 Potential Impacts

During construction, localised increases in noise will be caused by blasting (if required), excavations, dumping and loading of materials, movement of construction vehicles on road and off road, and general construction activities on site (i.e. use of machinery), where vibrations would be felt close to where the construction equipment is in use. Noise from night-time construction activities will particularly impact on the quality of living of the affected people. Vibration will also be felt close to construction equipment. Noise that emanates from construction activities are addressed through targeted best practices for noise monitoring and management in the EMPr.

Project personnel working on the construction site will experience the greatest potential exposure to the highest levels of noise and vibration. Workplace noise and vibration issues will be managed as part of the Occupational Health and Safety Management System to be employed on site.

During the operation of the hospital, noise will emanate from attending visitors and staff, as well as emergency vehicles (i.e. ambulance and helicopter) arriving to and departing from the hospital. The noise which is generated from the use of the N1, situated to the south of the proposed site, will impact the operation of the hospital, and will thus need to be catered for in the design of the hospital.

16.12.2 Impact Assessment

Environmental Feature	Noise
Project life-cycle	Construction phase
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
Excessive noise levels as a result of construction activities.	<ul style="list-style-type: none"> The provisions of SANS 10103:2008 will apply to all areas within audible distance of residents. Working hours to be agreed upon with Project Manager, to minimise disturbance to surrounding landowners. No work must take place on Sundays or Public Holidays. Construction activities generating output levels of 85 dB or more will be confined to normal working hours. Noise preventative measures (e.g. screening, muffling, timing, pre-notification of affected parties) to be employed. Blasting operations (if required) to be controlled to ensure sound pressure levels are kept below the generally accepted 'no damage' level of 140 decibels. Surrounding landowners must be

	<p>informed in writing at least 24 hours before blasting is due to take place. Proof of notification must be kept on site.</p> <ul style="list-style-type: none"> • Survey potentially affected structures prior to and after blasting (if required). • Noise to be monitored (baseline and during construction). Sampling locations to consider major noise sources and sensitive receptors (neighbouring properties/schools).
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	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium	short-term	almost certain	3
After Mitigation	-	local	low	short-term	almost certain	2

16.13 Historical and Cultural Features

16.13.1 Potential Impacts

A Phase 1 Heritage Impact Assessment was conducted in accordance with the NHRA. Refer to **Section 15.5.4** for the key findings of this assessment.

The study indicated that during the construction, impacts may occur to Heritage and Palaeontological resources as identified for the project. These impacts will occur as a result of construction activities such as topsoil stripping, excavations and vegetation clearing.

The combined weighted project impact to the Heritage resources (prior to mitigation) will possibly be of a moderate to high negative significance. The impact will be permanent and is in all likelihood going to happen. The impact risk class is thus moderate to high. However, the implementation of the recommended mitigation measures will minimise the impacts and reduce the overall impacts to moderate to low.

The combined weighted project impact to the Palaeontological resources (prior to mitigation) will be of a low negative significance. The impact will be insignificant.

16.13.2 Impact Assessment

The findings from the Phase 1 Heritage Impact Assessment is presented in **Table 34**.

16.13.3 Mitigation

16.13.3.1 Heritage Sites

- ❖ The extent of the Iron Age site needs to be documented through surveying of the site and the development of site layout maps;
- ❖ Identified structures must be excavated with the aim of determining age, cultural affinity and utilization areas;

- ❖ Specific attention must be given to the excavation and documentation of identified middens on the site;
- ❖ After completion of the excavation, the collected material must be analysed for reporting purposes and then curated in a recognised provincial repository;
- ❖ A destruction permit must then be applied for with the backing of the mitigation report;
- ❖ This application for destruction must be lodged with the SAHRA under section 35 of the NHRA.
- ❖ Upon issuing of the destruction permit construction can commence.
- ❖ During the construction an archaeologist must monitor the site clearing as the possibility of encountering subsurface cultural and human remains are deemed to be high.

16.13.3.2 Palaeontology

A protocol for incidental palaeontological finds is required. This protocol should include the termination of all development work if any palaeontological finds are discovered on site, and SAHRA and a palaeontologist should be alerted to determine the way forward.

Table 34: Heritage Impact Assessment Table (PGS, 2019)

POTENTIAL IMPACTS (in order of impact as described in Impact Matrix)	ASPECT (refer to Impact Matrix)	Nature	Type	Extent	Duration	Severity	Reversibility	Irreplaceable Loss	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
											Without Mitigation	With Mitigation	
CONSTRUCTION PHASE													
Impacts on palaeontological resources	Heritage Resources	Negative	Direct	Site	Permanent	Low	Irreversible	Resource cannot be replaced	unlikely	High	Low	Low	Refer to Section 9 in the HIA Report
Impact on archaeological sites	Heritage resource	Negative	Direct	Local	Permanent	High negative	Irreversible	Resource cannot be replaced	Definite	Moderate or Partially Mitigatable	High	Moderate to Low	Documentation of the archaeological sites through excavations after which a destruction permit must be applied for.

16.14 Existing Structures and Infrastructure

16.14.1 Potential Impacts

Potential impacts of the project to existing structures and infrastructure include:

- ❖ Construction related disturbances (e.g. noise and dust);
- ❖ Disruptions to existing services (water, sewer, fibre etc.);
- ❖ Disruptions to traffic on local road network during construction and operation; and
- ❖ Damage to fencing and surrounding neighbouring schools, buildings, and infrastructure.

16.14.2 Impact Assessment

Environmental Feature	Existing Structures and Infrastructure
Project life-cycle	Construction & operational phases
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
Disruption of existing services	<ul style="list-style-type: none"> • Identify and record existing services and infrastructure. • Conform to requirements of relevant service providers and infrastructure custodians (e.g. Transnet, Roads Agency Limpopo, Eskom, Telkom, DMs and LMs, etc.). • Ensure access to infrastructure is available to service providers at all times. • Immediately notify service providers of disturbance to services. Rectify disturbance to services, in consultation with service providers. Maintain a record of all disturbances and remedial actions on site. • Notify neighbouring landowners in writing of any disruptions to essential services at least 24 hours prior to the planned disruption. An estimated time period for the disruption must also be provided. Proof of notification must be kept on site. • Adequate reinstatement and rehabilitation of affected environment.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	low	short-term	unlikely	2
After Mitigation	-	local	low	short-term	unlikely	1

16.15 Waste Management

16.15.1 Potential Impacts

The project will directly or incidentally generate various types of waste during the construction phase, such as:

- ❖ Waste generated from site preparations (e.g. plant material);
- ❖ Domestic waste;
- ❖ Surplus and used building material; and

- ❖ Hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags).
- ❖ Wastewater will be produced during construction from the sanitation facilities, washing of plant, operations at the batching plant, etc.
- ❖ Excess spoil material (soil and rock) will be generated as part of the bulk earthworks associated with the construction phase of the project.

The hospitals operational activities will generate various types of waste, such as:

- ❖ Medical waste, inclusive of HCRW.
- ❖ General waste;
- ❖ Liquid (effluent) waste;
- ❖ Hazardous waste; and
- ❖ Dangerous goods (i.e. fuel)

16.15.2 Impact Assessment

Environmental Feature	Waste Management
Project life-cycle	Construction phase
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
<ul style="list-style-type: none"> • The generation and storage of construction waste could cause pollution on site, if not properly managed. • Types of construction waste generated include domestic waste, spent grinding material, mixed concrete, paint cans and brushes, builders waste, and other construction waste. 	<ul style="list-style-type: none"> • Sufficient ablution facilities to be provided at the construction camp; • Suitable litter receptacles with functional (scavenger and rainproof) lids to be positioned strategically across the site at all working areas. Litter receptacles should be clearly labelled with the type of waste they should contain (e.g. general or hazardous). • Waste must be separated at source (e.g. containers for glass, paper, metals, plastics, organic waste and hazardous wastes). • Contractor shall dispose of all refuse generated on site or from construction activities. The contractor must dispose of waste regularly at an approved refuse disposal site, to ensure that waste does not build up on site and result in aesthetic impacts or odours. Proof of disposal must be kept on record. • Littering on site is prohibited. Clearly marked litterbins must be provided on site. • No hazardous materials, e.g. oil, diesel and fuel should be disposed of in the surrounding environment or down stormwater drains. Any diesel, oil or petrol spillages are to be collected and stored in specially marked containers and disposed of at a permitted waste disposal site and must be treated as hazardous waste. Proof of disposal must be kept on site. • Recycling of waste is to be encouraged by both the contractor and staff as far as possible on site; • Burning of waste material on site will not be permitted. • All vehicle parking areas and vehicle servicing areas (if required) are to be inspected carefully for diesel, oil and other spillages weekly.

	<ul style="list-style-type: none"> Spoil must not be illegally dumped, or disposed of at a facility that does not have the requisite licence or permit to accept and rework the waste. Spoil stockpile areas should be identified by the contractor and approved by the engineer and ECO, and should be within the approved authorised footprint. Waste management on site must comply with the national norms and standards (GN R. 926 of 29 November 2013) and Polokwane LM Waste Management By-Law (Local Authority Notice 69 of 2019).
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	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium	short-term	likely	3
After Mitigation	-	local	low	short-term	moderate	1

Environmental Feature	Waste Management
Project life-cycle	Operational phase
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures
<ul style="list-style-type: none"> All types of waste generated and temporarily stored on site from the hospital's operational activities, which includes, but is not limited to HCRW, hazardous waste, general waste, liquid (effluent) waste and dangerous goods (i.e. oils, fuels etc.) could cause pollution on site, if not properly managed. 	<ul style="list-style-type: none"> The operator of the hospital shall have a health care waste management plan in place, and the contents of that plan must comply with the Regulations relating to Health Care Waste Management in Health Establishments (GN No. R. 375 of 23 May 2014); Medical waste of all categories must be temporarily stored securely on site in dedicated rooms, to be collected and disposed of by an accredited service provider and be taken to a licenced hazardous waste disposal facility. Proof of such disposal must be kept on record; All general and hazardous waste temporarily stored at a waste management facility on site, should be collected, sorted, weighed and placed in skips and recycling containers for removal and disposal by an accredited service provider to an appropriate registered landfill sites (hazardous and general sites, as required). The storage areas will need to comply with the national norms and standards (GN R. 926 of 29 November 2013). Liquid (effluent) waste will connect to the municipal sewerage system. All documentation and registration on SAWIS must be in order and completed prior to operations commencing; Hospital personnel must be trained according to the hospitals approved Health Care Waste Management Plan; Waste management on site must comply with the national norms and standards (GN R. 926 of 29 November 2013) and Polokwane LM Waste Management By-Law (Local Authority Notice 69 of 2019). The operation of the mortuary on site must comply with the requirements as specified in the Regulations relating to the Management of Human Remains (GN No. R. 363 of 22 May 2013) in terms of the National Health Act, 61 of 2003.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium-high	short-term	unlikely	3
After Mitigation	-	local	low	short-term	rare	1

16.16 Traffic

16.16.1 Potential Impacts

During the construction period there will be a significant increase in traffic on the local road networks, due to the delivery of plant and material, transportation of staff and normal construction-related traffic. During the operational phase, there will be a large influx of people (staff and visitors) including vehicles, increasing the local traffic and use of residential roads surrounding the site.

A Traffic Impact Assessment was undertaken for the project and measures and recommendations from the aforementioned study, were incorporated into the EMP. Suitable mitigation and management measures in terms of traffic and use of local roads are included in the EMP in order to minimise traffic impacts during the construction and operational phase.

16.16.2 Impact Assessment

Environmental Feature	Traffic and Access				
Project life-cycle	Construction				
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures				
<ul style="list-style-type: none"> Disruptions to existing local road users Safety risks Increase in dust levels Use of local road network by construction vehicles 	<ul style="list-style-type: none"> Determine and document the road conditions of the access roads (Webster and Suid Street) that will be affected by construction traffic, as relevant. Maintain adequate road conditions. Obtain the necessary approval for road upgrades, pipe-jacking and wayleave for road construction from the relevant road authorities, as applicable. Clearly demarcate all construction access roads. Proper access control is to be maintained to prevent unauthorised access. Strict adherence to speed limits by construction vehicles on public roads and access roads. Appropriate speed limits need to be posted on all access roads according to the geometric design and limitations of heavy vehicles. The access roads need to provide sufficient width for heavy vehicles to navigate around curves in the road. Ensure appropriate traffic safety measures are implemented. Recommendations included in the traffic impact assessment are to be implemented. 				
+/- Impacts	Extent	Magnitude	Duration	Probability	Significance

Before Mitigation	-	local	medium	short-term	likely	2
After Mitigation	-	local	low	short-term	likely	1

16.17 Aesthetic Qualities

16.17.1 Potential Impacts

Potential visual impacts during the construction phase include:

- ❖ Clearing of vegetation;
- ❖ Construction-related activities;
- ❖ Light pollution;
- ❖ Inadequate waste management and housekeeping; and
- ❖ Inadequate reinstatement and rehabilitation of construction footprint.

Potential visual impacts during the operational phase include:

- ❖ High visibility of infrastructure;
- ❖ Loss of 'sense of place'; and
- ❖ Light pollution.

The EMPr includes measures to manage visual impacts and to rehabilitate areas affected by construction activities.

16.17.2 Impact Assessment

Environmental Feature	Aesthetic Qualities					
Project life-cycle	Construction & Operational phase					
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures					
Reduction of visual quality due to construction activities and development of vacant land.	<ul style="list-style-type: none"> • Lighting must not constitute an eyesore / hazard to users of the road and the surrounding community. • Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas. • The site will be shielded / screened to minimise the visual impact, where practicable. • Development designs to compliment the natural surroundings in order to preserve a sense of place, where practicable. • On-going housekeeping to maintain a tidy construction area. • After the construction phase, the areas disturbed that are not earmarked for operational purposes (part of infrastructure footprint) must be suitably rehabilitated. 					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	local	medium-high	short-term	almost certain	3

After Mitigation	-	local	low	short-term	moderate	1
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16.18 Health and Safety

16.18.1 Potential Impacts

Potential health and safety impacts to workers and the public associated with the project may include the following:

- ❖ Hazards/accidents related to construction work;
- ❖ Poor storage and handling of dangerous goods; and
- ❖ Safety and security.

These risks are addressed through mitigation measures identified in the socio-economic impact assessment (refer to **Section 16.9.2.2**). Best practices are provided in the EMP, which are compliant with the Occupational Health and Safety Act (Act No. 85 of 1993), Construction Regulations (2014) and other relevant regulations. Additional management requirements associated with health and safety, will be included in the Occupational Health and Safety system.

16.19 “No-Go” Option

16.19.1 Potential Impacts

Should the proposed project not go ahead, any potentially significant environmental issues associated with the project (refer to **Section 16**) would be irrelevant and the status quo of the local receiving environment would not be affected by the project-related activities.

The objectives of the project would however not be met, and there will continue to be an under provision of both regional and tertiary beds/services in the Limpopo Province.

The “no go option” needs to be considered in light of the motivation (see **Section 4**) as well as the need and desirability (see **Section 11**) of the proposed development.

The “no-go option” (i.e. should the project not proceed) will have the following implications:

- ❖ The referral system will be dysfunctional and there will continue to be an under provision of both regional and tertiary beds/services in the province.
- ❖ Patients will still be referred out of the province where the required tertiary services are not available and they will have to compete with patients from other provinces for beds as Mpumalanga refers to Limpopo hospitals adding continued strain on the resources as there are insufficient L2 and L3 beds;
- ❖ The fees expended to date will be fruitless expenditure;
- ❖ The teaching platform will be incomplete as the full spectrum of services will not be supplied. This will be exasperated by the fact that state of the tertiary hospital, Pietersburg, is in a poor condition and outdated. Major upgrade to this facility is essential;

- ❖ The province will continue to experience a lack of key specialists as working conditions continue to be inadequate and in a poor condition; and
- ❖ The risks will continue without sufficient resources in place.
- ❖ No local labour/SMME employment during construction.

16.19.2 Impact Assessment

Environmental Feature	“No-Go” Option					
Project life-cycle	All Phases of Project Life-Cycle					
Potential Aspects & Impacts	Proposed Management Objectives / Mitigation Measures					
<ul style="list-style-type: none"> • The referral system will be dysfunctional and there will continue to be an under provision of both regional and tertiary beds/services in the province. • The teaching platform will be incomplete as the full spectrum of services will not be supplied. • The state of the tertiary hospital, Pietersburg, is in a poor condition and outdated. Major upgrade to this facility is essential. • The province will continue to experience a lack of key specialists as working conditions continue to be inadequate and in a poor condition. • No local labour/SMME employment and skills development during construction. 	<ul style="list-style-type: none"> • Construction and operation of the Limpopo Central Hospital. 					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
Before Mitigation	-	regional	high	long-term	almost certain	3
After Mitigation	+	regional	high	long-term	almost certain	3

16.20 Cumulative Impacts

16.20.1 Potential Impacts

A cumulative impact, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities. Cumulative impacts can be identified by combining the potential environmental implications of the proposed Limpopo Central Hospital with the impacts of projects and activities that have occurred in the past, are currently occurring, or are proposed in the future within the project area.

The following potential cumulative impacts are associated with the proposed project:

- ❖ The construction period may cause traffic-related impacts in terms of the local road network, which will be associated with heavy vehicle construction traffic for the delivery of material and the transportation of construction workers. This may compound traffic impacts if other large-scale projects are planned during the same period. During the operational phase of the hospital, there will be an influx of people, which means there will be an increase in the number of road users along the existing local roads surrounding the site.
- ❖ Land clearing activities and other construction-related disturbances could lead to the cumulative loss of bushveld vegetation as well as the proliferation of exotic vegetation.
- ❖ There will be an increase in the dust and noise levels during the construction phase, as a result of earthworks and site clearance, which will impact the neighbouring properties.
- ❖ Potential impact to groundwater from poor management of storing and handling of dangerous goods/hazardous substances, which may have an indirect impact on surrounding users of groundwater.
- ❖ The hospital will require bulk services (i.e. water and sanitation, power supply) which will tap into existing service networks, which places additional stress on the existing services in the area; and
- ❖ The operation of the proposed Limpopo Central Hospital will provide a positive contribution not only to Polokwane and the Limpopo Province, but to the country. The hospital will stimulate the economy both on a macro and micro level. Benefits will be in the form of employment opportunities, especially locally; the provision of goods and services; improvement of the skills of the students passing through the Medical School who, by virtue of their increased earning power, improved economic activity; improving the number of health professionals in the region thereby improving the health of the people in that region which, in turn, due to its focus on preventive practice, reduces the burden of disease and the associated drain on the fiscus. This should particularly affect the maternity and neonatal mortality rates which in itself will increase longevity and the added benefits to the economy.

17 ANALYSIS OF ALTERNATIVES

By conducting a comparative analysis of alternatives, the Best Practicable Environmental Option (BPEO) can be selected with technical and environmental justification. Münster (2005) defines BPEO as the alternative that “provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term”.

As discussed in **Section 6**, the only alternatives that were considered as part of this Scoping and EIA Process, was the preferred layout (as discussed in **Section 6.2.2**) and the “no-go” option alternative (as discussed in **Section 6.3**).

Refer to **Section 16. 19** for the implications associated with the “no-go” option.

The BPEO for the proposed Limpopo Central Hospital was determined to be the current proposed site layout (refer to **Figure 47**), which was preferred over the “no-go” alternative.



Figure 47: BPEO

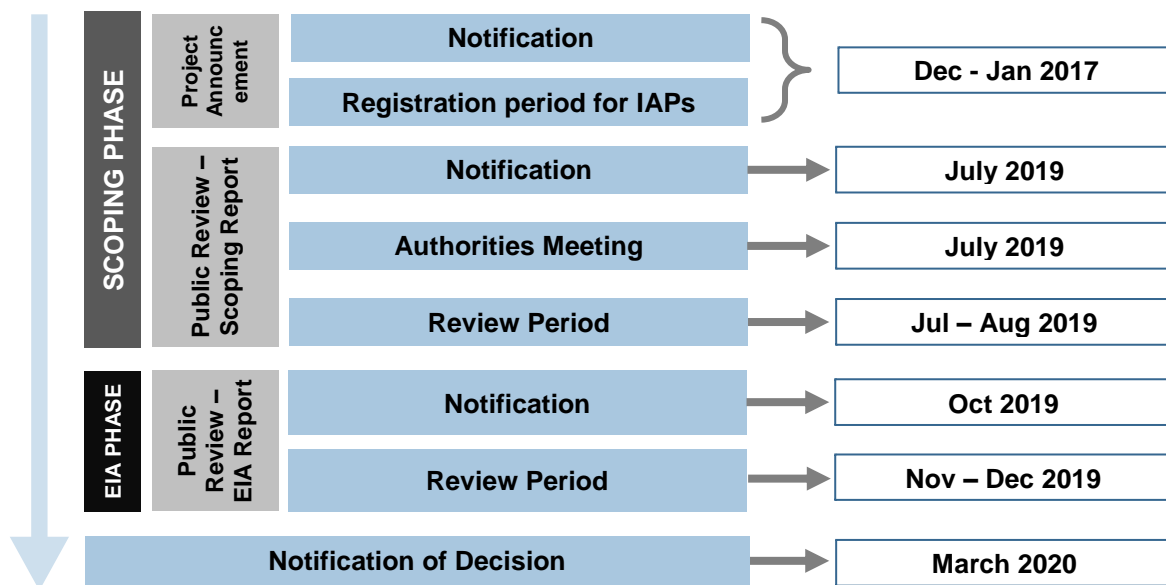
18 PUBLIC PARTICIPATION

18.1 General

The purpose of the public participation process includes:

- ❖ Providing IAPs with an opportunity to obtain information about the project;
- ❖ Allowing IAPs to express their views, issues and concerns with regard to the project;
- ❖ Granting IAPs an opportunity to recommend measures to avoid or reduce adverse impacts and enhance positive impacts associated with the project; and
- ❖ Enabling the project team to incorporate the needs, concerns and recommendations of IAPs into the project, where feasible.

The public participation process that was followed for the proposed Limpopo Central Hospital is governed by NEMA and GN No. R 982 of 4 December 2014 (as amended). **Figure 48** outlines the public participation process for the Scoping phase (completed) and EIA phase (current). Note that the dates may change due to the dynamic nature of the EIA process.



Note: Dates may change during the course of the EIA

Figure 48: Outline of Public Participation Process

18.2 Public Participation during the Project Announcement and Scoping Phase

The primary tasks undertaken as part of public participation during the project announcement and Scoping phase included the following (details provided in Scoping Report):

1. Compiling a database of IAPs;
2. Notifying the direct and adjacent affected landowners of the project;

3. Announcing the project, which included distributing a Background Information Document (BID) and Reply Form, erecting onsite notices, placing newspaper notices;
4. Notifying IAPs of the review of the Draft Scoping Report, by erecting onsite notices, placing newspaper notices and distributing notices via email and SMS;
5. Convening an authority meeting to present the Draft Scoping Report;
6. Granting IAPs and authorities an opportunity to review the Draft Scoping Report; and
7. Compiling and maintaining a Comments and Responses Report.

18.3 Public Participation during the EIA Phase

18.3.1 Maintenance of the IAP Database

A database of IAPs, which includes authorities, different spheres of government (national, provincial and local), parastatals, ward councillors, stakeholders, landowners, interest groups and members of the general public, was prepared for the project was maintained and updated as necessary during the course of the EIA Phase. Refer to **Appendix F**.

18.3.2 Comments and Responses Report

The EIA Comments and Responses Report provides a comprehensive summary of comments, issues and queries received from IAPs to date. This report also attempts to address the comments through input received from the project team.

All comments received following the public review of the Draft EIA Report are included in the updated Comments and Response Report (contained in **Appendix G4**).

18.3.3 Notification of Review of Draft EIA Report

In accordance with Regulation 43(1) of GN No. R 982 of 4 December 2014 (as amended), registered IAPs were granted an opportunity to review and comment on the Draft EIA Report.

IAPs were notified as follows of the opportunity to review the Draft EIA Report:

- Landowners, authorities and registered IAPs were notified via email and SMS, and a Reply Form was appended to the notification email (proof of notification is contained in **Appendix G1**).
- Notices were placed in the following newspapers (copies of the newspaper advertisements are contained in **Appendix G2**) -
 - The Polokwane Observer (local); and
 - The Capricorn Voice (regional).

18.3.4 Public Access to the Draft EIA Report

The review period for the Draft EIA Report took place from **07 November until 06 December 2019**. A copy of the document was placed at the following location:

1. Polokwane City Library: Hans Van Rensburg St, Polokwane, 0700 (015 290 2155).

The Draft EIA Report can also be accessed and downloaded from the following website:
<https://nemai.co.za/environmental/downloadable-documents/>

18.3.5 Copies of the Draft EIA Report to Authorities

Copies of the Draft EIA Report were provided to the following regulatory and commenting authorities (proof of deliveries is contained in **Appendix G3**):

- DEFF;
- DEFF Biodiversity and Conservation Unit;
- LDEDET;
- DWS Limpopo Regional Office;
- DAFF;
- LIHRA;
- SAHRA;
- Limpopo Department of Public Works, Roads and Infrastructure; and
- Capricorn DM and Polokwane LM.

18.3.6 Public and Authorities Meetings to Present the Draft EIA Report

A public and authority meeting has not been scheduled for the EIA Phase, however should one be requested by an IAP, then the details of the meeting will be communicated to all registered IAPs during the review period.

18.3.7 Comments Received on the Draft EIA Report

For remarks on the Draft EIA Report, the reviewer can complete a Comment Sheet, which is included in **Appendix J** (attached to the hardcopies of the Draft EIA Report). These completed Comment Sheets had to be forwarded to Nemai Consulting by **06 December 2019**.

In accordance with Regulation 44 of GN No. R. 982 of 4 December 2014 (as amended), the comments received from IAPs (including correspondence and completed Comment Sheets) from the review of the Draft EIA Report are contained in **Appendix G4**.

All comments received were incorporated into the updated Comments and Responses Report, contained in **Appendix G5**.

18.4 Notification of DEFF's Decision

Registered IAPs will be notified after having received written notice from DEFF (in terms of NEMA) on the final decision for the project. Advertisements will also be placed as notification of the Department's decision. The notification will also include the appeal procedure to the decision, as well as the key reasons for the decision.

19 EIA CONCLUSIONS AND RECOMMENDATIONS

19.1 Sensitive Environmental Features

The following sensitive environmental features and aspects that are associated with the project are highlighted for which mitigation measures are included in the EIA Report and appended EMPr:

- ❖ No watercourses will be directly impacted on by the project;
- ❖ Heritage sites as identified through the Heritage Impact Assessment, which are situated on site, are protected in terms of the NHRA and shall be suitably safeguarded;
- ❖ Several protected trees have distributions that fall within the study area. Of note, is the presence of *Sclerocarya birrea subsp. caffra* (Marula) recorded in abundance on site.
- ❖ One plant species of conservation importance were noted, namely *Boophone disticha* and this species has a conservation status of Declining.
- ❖ Should existing infrastructure and structures be affected by construction, these services will need to be safeguarded from construction activities until they have been relocated, where avoidance is not possible. This needs to take place in consultation with the owners or custodians of the infrastructure.
- ❖ Measures provided in the EMPr shall be implemented to safeguard all traffic and pedestrians on the public (Suid and Webster Street) and private roads surrounding the site.
- ❖ The safety and security of the public is of paramount importance and shall not be compromised by the activities associated with the construction and operational phases.
- ❖ Prevent construction-related nuisance to sensitive socio-economic receptors. The noise and air quality monitoring programmes need to take cognizance of these sensitive receptors, which include (amongst others) the properties and schools (Northern Academy Primary and Secondary School and New Horizon School) surrounding the proposed site.

Refer to **Figure 49** and **Appendix A** for the sensitivity map, which indicates the above-mentioned sensitive features on site, which were identified in the Scoping and EIA Process and by the specialist studies.

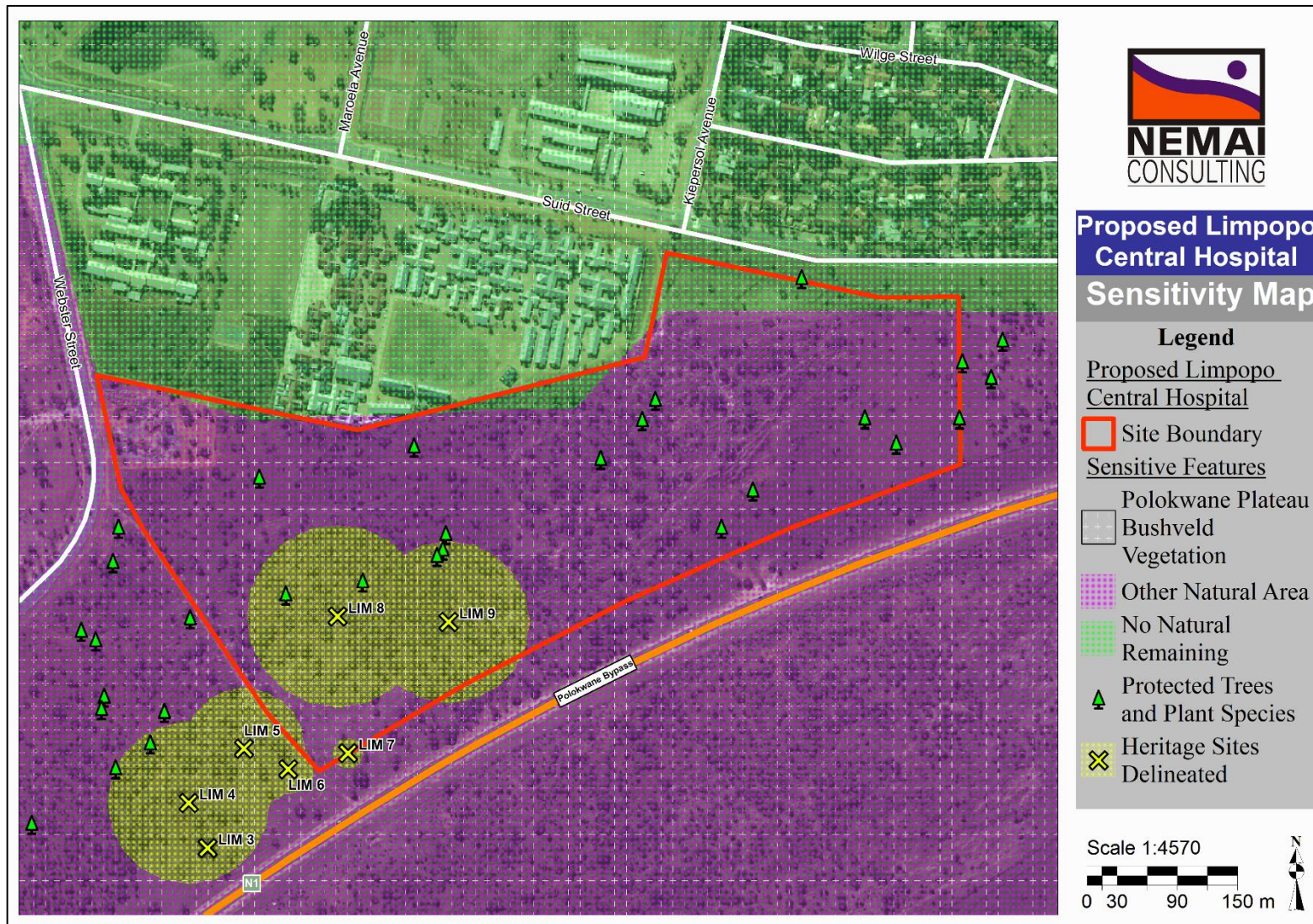


Figure 49: Sensitivity Map

19.2 Environmental Impact Statement

As part of the social infrastructure SIPs, SIP 12: Revitalisation of public hospitals and other health facilities, aims to build and refurbish hospitals, other public health facilities and revamp 122 nursing colleges. The SIP contains major builds for six hospitals, and extensive capital expenditure to prepare the public healthcare system to meet the requirements of the National Health Insurance (NHI) system. Major infrastructure projects under the health sector associated with this SIP include the construction of the proposed Limpopo Central Hospital.

The Limpopo Central Hospital Feasibility Report (Sakhiwo, 2018) indicated that public health infrastructure is a fundamental pillar to building a successful national health insurance programme. However, according to the National Service Delivery Agreement, the current public health infrastructure cannot adequately support the service delivery needs of the country. Health facility planning, including providing new hospitals and clinics and upgrading established facilities, needs to be expedited to increase citizen's access to a high standard of health care facilities. The fact that there is a significant shortage of skilled practitioners and health care workers in South Africa exacerbates the situation. Currently, the existing medical schools are unable to produce the requisite number of health professionals. If the country is to meet the requirements of the NHI goals of more equitable access to high-quality health services for all South Africans, both the academic component and health service provisioning must be improved.

The construction phase of the proposed new hospital in Polokwane, will create short term construction benefits to the receiving communities in the form of employment, skills and small business development. The hospital will have many operational benefits and will allow access to health care and address the need for scarce skills in the country. It will provide the opportunity to create an environment that would attract key teaching, academic and scarce professional staff. The construction and operation of the Limpopo Central Hospital is thus preferred over the "no-go" option.

Critical environmental activities that need to be executed during the project life-cycle include the following:

❖ Pre-construction Phase –

- Diligent compliance monitoring of the EMPr, Environmental Authorisation (if granted), and other relevant environmental legislation;
- Undertake a pre-construction survey of the project footprint by the relevant environmental specialists in order to identify sensitive environmental features;
- Develop a search, rescue and relocation plan for plant species of conservation concern found on site, namely the *Boophone disticha*.
- A permit from DAFF is required if protected trees as identified by the terrestrial ecological specialist, are to be cut, disturbed, damaged, destroyed or removed;

- If heritage resources are to be impacted on, a destruction permit must then be applied for. This application for destruction must be lodged with the SAHRA under section 35 of the NHRA. Upon issuing of the destruction permit construction can commence.
 - A condition survey of the local roads to be used during the construction phase should be made prior to construction.
 - Establish baseline parameters for dust fallout and noise.
 - Develop Environmental Monitoring Programme for dust fallout and noise.
 - On-going consultation with IAPs; and
 - Other activities as per the EMPr.
- ❖ Construction Phase –
- Diligent compliance monitoring of the EMPr, Environmental Authorisation (if granted), and other relevant environmental legislation;
 - Implement environmental monitoring programme (dust fallout and noise);
 - During the construction an archaeologist must monitor the site clearing as the possibility of encountering subsurface cultural and human remains are deemed to be high.
 - Reinstatement and rehabilitation of construction domain;
 - On-going consultation with IAPs; and
 - Other activities as per the EMPr.
- ❖ Operational Phase –
- Diligent compliance monitoring of the EMPr, Environmental Authorisation (if granted), and other relevant environmental legislation;
 - On-going consultation with IAPs;

With the selection of the BPEO, adoption of the mitigation measures included in this report and in the appended specialist studies, and the dedicated implementation of the EMPr, it is believed that the significant environmental aspects and impacts associated with this project can be suitably mitigated.

With the aforementioned in mind, it can be concluded that there are no fatal flaws associated with the project and that authorisation can be issued, based on the findings of the specialists and the impact assessment, and through the compliance with the identified environmental management provisions.

19.3 Recommendations

The following key recommendations, which may also influence the conditions of the Environmental Authorisation (where relevant), accompany the EIA Report for the proposed project:

1. Conduct pre-construction survey of entire footprint for sensitive environmental features. Survey team to include the following specialists –
 - a. Terrestrial ecologist; and

- b. Heritage specialist.
2. As discussed in the EMPr, various forms of monitoring is required to ensure that the receiving environment is suitably safeguarded against the identified potential impacts, and to ensure that the environmental management requirements are adequately implemented and adhered to during the execution of the project. The types of monitoring to be undertaken include –
 - a. Baseline Monitoring needs to be undertaken for dust fallout and noise to determine the pre-construction state of the receiving environment, and which will serve as a reference to measure the residual impacts of the project by evaluating the deviation from the baseline conditions and the associated significance of the adverse effects;
 - b. Environmental Monitoring for dust fallout and noise, which will entail checking, at pre-determined frequencies, whether thresholds and baseline values for certain environmental parameters are being exceeded; and
 - c. Compliance monitoring and auditing by the independent ECO against the EMPr and Environmental Authorisation.
3. Pertinent recommendations provided by the environmental specialists are provided below:
 - a. Terrestrial Ecological Impact Assessment (Nemai Consulting, 2019b) –
 - i. Several protected trees have distributions that fall within the study area. Of note, is the presence of *Sclerocarya birrea* subsp. *caffra* (Marula) recorded in abundance on site. This species is a nationally protected tree species, and the disturbance to which should be avoided where possible and in terms of Section 15(1) of the National Forests Act, 1998: *no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated.* A permit from Department of Agriculture, Forestry and Fisheries (DAFF) is required before construction commences in order to remove or disturb these protected trees identified on the study area.
 - ii. During the field survey, no threatened plant species were observed on site but only one species of conservation importance were noted, namely *Boophone disticha* and this species has a conservation status of *Declining*. It is thus recommended that the Search, Rescue and Relocation process should be conducted prior to construction activities taking place.
 - iii. Newly cleared soils will have to be re-vegetated and stabilised as soon as construction has been completed and there should be an on-going monitoring program to control and/or eradicate newly emerging invasives. The rehabilitation of disturbed areas should receive high priority and must be included in the EMPr and recommendations regarding the specific plant species used during rehabilitation should be site specific and according to the surrounding vegetation composition;

- iv. All development footprint areas should remain as small as possible and should not encroach onto surrounding areas; and
- b. Heritage Impact Assessment (PGS, 2019) –
 - i. The identified heritage sites are rated of having High/Medium Significance as well as being Generally Protected A (GP.A). Mitigation measures and permits are therefore required before they may be affected, moved or destroyed, thus the sites identified are considered as “no go” areas until further mitigation is implemented;
 - ii. A destruction permit must then be applied for with the backing of a mitigation report. This application for destruction must be lodged with the SAHRA under section 35 of the NHRA. Upon issuing of the destruction permit construction can commence.
 - iii. During the construction an archaeologist must monitor the site clearing as the possibility of encountering subsurface cultural and human remains are deemed to be high.
 - iv. A protocol for incidental palaeontological finds is required. This protocol should include the termination of all development work if any palaeontological finds are discovered on site, and SAHRA and a palaeontologist should be alerted to determine the way forward.
- c. Socio-Economic Impact Assessment (Nemai Consulting, 2019a) –
 - i. The socio-economic impact assessment has identified the need for relocation of three or four homeless dwellers occupying the proposed site, and recommended that the inhabitants should be relocated with due regard to the law and their particular circumstances.
 - ii. Construction and other materials to be sourced from local suppliers to boost the regional economic and drive the creation of more sustainable jobs.
 - iii. SMME opportunities should be provided to everyone on an equal basis. Where possible, NDoH should support and encourage the development of SMMEs and local or regional suppliers.
 - iv. Where possible, procurement should come from local and regional business so that the profits stay in the area, increasing economic activity.
- d. Agricultural Impact Assessment (Terra Soil Science, 2019) –
 - i. The site must be incorporated into the urban development zone in order to relieve pressure on areas lying further out of the urban fringe in terms of urban expansion pressures.

20 OATH OF THE EAP AND DECLARATION OF INDEPENDENCE

I (name and surname) Christian van der Hoven
At (address) 147 Bram Fischer Drive, Ferndale
ID No. 9309155161082

I hereby make an oath and state that:

In accordance with Appendix 3(1)(s) of Government Notice No. R. 982 of the 2014 Environmental Impact Assessment (EIA) Regulations (as amended on 07 April 2017), this serves as an affirmation by the Environmental Assessment Practitioner (EAP) in relation to:

Section 3(1)(s)

- i. The correctness of the information provided in this report;
- ii. The inclusion of comments and inputs from stakeholders and interested and affected parties (IAPs);
- iii. The inclusion of inputs and recommendations from the Specialist Reports where relevant; and
- iv. Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.

1. I know and understand the contents of this declaration. Yes

2. I do not have any objection in taking prescribed oath. NO

3. I consider the prescribed oath to be binding on my conscience. Yes

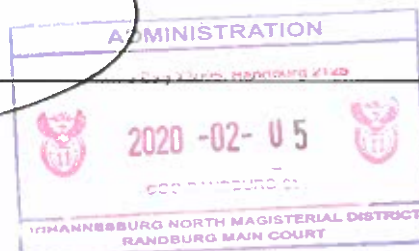
Signature [Signature] Date: 05-02-2020

I certify that the deponent has acknowledged that he/she knows and understands the contents of the statement and the deponent signature was placed there on in my presence.

[Signature]
Commissioner of Oath

Arntjie Maritz
Full name

Senior
Designation



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