September 2009
Scoping Phase

Kusile Railway Project: Proposed construction of a railway line (and associated infrastructure) from the existing railway (parallel to the N4) to the Kusile Power Station

DEA REF NO: 12/12/20/1488

Proponent: Eskom Generation

FINAL SCOPING REPORT

Project: 12202

ZITHOLELE CONSULTING

PURPOSE OF THIS DOCUMENT

Eskom is responsible for the generation, transmission and distribution of electricity in South Africa. It supplies approximately 95 % of the country's electricity and 60 % of the total electricity consumed on the African continent. Current shortages in power supply in the country have necessitated the construction of new power stations, of which the Kusile power station is one.

The Kusile power station, and its infrastructure, including rail and road transportation, received Environmental Authorisation (EA) in March 2008. According to the original planning, sorbent would only be transported by rail to the power station while the roads network would be used for other transportation. However, during the detailed design of the infrastructure, the authorised rail route was deemed not feasible due to some technical challenges. The planning process also showed that the rail construction and operation would not be ready when the first generation unit comes into operation thus necessitating an alternative sorbent transportation mechanism. Road transportation was deemed an appropriate *temporary* alternative until the railway is operational.

One of the conditions of the EA (March 2008) for the construction of Kusile power station was that it must be fitted with the most advanced air pollution reducing equipment ever installed at a power station in South Africa (Flue Gas Desulphurisation [FGD]). This technology would result in a minimum of 90% of the sulphur dioxide (SO_2) being removed from the power station emissions, bringing it in line with international emission standards.

Alkaline sorbents (materials used to adsorb either liquids or gases) are used for scrubbing flue gases to remove the SO_2. Lime is used on large coal or oil fired boilers as found in power plants, as it is less expensive than sodium hydroxide. Therefore, a sorbent is required to reduce the amount of SO_2 that is emitted. The SO_2 reacts with the calcium in the limestone to form calcium sulphate ($CaSO_4$) or calcium sulphite ($CaSO_3$) and CO_2. The source of sorbent would be determined through a commercial process.

Eskom Generation has appointed Zitholele Consulting (Pty) Ltd, an independent company, to conduct an Environmental Impact Assessment (EIA) to evaluate the potential environmental and social impacts of the proposed project. The Environmental Assessment Practitioner (EAP) is Mrs Jacqui Hex.

The first phase of an EIA is the Scoping Phase. This is the phase during which public issues, concerns and suggestions are identified so that they can be evaluated by the EIA technical specialists during the next phase (the Impact Assessment Phase) of the EIA.

According to the EIA Regulations, Interested and Affected Parties (I&APs) must have the opportunity to comment on the proposed project and verify that all the issues raised during the Scoping Phase have been recorded. This was the main purpose of the Draft Scoping Report (DSR), which was available for comment for the period 27 July to 27 August 2009. Comments received have been considered in this Final Scoping Report (FSR) which is being submitted to the lead authority, the National Department of Environmental Affairs (DEA) for approval to proceed with the EIA.

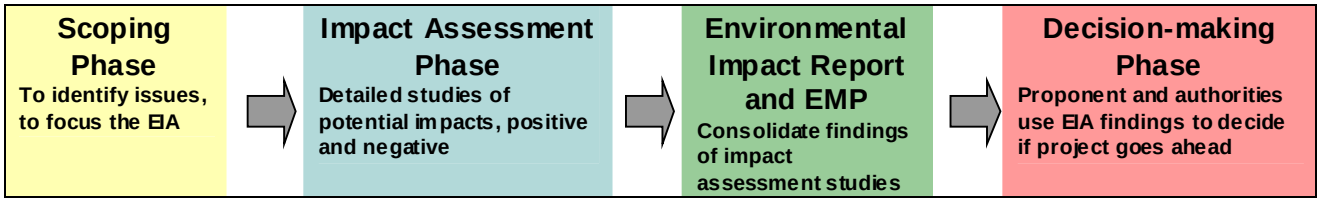
I&APs will also have an opportunity to comment on the findings of the EIA, which will be presented in a Draft Environmental Impact Report (DEIR). After public review, the DEIR will be updated and submitted to the DEA for a decision about the project.

Summary of what the Final Scoping Report Contains

This report contains the following for comment by stakeholders:

- The background and description to the proposed project, including alternatives
- An overview of the EIA process, including the public participation process
- A description of the existing environment in the project area
- The potential environmental issues and impacts which have already been identified
- The terms of reference for the specialist studies
- A list of comments raised and responses to date (Issues Trail Report)

AN EIA CONSISTS OF SEVERAL PHASES



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ABBREVIATIONS

$CaSO_3$.....Calcium Sulphite
$CaSO_4$.....Calcium Sulphate
CO_2.....Carbon Dioxide
DC.....Direct Current
DEIR.....Draft Environmental Impact Report
DM.....Department of Minerals
DSR.....Draft Scoping Report
DEA.....Department of Environmental Affairs
DWA.....Department of Water Affairs
DWEA.....Department of Water and Environmental Affairs
EA.....Environmental Authorisation
EAP.....Environmental Assessment Practitioner
ECA.....Environment Conservation Act
EIA.....Environmental Impact Assessment
FEIR.....Final Environmental Impact Report
FGD.....Flue Gas Desulphurisation
FSR.....Final Scoping Report
GNR.....Government Notice Regulation
HDI.....Historically Disadvantaged Individuals
I&APs.....Interested and Affected Parties
IEM.....Integrated Environmental Management
IEP.....Integrated Energy Plan
ISEP.....Integrated Strategic Electricity Planning
kV.....Kilo Volts
MVA.....Mega Volt Ampere
NEMA.....National Environmental Management Act
NERSA.....National Energy Regulator of South Africa
NIRP.....National Integrated Resource Plan
OHTE.....Overhead Traction Equipment
SIA.....Social Impact Assessment
SO_2.....Sulphur Dioxide
TFR.....Transnet Freight Rail
ToR.....Terms of Reference

1 INTRODUCTION

1.1 Who is the proponent?

Eskom Holdings (Ltd) is the South African utility that generates, transmits and distributes electricity. Eskom supplies ~95% of the country's electricity, and ~60% of the total electricity consumed on the African continent. Eskom play a major role in accelerating growth in the South African economy by providing a high-quality supply of electricity.

1.2 Increased Electricity Supply Plan

For many years Eskom has operated in an environment of surplus capacity, this situation has changed in the past few years due to the resulting in an insufficient reserve margin.

The decision to expand Eskom's electricity capacity was based on national policy and informed by on-going strategic planning undertaken by the National Department of Minerals (DM), the National Energy Regulator of South Africa (NERSA) and Eskom. Through Eskom's electricity long term planning process, the Integrated Strategic Electricity Planning (ISEP) process, Eskom identified long-term options for the supply and demand sides of electricity provision in South Africa.

The latest ISEP (ISEP 11, 2008) has identified the need for increased base load electricity supply by the year 2014, while peaking generation is being attended to in the shorter term. The NERSA is the regulatory authority responsible for the electricity supply industry in South Africa. In its National Integrated Resource Plan (NIRP), NERSA has determined that, while various alternative and renewable electricity generation options should be continually investigated, coal would still provide the main fuel source in South Africa. Accordingly, coal-fired power stations will be required for the expansion of generation capacity during the next 20 years.

On 29 February 2008 Eskom awarded contracts for the construction of the Kusile power station. This coal-fired power station is located near Emalahleni in Mpumalanga. The first unit is planned to be commissioned by 2013.

1.3 Kusile Railway and Associated Infrastructure Project

The planning and decision of Kusile power station included Flue Gas Desulphurisation (FGD), technology which will reduce the sulphur dioxide (SO_2) emissions by 90%. This will bring the emissions in line with international emission standards.

Alkaline sorbents are used in the FGD for scrubbing flue gases to remove the SO_2. While the exact source of the sorbent has not been finalised, and contracted, the required sorbent will be transported from a source to be identified through a commercial process.

According to the original planning, sorbent would only be transported by rail to the power station while the roads network would be used for transportation of construction equipment. A rail route was

studied and authorised in the Environmental Impact Assessment (EIA) for Kusile however, during the detailed design of the railway line, the authorised route was deemed not feasible due to some technical challenges. In terms of the regulations the changes in the route were sufficient to require another EIA.

The current planning process also suggests a risk that the rail construction and operation would not be ready when the first two generation units come into operation, thus necessitating an alternative sorbent transportation mechanism. Road transportation was deemed an appropriate temporary alternative until the railway is operational, especially since Eskom has embarked on a major drive to reduce road transportation of its supplies. This drive is seen to provide the benefit of decreasing road transportation accidents, thus improving safety. The proposed road for the temporary sorbent transportation, as mentioned, was included and approved in the initial Kusile power station EIA and as such has received EA and construction has commenced. Thus this study will not consider any road transportation.

The railway line to be assessed in this project will be used to connect the existing Pretoria-Witbank rail route along the Pretoria-Witbank N4 highway to the Kusile power station.

1.4 Context of This Report

This report is the Final Scoping Report (FSR), a key component of the environmental authorisation process for the proposed construction of a railway line from the existing Pretoria-Witbank railway line, north of the N4 highway, to the Kusile power station for the transportation of sorbent.

1.5 Environmental Impact Assessment Practitioner (EAP) Details

In terms of the NEMA EIA regulations, the proponent must appoint an EAP to undertake the environmental assessment of an activity regulated in terms of the aforementioned Act. In this regard, Eskom appointed Zitholele Consulting to undertake the EIA for the proposed construction of the Kusile railway line and associated infrastructure, in accordance with the EIA Regulations promulgated in April 2006 in terms of the National Environmental Management Act ([NEMA] No 107 of 1998) which became effective on 1 July 2006.

Zitholele Consulting is an empowerment company formed to provide specialist consulting services primarily to the public sector in the fields of Water Engineering, Integrated Water Resource Management, Environmental and Waste Services, Communication (public participation and awareness creation) and Livelihoods and Economic Development.

Zitholele Consulting has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations.

The details of the EAP representative are listed below.

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Company Represented:	Zitholele Consulting (Pty) Ltd.

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Jacqui Hex, MSc (Env. Man.) (cum laude), BSc Hons (Geog), BSc Natural & Environmental Sciences

Mrs. Jacqui Hex joined Zitholele Consulting (Pty) Ltd in the January 2007 as an environmental scientist. She forms part of the Environment and Waste management sector of the Environment and Waste division of the company. She was awarded the top masters student award at the University of Johannesburg in 2006. She has also attended a course on Environmental Auditing, Environmental Impact Assessments and International Association in Public Participation. She has an in depth knowledge on EIA's, environmental law, strategic environmental assessment, integrated environmental management, social impact assessments, environmental auditing, environmental economics, environmental management frameworks and waste management. A curriculum vitae of the EAP is provided in Appendix A.

1.6 Objectives of the Scoping Report

This report addresses the requirements for Scoping and the Plan of Study (PoS) for the EIA as outlined in the NEMA regulations. The aim of this Final Scoping Report (FSR) is to:

- Provide information to the authorities as well as interested and affected parties on the proposed project;
- Provide information regarding alternatives that have been considered;
- Indicate how interested and affected parties have been and are still being afforded the opportunity to contribute to the project, verify that the issues they raised to date have been considered, and comment on the findings of the impact assessments;
- Describe the baseline receiving environment;
- Define the Terms of Reference (ToR) for specialist studies to be undertaken in the Impact Assessment Phase of the EIA; and
- Present the findings of the Scoping Phase in a manner that facilitates decision-making by the relevant authorities

2 LEGAL REQUIREMENTS

Environmental legislation in South Africa was promulgated with the aim of, at the very least, minimising and at the most preventing environmental degradation. The following Acts and Regulations are applicable to the Kusile Railway Project:

2.1 The Constitution of the Republic of South Africa (Act 108 of 1996)

Section 24 of the Constitution states that: Everyone has the right

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-

- prevent pollution and ecological degradation;
- promote conservation; and
- secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development

The current environmental laws in South Africa concentrate on protecting, promoting, and fulfilling the Nation's social, economic and environmental rights; while encouraging public participation, implementing cultural and traditional knowledge and benefiting previously disadvantaged communities.

2.2 National Environmental Management Act (No 107 of 1998)

The EIA for this proposed project will be conducted in terms of the EIA Regulations that were promulgated in terms of Section 24 (5) of the NEMA. The National Department Environmental Affairs (DEA) is the competent authority responsible for issuing environmental authorisation for the proposed project. The Gauteng Department of Agriculture Conservation and Environment (GDACE) and the Mpumalanga Department of Agriculture and Land Administration (MDALA) are key commenting authorities.

2.2.1 Environmental Impact Assessment Regulations: 385 -387 of 21 April 2006

A full EIA is applicable to all projects likely to have significant environmental impacts due to their nature or extent, activities associated with potentially high levels of environmental degradation, or activities for which the impacts cannot be easily predicted. In comparison a Basic Assessment is required for projects with less significant impacts or impacts that can easily be mitigated. The difference between the processes relates to the nature of the proposed development in terms of its potential impact on the environment, and this is reflected in the level of detail that information is collected in as well as the level of interaction with I&APs.

In terms of Government Notice Regulation (GNR) 387, activity 1(s), a full Environmental Impact Assessment comprising both Scoping and Impact Assessment, is necessary for the proposed construction of a railway line. This main activity is listed as follows:

Activity 1(s): The construction of facilities and infrastructure, including structures or infrastructure for rail transportation, including the following:

- {i} Railway lines;
- {ii} Stations;
- {iii} Shunting yards.

Additional activities that are being applied for under Regulation GNR 387 are listed below:

Activity 1(c) The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 1 000 m^3 (1 000 000 lt or 1 Mlt) at any one location, including the storage of one or more dangerous goods in a tank farm.

Activity 1(e) Any process or activity which requires a permit or licence in terms of legislation governing the generation or release of emissions, pollution, effluent or waste which is not identified in Government Notice No. R. 386 of 2006.

Activity 1(l) The transmission and distribution of above ground electricity with a capacity of 120 kV or more.

Activity 2 Any development activity, including associated structures, where the total area of the development is, or is intended to be, 20 ha or more.

Activity 10 Any process or activity identified in terms of section 53(1) of the NEM: Biodiversity Act, 2004

The following activities in accordance with Regulation GNR 386 (Basic Assessment activities) are also included in the EIA application, to provide for supporting infrastructure associated with the proposed construction of the railway line:

Activity 1 (m) Activities within the 1:10 flood line. The construction of facilities for any purpose in the 1:10 flood line of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including:

{iii} canals, channels, bridges, dams, weirs

Activity 1 (p) Facilities for the temporary storage of hazardous waste

Activity 1 (s) The treatment of effluent, wastewater or sewage with an annual throughput capacity greater than 2 000 m^3 but less than 15 000 m^3

Activity 4 The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 m^3 from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland.

Activity 7 The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 m^3 (300 000 lt) but less then 1 000 m^3 (1 Mlt) at any one location or site.

Activity 13 The abstraction of groundwater at a volume where any general authorisation issued in terms of the National Water Act, 1998 (Act 46 of 1998) will be exceeded.

Activity 14 The construction of masts of any material or type and of any height, including those used for telecommunication broadcasting and radio transmission, but excluding – Masts of 15 metres and lower exclusively used

{i} By radio amateurs; or

{ii} For lighting purposes

{iii} Flag poles; and

{iv} Lightning conductor poles.

Activity 15 The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long

Activity 16 (a) The transformation of undeveloped, vacant or derelict land to establish infill development covering an area of 5 ha or more, but less than 20 ha.

(b) The transformation of undeveloped, vacant or derelict land to residential, mixed, retail, commercial, industrial or institutional use where such development does not constitute infill where the total area to be transformed is bigger than 1ha (10 000 m^2)

Activity 20 The transformation of any areas/zones for use as public open space or for a conservation purpose to another use.

Since the project comprises activities that require both a Basic Assessment and EIA levels of investigation, all activities will be assessed to the detail required for a full EIA process.

The NEMA can be regarded as the most important piece of general environmental legislation. It provides a framework for environmental law reform and covers three areas, namely:

- Land, planning and development;
- Natural and cultural resources, use and conservation; and
- Pollution control and waste management.

The law is based on the concept of sustainable development. The objective of the NEMA is to provide for co-operative environmental governance through a series of principles relating to:

- The procedures for state decision-making on the environment; and
- The institutions of state which make those decisions.

The NEMA principles serve as:

- A general framework for environmental planning;
- Guidelines according to which the state must exercise its environmental functions; and
- A guide to the interpretation of NEMA itself and of any other law relating to the environment.

2.2.2 What are the NEMA principles?

Some of the most important principles contained in NEMA are that:

- Environmental management must put people and their needs first;
- Development must be socially, environmentally and economically sustainable;
- There should be equal access to environmental resources, benefits and services to meet basic human needs;
- Government should promote public participation when making decisions about the environment;
- Communities must be given environmental education;
- Workers have the right to refuse to do work that is harmful to their health or to the environment;
- Decisions must be taken in an open and transparent manner and there must be access to information;
- The role of youth and women in environmental management must be recognised;
- The person or company who pollutes the environment must pay to clean it up;
- The environment is held in trust by the state for the benefit of all South Africans; and
- The utmost caution should be used when permission for new developments is granted.

2.3 Environment Conservation Act (Act No 73 of 1989)

The Environment Conservation Act (ECA) is a law that relates specifically to the environment. Although most of this Act has been replaced by the NEMA there are still some important sections that remain in operation. These sections relate to:

- Protected natural environments;
- Littering;
- Special nature reserves;
- Waste management;
- Limited development areas;
- Regulations on noise, vibration and shock; and
- EIA.

2.4 Additional Acts and Frameworks

In addition to the ECA and NEMA, the following Acts have some bearing on the proposed activities:

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

The proposed construction of the railway line comprise certain activities (e.g. changing the nature of a site exceeding 5 000 m^2 and linear developments in excess of 300 m) that require authorisation in terms of Section 38 (1) of the Act. Section 38 (8) of the Act states that, if heritage considerations are taken into account as part of an application process undertaken in terms of the ECA, there is no need to undertake a separate application in terms of the National Heritage Resources Act. The requirements of the National Heritage Resources Act have thus been addressed as an element of the EIA process, specifically by the inclusion of a Heritage Assessment.

Expropriation Act (No. 63 of 1975)

Eskom has a policy of "willing buyer, willing seller", and therefore endeavours to purchase land where ever possible or necessary. However, the State and State-owned-enterprises can acquire the rights to use or possess the requisite land through the Expropriation Act (No 63 of 1975). The Expropriation Act requires the determination of compensation based on the principle of market value (i.e. what would the value be in the event of both a willing buyer and a willing seller trading the land). There is a suite of additional legislation, which, in conjunction with the Expropriation Act, would be used to determine the compensation value.

Occupational Health and Safety Act (Act No 85 of 1993)

This Act makes provisions that address the health and safety of persons working at the proposed plant and railway. The Act addresses amongst others the:

- Safety requirements for the operation of plant machinery;
- Protection of persons other than persons at work against hazards to health and safety, arising out of or in connection with the activities of persons at work;
- Establishment of an advisory council for occupational health and safety; and
- Provision for matters connected therewith.

The law states that any person undertaking upgrades or developments for use at work or on any premises shall ensure as far as is reasonably practicable that nothing about the manner in which it is erected or installed makes it unsafe or creates a risk to health when properly used.

National Railway Safety Regulator Act (Act No 16 of 2002)

The Act makes provisions to provide for:

- The establishment of a Railway Safety Regulator;
- Its objects and functions and for the manner in which it is to be managed;
- Its staff matters: to provide for safety standards and regulatory practice for the protection of persons, property and the environment; and
- Matters connected therewith.

Department of Environmental Affairs and Tourism Integrated Environmental Management Information Series

The Department of Environmental Affairs (DEA) Information Series of 2002 and 2006 comprise 23 information documents. The documents were drafted as sources of information about concepts and approaches to Integrated Environmental Management (IEM). The IEM is a key instrument of NEMA and provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. The aim of the information series is to provide general guidance on techniques, tools and processes for environmental assessment and management.

2.5 Eskom Planning Processes

The following section, although not legislative, provide supplementary information on some of Eskom's planning processes.

Integrated Energy Plan (IEP) – 2003

The DM commissioned the IEP to provide a framework in which specific energy policies, development decisions and energy supply trade-offs can be made on a project-by-project basis. The framework is intended to create a balance in providing low cost electricity for social and economic development, ensuring security of supply and minimizing the associated environmental impacts. The

IEP projected that the additional demand in electricity would necessitate an increase in electricity generation capacity in South Africa by 2007. Furthermore, the IEP concluded that, based on energy resources available in South Africa, coal will be the primary fuel source for the current expansion period.

National Integrated Resource Plan (NIRP) – 2003/2004

In response to the White Paper's objective relating to affordable energy services, the National Electricity Regulator (now NERSA) commissioned a NIRP. The objectives of the NIRP are to determine the least-cost supply option for the country, provide information on the opportunities for investment into new power stations and evaluate the security of supply.

The national electricity demand forecast took a number of factors into account. They are:

- A 2.8% average annual economic growth;
- The development and expansion of a number of large energy-intensive industrial projects;
- Electrification needs;
- A reduction in electricity-intensive industries over the 20 year planning horizon;
- A reduction in electricity consumers – NIRP anticipates people switching to the direct use of natural gas;
- The supply of electricity to large mining and industrial projects in Namibia and Mozambique; and
- Typical demand profiles.

White Paper on the Energy Policy of the Republic of South Africa – 1998

Development within the energy sector in South Africa is guided by the White Paper on the Energy Policy, published by the Department of Minerals (DM) in 1998. This White Paper sets out five objectives for the further development of the energy sector. The five objectives are as follows:

- Increased access to affordable energy services;
- Improved energy governance;
- Stimulating economic development;
- Managing energy-related environmental and health impacts; and
- Securing supply through diversity.

Furthermore, the Energy Policy identified the need to undertake an Integrated Energy Planning (IEP) process in order to achieve a balance between energy demand and resource availability, whilst taking into account health, safety and environmental aspects. In addition, the policy identified the need for the adoption of a National Integrated Resource Planning (NIRP) approach to provide a long-term cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social and economic policies.

3 PROJECT DESCRIPTION AND ALTERNATIVES CONSIDERED

3.1 Project Description

The proposed project is for the construction of a railway line and associated infrastructure from the Kusile power station to the existing railway line north of the N4. The railway as well as its' infrastructure are briefly described below.

3.1.1 Proposed Railway Line

The following components of the railway design were taken into consideration:

- Length of the railway;
- Railway layout for the unloading facility;
- Frequency of trains;
- Formation design;
- Track design;
- Signalling design;
- Electrical design; and
- Communication design.

Route Length

The length of the proposed rail line will range between 10 and 20 km depending on the alternative selected.

Rail Layout for Unloading Facility

The sorbent rail yard will be designed for 50 wagon trains hauled by six locomotives. The layout will include unloading options by means of a bottom discharge wagon (Figure 3-1). The offloading yard will be located next to the power station for the shortest practical conveyor route to the sorbent stockpile. Two loops will be provided on each side of the unloading point to allow a set of 50 loaded wagons to be placed, and a set of 50 empty wagons unloaded in a previous operation to be removed. The sorbent yard length is approximately three kilometres in length. Provision has been made for two spur lines to allow for six locomotives as well as defective wagons to be staged temporarily.

Figure 3-1: Example of a Bottom Discharge Wagon.

Frequency of Trains

It is envisioned that one train will enter the siding and one train will exit the siding on a daily basis (total of two trains per day).The exact times of travelling of the wagons will be informed by consultations and engagements with the Transnet Freight Rail (TFR), who will be operating the rail.

Formation Design

The formation design approach for this project will be based on the following engineering principles:

- To optimise the use of in-situ materials;
- To ensure proper horizontal and vertical alignment;
- To ensure drainage designs conforming to the required standards with special attention given to cross drainage;
- To provide an appropriate formation structure for a 25-year design life; and
- To ensure that the proposed design of the formation is economical and cost effective in terms of construction and subsequent maintenance.

Track Design

The track design will allow for an axle load of 20 ton and it will be to class N2 standard. The minimum radius of curves on the line will be 500 m. This is to ensure that the new proposed railway line's track design is in accordance with the existing track design of the Transnet Freight Rail (TFR) line from which it takes off.

Figure 3-2: Example of the track design.

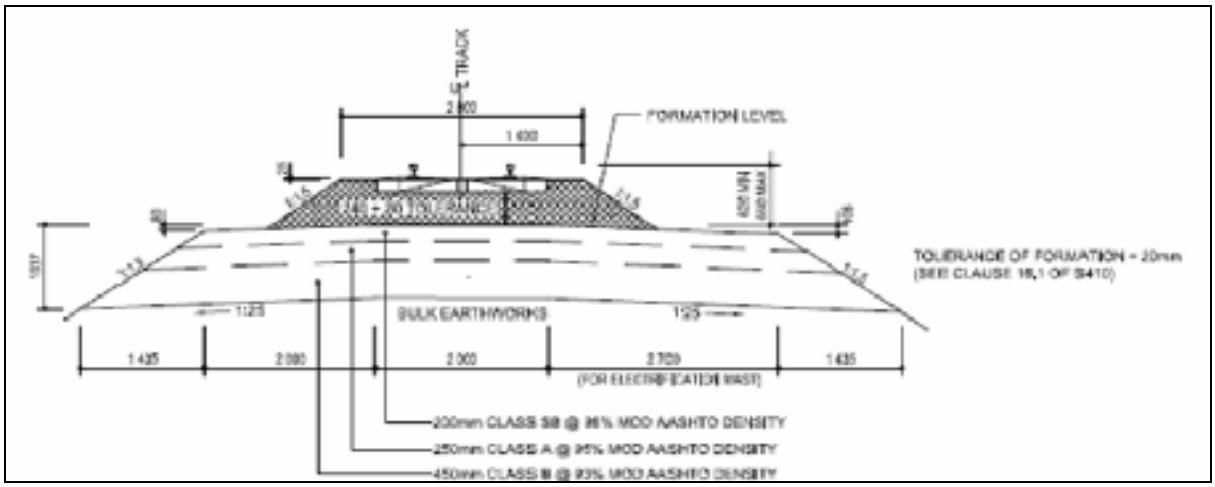


Figure 3-3: Typical cross section of formation and track design.

Signalling Design

The signalling design will be done to interface with the existing TFR signalling system and enable TFR to operate it as a part of the centralised train control system. The rail connection will require an additional relay room (Figure 3-4 and Figure 3-5) and the associated changes to the existing control panels.

Figure 3-4: Example of the proposed relay room.


Figure 3-5: Example of the contents of a relay room.

Electrical Designs

The electrical substation and overhead traction design will be done to the latest prevailing standards. It will make use of auto-tensioning devices on the overhead traction equipment (OHTE) and will be able to cater for 50 wagon trains with an axle load of 20 ton (Figure 3-6).

The OHTE system voltage will be 3.3 kV DC. The OHTE system will be fed by one or two 4.5 MVA or 6 MVA substations (Figure 3-7). The preliminary design will determine whether two substations will be required in the siding. The substations will be constructed next to the rail line. Eskom power lines will be required to link these substations with the existing Eskom transmission network. The positions of these lines are dependant on the position of the traction substations.

At least one substation is required and will be located adjacent to the approved railway line. The location of the substation will be based on an area with the least environmental impacts and preferably near to an existing Eskom transmission or distribution line from which it can be fed.

Figure 3-6: Example of the proposed OHTE.

Communications Design

The communication design will be done to interface with the communication system of TFR in order to operate the line as part of their network. The communication will allow for remote control of signalling equipment. Remote control of substations and communication between trains and the centralised traffic control centre.

The existing TFR railway between Greenview and Witbank Stations has a limitation of 50 wagon trains. The approach is to design the connection to the northern TFR rail line in such a way to allow the eastern and western approaching trains on the TFR rail line to enter the siding without delay. This can be done if the signalling of the siding is integrated and controlled by TFR.

The communication system will not be visible and have minimal to no impact. The only visible item will be the optic fibre cable approximately 8 mm in diameter along the OHTE.

Geometric Design Standards

The line will be designed for 20 ton per axle loads at a maximum gradient of 1% (1:100) and in accordance with the following design documents:

- SANS 3000-1 Standards (Appendix J); and
- Standard Guidelines for the construction of rail lines.

The design criteria are outline in Table 3-1 below.

Table 3-1: Design criteria for the alignment and sorbent yard (unloading).

PARAMETER	DESIRABLE
ALIGNMENT	
Design speed	70 km/h
Minimum radius	500 m
Design speed for super elevation	70 km/h
Minimum gradient	1.0%
Minimum rail reserve width (including service road)	±31 m depending on cut and fill heights
SORBENT YARD	
Design speed	30 km/h
Minimum radius	400 m
Design gradient	1:800 min
Minimum rail reserve width	22.3 m

3.1.2 Proposed Associated Infrastructure

The following associated infrastructure is envisioned for the proposed railway.

Substation

As mentioned in Section 3.1.1 it is proposed to construct a substation adjacent to the railway track. Depending on the length of the railway either one or two substations will be constructed. The footprint of the substation will be approximately 65 by 30 metres (Figure 3-7).

Figure 3-7: Example of the proposed substation to be constructed for the railway.

Rail Yard and Unloading Facility

The rail yard and unloading facility will be located in the footprint of the Kusile Power Station land on Eskom property.

132 kV Power Lines

In order for the railway to be electrified a 132 kV or 88 kV power line is required to provide electricity. An example of such a low voltage power line is provided below (Figure 3-8).

Figure 3-8: Example of a low voltage distribution power line.

Access Roads and Fencing

The proposed maintenance / access road will be within the railway servitude (Figure 3-9). The access road will run parallel to the railway line, as far as possible. It is envisioned that the access road and railway servitude will be fenced off for safety and security reasons, with appropriate fencing.

Figure 3-9: Example of an access road.

Communication Masts

A communication mast(s) may be required in order for the train driver to receive signalling directions, and to allow other necessary communication.

Bridges

Where the railway crosses a stream or road the following structures may be required to be constructed:

- Culverts: Crossing streams or providing for storm water runoff ;
- Road over rail bridges: Crossing under roads;
- Rail over road bridges: Crossing over roads;
- Rail over stream bridges: Crossing streams.

Cattle crossings under / over rail structures may also be constructed, if deemed necessary, allowing for livestock to cross the rail track safely.

3.1.3 Construction area

The rail reserve width (single line) is ±31 m, depending on cut and fill heights. Construction activities will be limited to the width of the servitude in which the rail will be constructed.

3.1.4 Major Activities of the Overall Project

The major activities for the proposed project (including the EIA), prior to and after construction, are explained in the table below.

Table 3-2: Major activities for the proposed project.

NO	ACTIVITY	DETAILS
	PRECONSTRUCTION PHASE	

1	Screening	Prior to the undertaking of an EIA a technical team devised six railway route alternatives for the proposed project. An environmental team was commissioned to undertake a screening exercise in the area to determine the top three most feasible alternatives from an environmental perspective to take into the EIA.
2	EIA	An EIA is being undertaken to ensure that all environmental, social and cultural impacts are identified and to ensure that stakeholders have the opportunity to raise issues and concerns. This is necessary to obtain Environmental Authorisation from the competent authority in this case the Department of Environmental Affairs (DEA);
3	Consultation with private property owners and registration of servitudes	All stakeholders and property owners will be engaged in the EIA however Eskom will have to begin with land negotiations in order to purchase servitudes.
4	Structure foundation investigation	Investigations will be undertaken to ensure that the foundation specifications are in line with the underlying geology.
5	Approval from road, rail and water authorities	
6	Relocation of services	If any infrastructure needs to be relocated for the development it must be undertaken prior to commencement with construction.
CONSTRUCTION PHASE		
1	Structures	**Fencing** - Provide a safe and secured rail transport area to restrict access and prevent injuries to livestock.
		Formation - Provide a ground formation compacted to the correct standard and alignment on which to build the railway track. The formation can be in a cutting or in the form of an embankment. The slope on either side of the formation will suit soil conditions, usually in the order of 1:1.5. Slopes determine the width of the formation and thus the width of the servitude. The servitude will be fenced in and may be up to 40 m wide in extreme cases but 20m wide normally.
		Drainage - Provide water drainage channels along and the track and within the servitude to provide for the maintenance of the line and its components.
		Bridge Structures - Provide structures at road or stream crossings, or for moving livestock, that may be classified as: • Culverts: Crossing streams and or providing for storm water runoff; • Road over rail bridges: Crossing under roads; • Rail over road bridges: Crossing over roads; or • Rail over stream bridges: Crossing streams. Cattle crossings under / over rail structures: Allowing for livestock to cross the rail track safely.
		Perway - Provide the railway track (permanent way) consisting of: • Ballast: Stone acting as a flexible support under the sleepers; • Sleepers: Supporting the rails; and • Rails: The rails carrying a train (will be 48 kg/m rails or heavier) Turnouts: Installations in a track that guide a train from one line to another.
2	Construct Overhead Traction Equipment	The OHTE will be constructed to provide electricity to the locomotives via the pantographs mounted on top of the locomotives. The OHTE provides a transmission line along the route transferring continuous power through the contact wire to the pantographs of a train passing underneath the OHTE.

3	Design and Construct 3kV DC traction substations	These substations are required along the rail route to transform 3 phase 88 kV or 132 kV electricity from Eskom to 3kV DC feeding the OHTE. The substations, normally spaced 10 km apart, are placed on a suitable site next to the track. The typical size of such a substation site is 65m x 30m.
4	Construct bulk power supply transmission or distribution lines to traction substations (Eskom)	These transmission lines are required to feed the traction substations from the Eskom supply. They can typically be 88 kV or 132 kV, three phase which are standard Eskom voltages.
5	Design and construct signalling and rail bound communication system	A signalling system is required to control trains in order to maintain safe following distances and to avoid head-on collisions. The signal system is specifically required at the take off point of the line where it connects with Transnet Freight Rail system near Wilge River station. Signals in the form of colour lights mounted on poles will be provided next to the track where required.
REHABILITATION PHASE		
1	Rehabilitate the construction area	The area where construction has taken place must be rehabilitated to minimise environmental degradation by following the Environmental Management Plan that is compiled in conjunction to the EIA.
OPERATIONAL PHASE		
1	Commencement of operations	Rehabilitation tasks may take place either after or progressively during construction once the tasks have been completed the transportation of sorbent to the power station may commence.
DECOMMISSIONING AND CLOSURE PHASE		
1	Decommissioning of the railway and its infrastructure	Once the railway line is no longer in use and is no longer required a decommissioning process may commence.

3.1.5 Overall Project Schedule

The primary milestones for the Kusile rail line project (prior and through to post construction) are described in Table 3-3 below.

Table 3-3: Primary milestones of the Kusile Rail Line.

MILESTONES	DATE
Final Scoping Report	September 2009
Undertake Specialist Studies	September / October 2009
Draft EIR and EMP	October 2009
Stakeholder Engagement on EIR / EMP	November 2009
Finalise EIR and EMP	January 2010
Submission to Relevant Authorities	January 2010
Environmental Authorisation	April 2010
Appeal Period	To be confirmed after the Environmental Authorisation
Construction (including EMP Auditing)	To be confirmed after the Environmental

	Authorisation

3.2 Alternatives Considered

Alternatives being assessed for the construction of the Kusile railway line can be divided into the following categories:

- Project alternatives;
- Route alternatives;
- Operation alternatives; and
- The No-Go (no development) alternative.

These are discussed in the sections below.

3.2.1 Project Alternatives

Several strategic alternatives were considered at the conceptual phase of the Kusile power station EIA. This strategic information was again revisited during the planning phase of the project. The following project alternatives were assessed during the planning phase due to the significant cost, time implications and safety implications:

- Other means of transportation of sorbent to the Kusile power station;
- Permanent road transportation;
- Permanent rail transportation; and
- [1]A combination of road transportation (already authorised) and rail transportation as a function of the status quo.

These various alternatives were considered and the following was concluded:

- There are no other means of transporting sorbent to the power station other than by road and / or rail.
- Eskom has embarked on a major drive to reduce road transportation of its supplies due to: the large increase in the coal fired power station and transportation of supplies with the subsequent deterioration of road surfaces; longer routes thereby increase the cost of supply transport and

[1] The EIA undertaken for the Kusile power station included the proposed railway. The railway was approved by the DEAT but was deemed technically unfeasible (during the detailed design phase) and hence the necessity for this EIA to be undertaken. As a direct result the construction of the railway has been delayed until environmental authorisation is received. Consequently the railway line will not be operational by the time sorbent is required for the power station and a short term solution to the transportation of sorbent is required. Therefore transportation by road has been proposed as a short term intervention whilst the railway line is being constructed.

subsequently electricity; as well as the spreading road surface deterioration which will inevitably impact on other freight transporters.

- The planning process showed that the rail construction and operation might not be ready when the first two generation units come into operation thus necessitating an alternative sorbent transportation mechanism. However, the road to be used for transportation to the station was approved as part of the Kusile power station processes. The road is in the process of being constructed and will serve to transport sorbent until the railway line is commissioned.

It was therefore decided in the planning phase that, for the purposes of this EIA, rail transportation (long term) will be assessed.

3.2.2 Route Alternatives

The new Kusile power station requires the delivery of sorbent to the plant as a reagent in the process of reducing SO_2 emissions from the power generation process. At present it is anticipated that this delivery will be best suited to rail transport. This proposed project is to construct a new railway line from the existing Pretoria - Witbank railway line to the Kusile power station. Prior to commencing with this EIA, a screening process was undertaken on six possible route alignments varying in length from 10 – 20 km. These six alternatives were screened in terms of environmental and social impacts. From the investigation the following three alignments were deemed most technically, economically, environmentally and socially feasible and are being further investigated in this EIA (Figure 3-10):

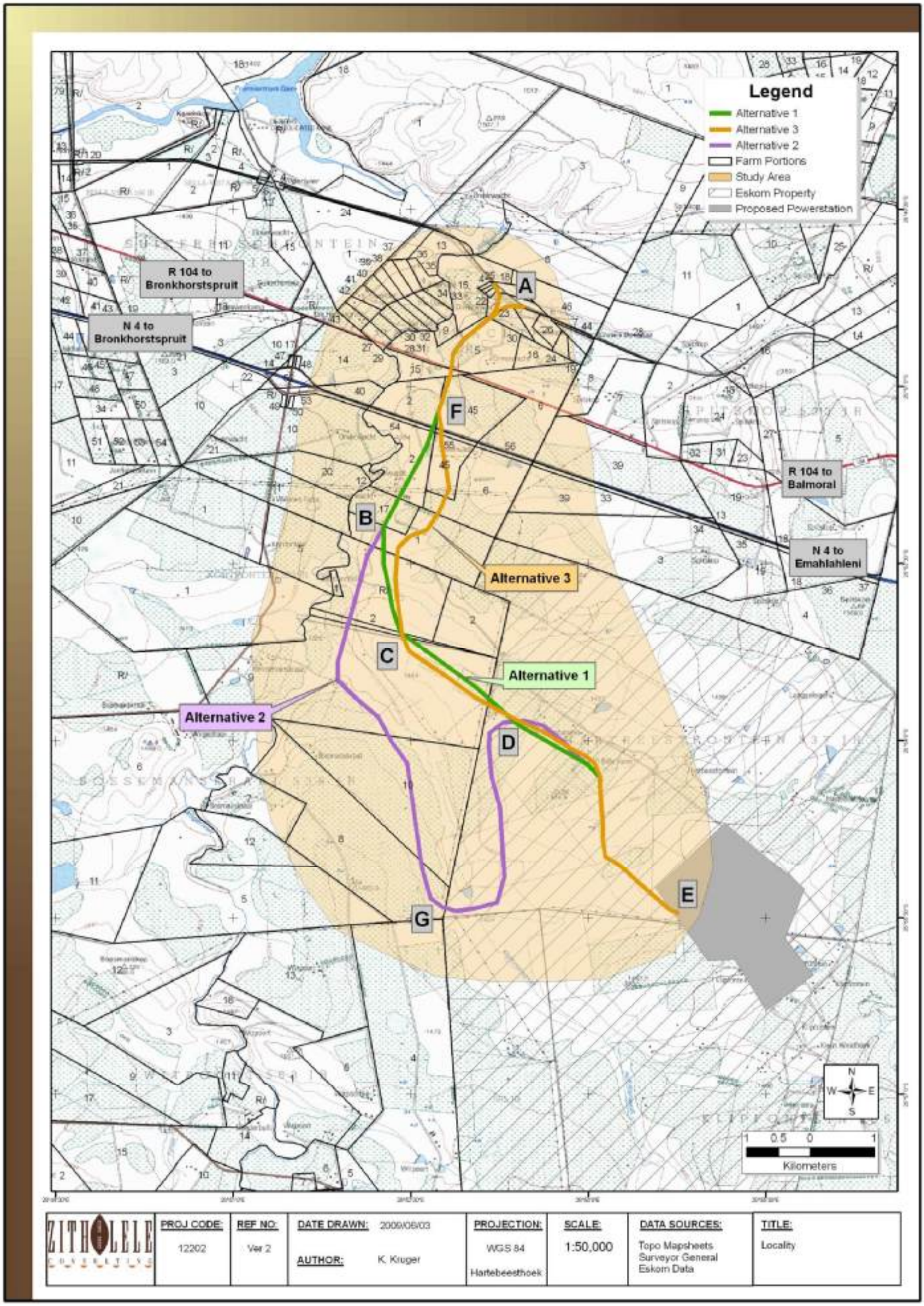


Figure 3-10: Locality of the three railway line alternatives.

Alternative 1: Kusile – Wilge River interchange shortcut

The Alternative 1 route alignment, which starts at the existing Pretoria-Witbank railway line (A), heads in a south westerly direction and crosses the N4 highway (F). Thereafter the route follows the course of the Wilge River (FB). This route then heads in a south easterly direction and crosses an unnamed tributary of the Wilge River continuing for six kilometres into the Kusile Power Station (BCDE). This route is approximately 12 km in length (Figure 3-11).

Alternative 2: Kusile - Wilge River interchange

The second alternative follows the same initial alignment as Alternative 1 (AF), but after crossing the N4 highway the alignment continues in a south westerly direction for approximately 4.5 kilometres. Thereafter the route crosses over the Klipfonteinspruit river and turns in a south easterly direction for approximately two kilometres. The route then turns south south east for 2.5 kilometres, turns eastward and crosses the Klipfonteinspruit river a second time and then turns to run in a northerly direction for three kilometres before meeting up with alternative 1 approximately 3 kilometres from the Kusile Power Station (BGDE). This route is estimated at 18 km in length (Figure 3-12).

Alternative 3: Kusile – Wilge River interchange shortcut alternative 2

The Alternative 3 route alignment follows the same initial alignment as Alternative 1 (AF) but it crosses the N4 highway 500 metres eastward of the Alternative 1 and 2 crossing (avoiding the farmstead complexes) (FCDE). The alternative rejoins alternative 1 for approximately seven kilometres before entering the Kusile Power Station. This route is very similar to Alternative 1, with some minor deviations 12.2 km (Figure 3-13).

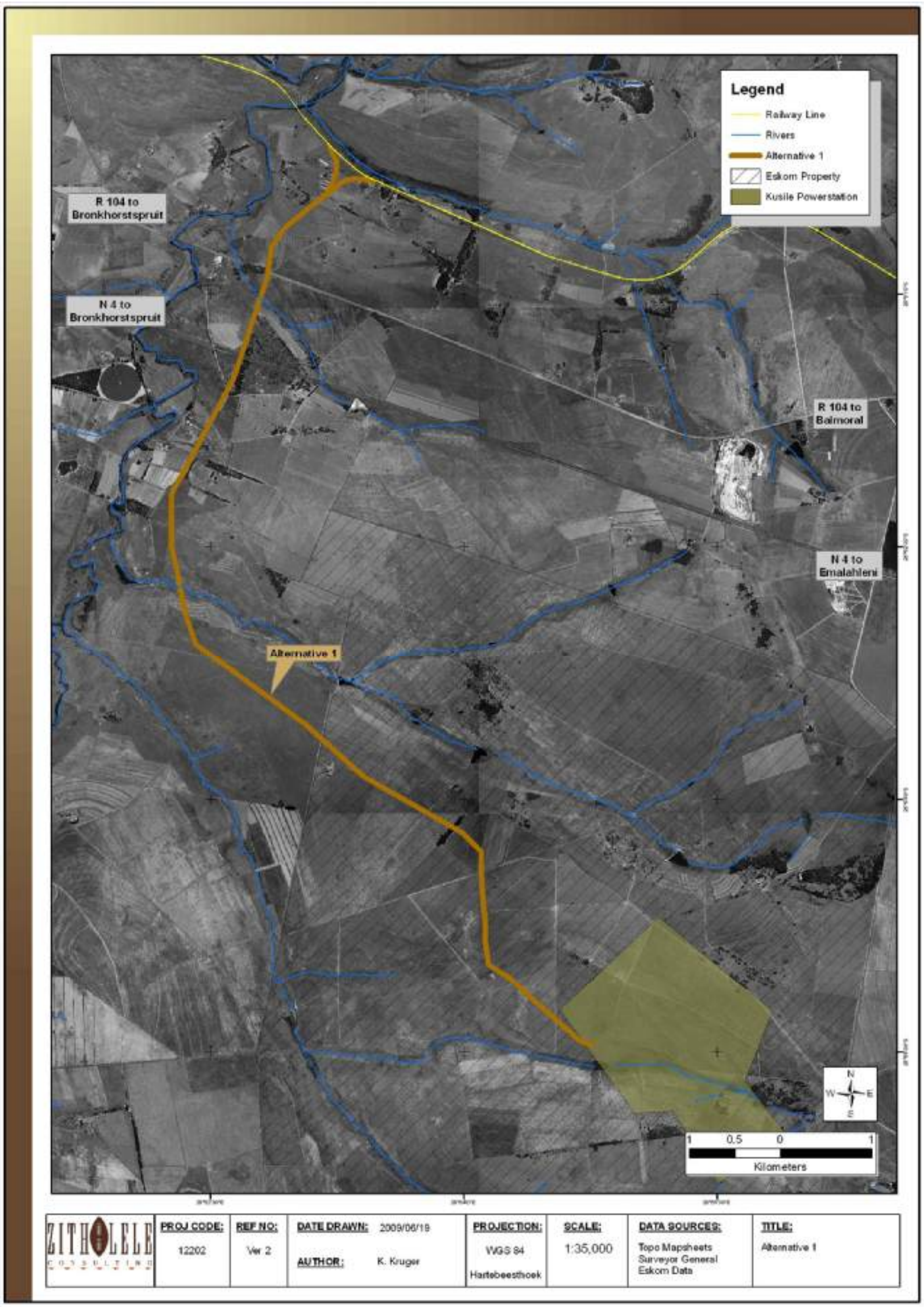


Figure 3-11: Locality of Alternative 1.

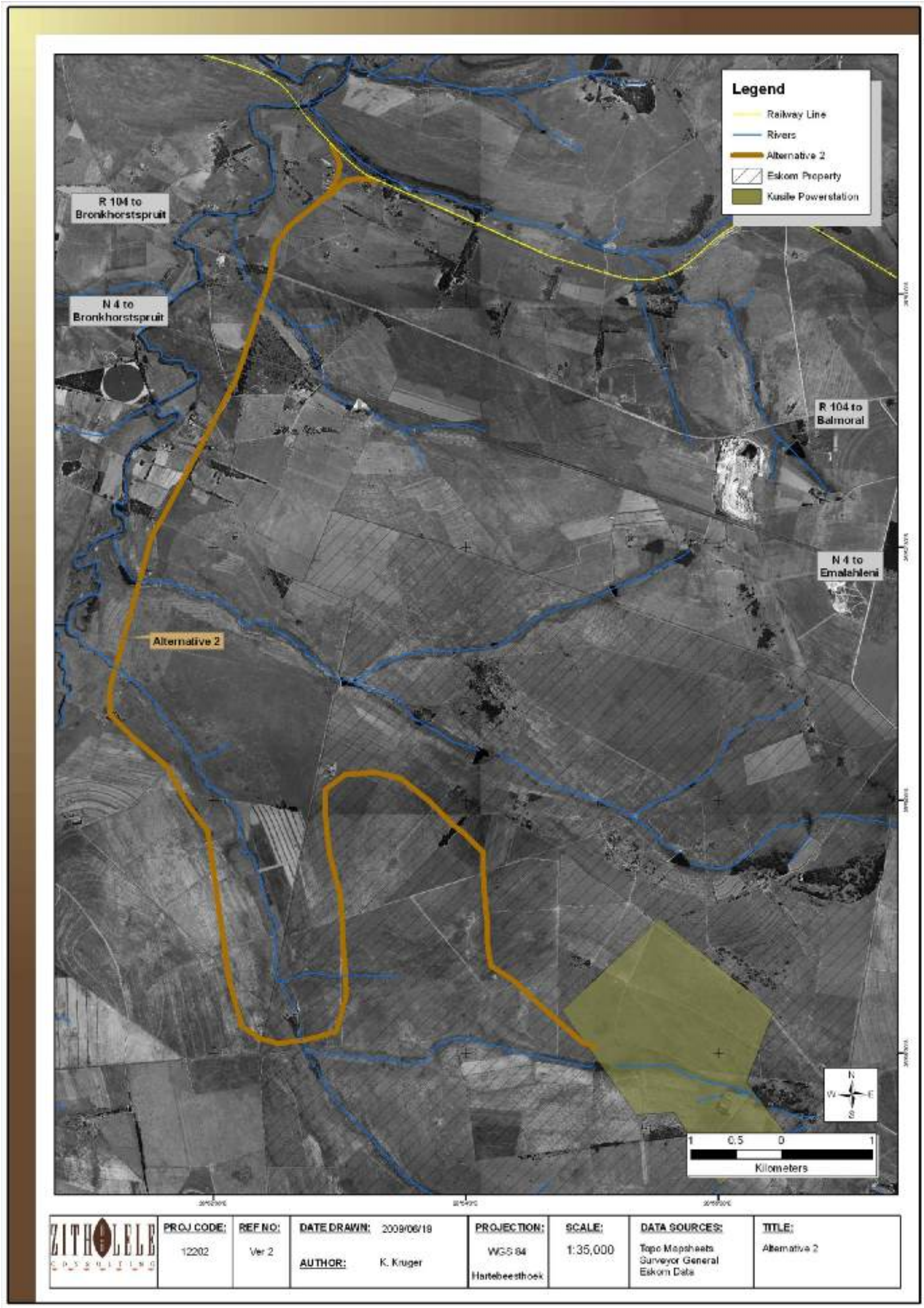


Figure 3-12: Locality of Alternative 2.

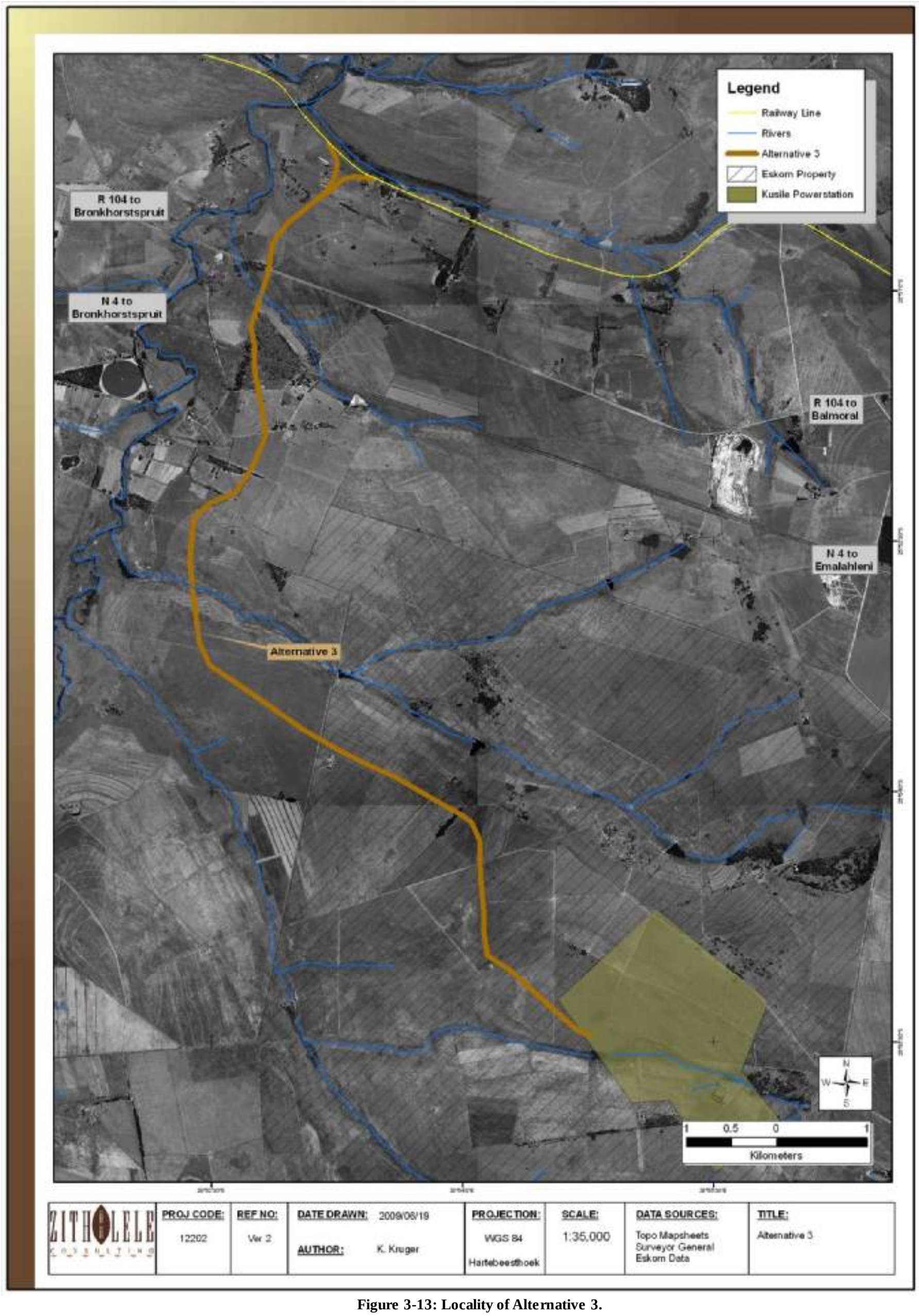


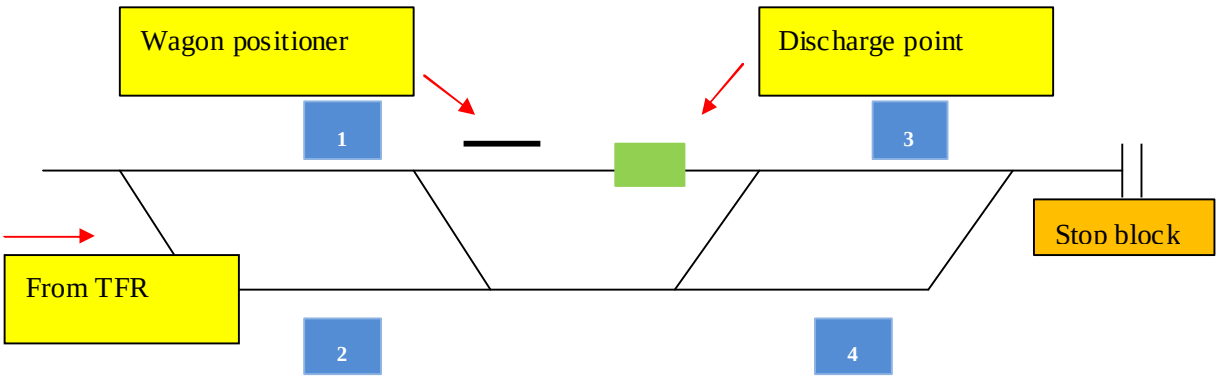
Figure 3-13: Locality of Alternative 3.

3.2.3 Operational Alternatives

Two modes of operation at the unloading facility are being investigated:

Option 1:

A loaded train will arrive on a line located in front of the unloading facility, where the locomotives will detach and run around to the back of the train to push the set of wagons to engage with an indexer (wagon positioner). The locomotive will then run back around the loaded wagons to the opposite side of the unloading facility to pull clear the set of empty wagons unloaded during the previous operation. Finally the locomotives will move around to the front of the empty wagons and the train will depart.



1. A loaded train arrives from TFR to line 1
2. The locomotive detaches, runs along Line 2 to the back of the train, and pushes it forward to engage with the wagon positioner
3. The locomotive detaches and runs via lines 2 and 4 to the back of the set of empty wagons (unloaded during the previous operation) standing in position from the discharge point and partially on Line 3
4. The locomotive runs around on Line 4 to the end of the empty wagon and pull them fully on to Line 3
5. Finally, the locomotive runs around on Line 4 to the front end of the empty wagons on Line 3, and departs back to the TFR system via Line 2.
6. The wagon positioner pushes the loaded wagons sequentially to the discharge point to be unloaded, in the same operation moving the emptied wagons along to Line 3.

Figure 3-14: Schematic layout of the operation Option 1.

Option 2

A loaded train will arrive at the yard passing the unloading facility going back on the unloading facility line until the train is on this line. The locomotives will then push the train back until the

wagons engage with the indexer system. The locomotives will then run back around the wagons on the loop to the opposite side of the unloading facility to pull clear the set of empty wagons unloaded during the previous operation, and the train will depart.

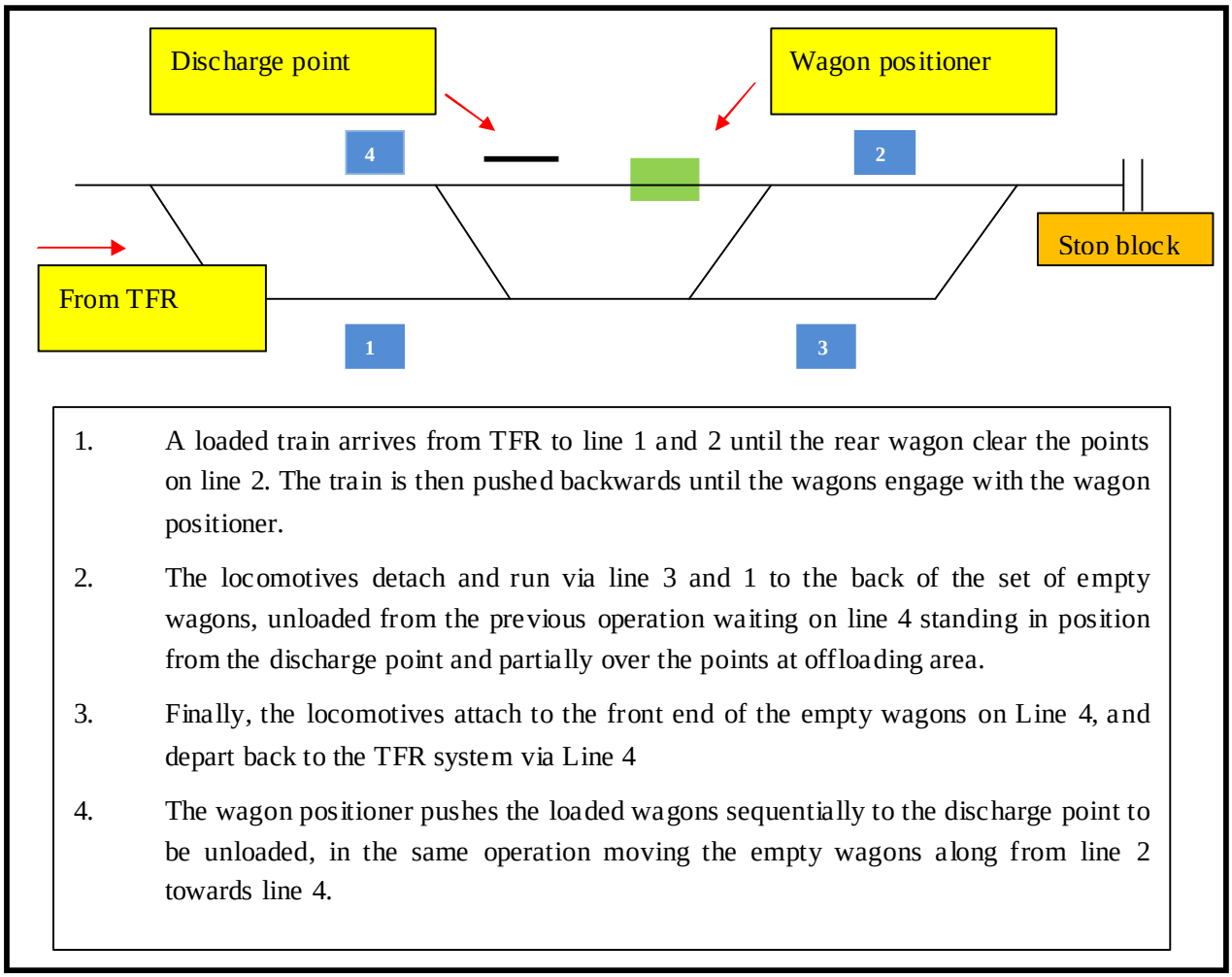


Figure 3-15: Schematic layout of the operation Option 2.

Recommended Option

The recommended operational method is to use Option 2 based on the following reasons:

- It requires fewer shunting operations;
- Reduced wear and tear of points; and
- Reduced safety risks.

3.2.4 No Go Alternative

The No-Go alternative will also be assessed further in the EIA. In the case that the project does not take place and no railway and associated activities are constructed the social, financial and environmental impacts will be assessed and compared to the aforementioned alternatives.

4 RECEIVING ENVIRONMENT

The regional environment is described in the section below. For the context of this report the regional environment refers to a 50 km radius around the study area.

4.1 Climate

4.1.1 Data Collection

Climate information was attained using the climate of South Africa database, as well as from Air Quality Impact Assessment for the Kusile power station by Airshed Planning Professionals[2].

4.1.2 Regional Description[3]

The study area displays warm summers and cold winters typical of the Highveld climate. The region falls within the summer rainfall region of South Africa, rainfall occurs mainly as thunderstorms (Mean Annual Precipitation 662 mm) and drought conditions occur in approximately 12% of all years. The mean annual potential evaporation of 2 060 mm indicates a loss of water out of the system.

The region experiences frequent frosts, with mean frost days of 41 days. In addition to frost the area is prone to hail storms during the summer time. Winds are usually light to moderate, with the prevailing wind direction north-westerly during the summer and easterly during winter.

Ambient Temperature

The long-term average (2003) maximum, mean and minimum temperatures for Kusile is given in Table 4-1.

Table 4-1: Long Term Temperature Data for Kendal (Airshed, 2006)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Maximum	31	32	32	29	24	20	22	24	29	30	30	32
Mean	21	22	20	18	13	10	10	12	18	20	21	22
Minimum	15	15	12	11	6	4	3	4	10	13	14	15

[2] Air Quality Impact Assessment for the Proposed New Coal-fired Power Station (Kendal North) in the Witbank Area. Report No.: APP/06/NMS-01 Rev 0.2, 2006.

[3] When referring to a regional description a 20 kilometer radius around the proposed corridors is taken into consideration.

The annual maximum, minimum and mean temperatures for Kusile are given as 32°C, 3°C and 17°C, respectively, based on the 2003 record. The average daily maximum temperatures range from 32°C in December to 20°C in July, with daily minima ranging from 15°C in January to 3°C in July.

4.2 Geology

4.2.1 Methodology and Data Sources

The geological analysis was undertaken through the desktop evaluation using a Geographic Information System (GIS) and relevant data sources (April 2009). The geological data was taken from the Environmental Potential Atlas Data from the Department of Environmental Affairs (DEA).

4.2.2 Regional Description

The main rock types found in the region are sandstone, tillite and shale. The routes exclusively fall in the shale geology.

None of these geologies provide any sensitivity to the construction of a railway line. The shale is known to weather into soils with relatively high clay contents, which in turn could provide stability issues, but these would be limited to the drainage lines and watercourses on site.

The sandstone geology found on site forms part of the Mpumalanga coal fields which is almost exclusively overlain by sandstone. The geologies described above are illustrated in Figure 4-1 below.

4.2.3 Sensitivities

No geology or drainage features within the study area are considered to be sensitive, although shales might create concerns with stability if weathered, on drainage lines and watercourses.

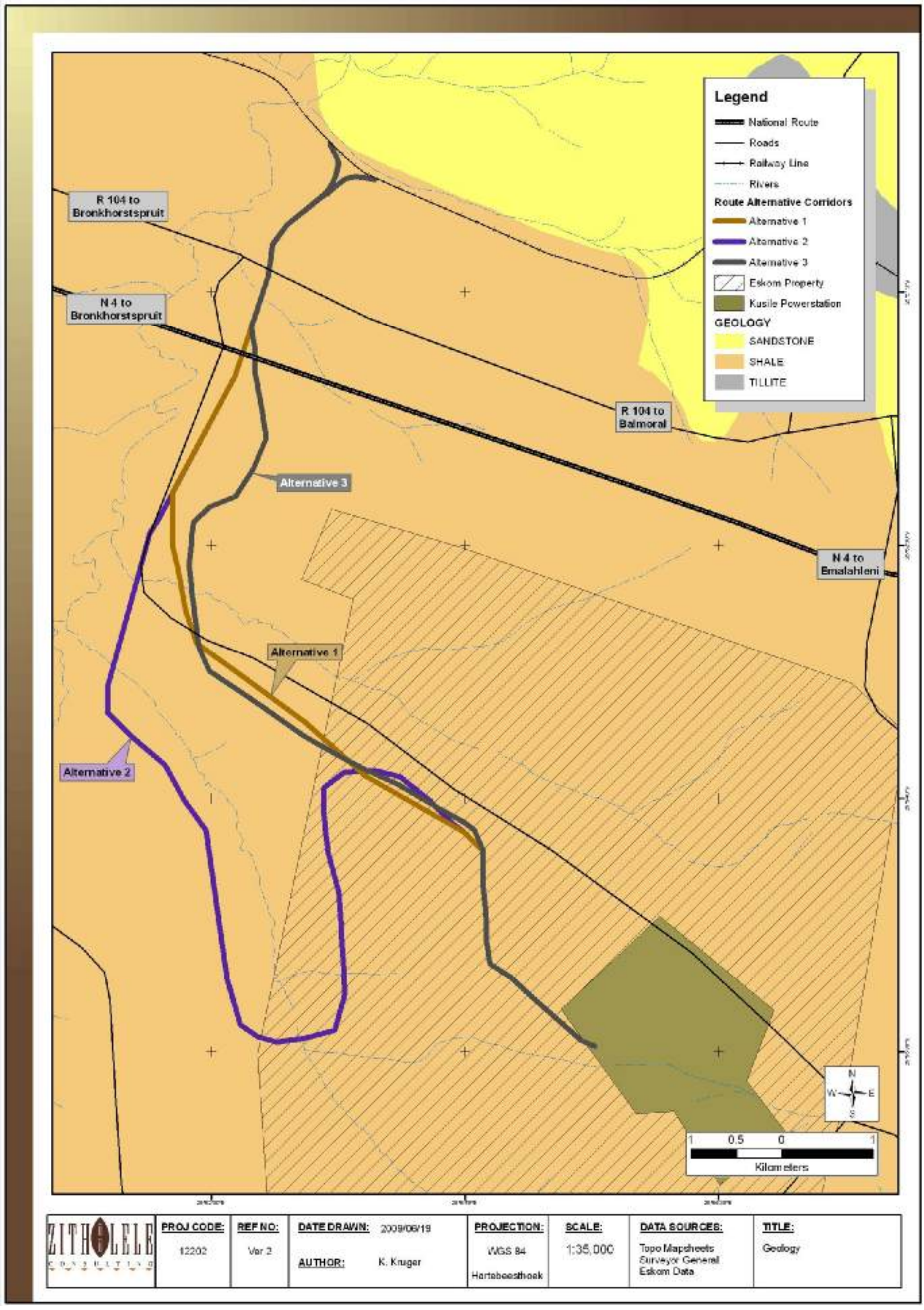


Figure 4-1: Regional Geology of the area

4.3 Topography

4.3.1 Data Collection

The topography data was obtained from the Surveyor General's 1:50 000 toposheet data for the region, namely 2528DD. Contours were combined from the topographical mapsheets to form a combined contours layer. Using the Arcview GIS software the contour information was used to develop a digital elevation model of the region as shown in Figure 4-2 below.

4.3.2 Regional Description

The topography of the region is gently undulating to moderately undulating landscape of the Highveld plateau. Some small scattered wetlands and pans occur in the area, rocky outcrops and ridges also form part of significant landscape features in the area. The altitude ranges between 1 360 – 1 600 metres above mean sea level (mamsl). Figure 4-2 provides an illustration of the topography of the site, while Figure 4-3 shows the ridges found on site. With regards to ridges, all the routes avoid the ridges found on site, but it should be noted that in various places the routes do come quite close to ridges.

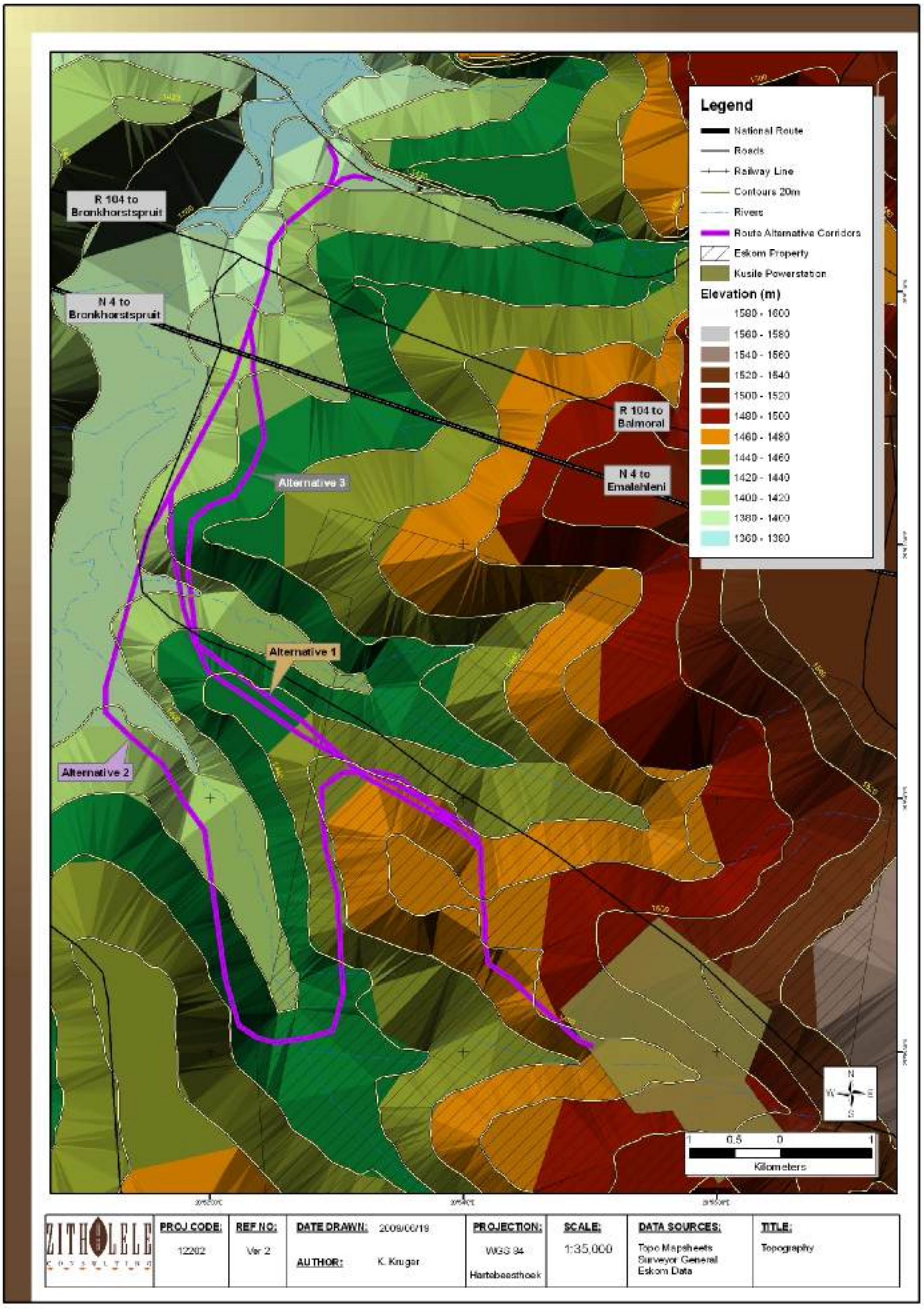


Figure 4-2: Topography of the area.

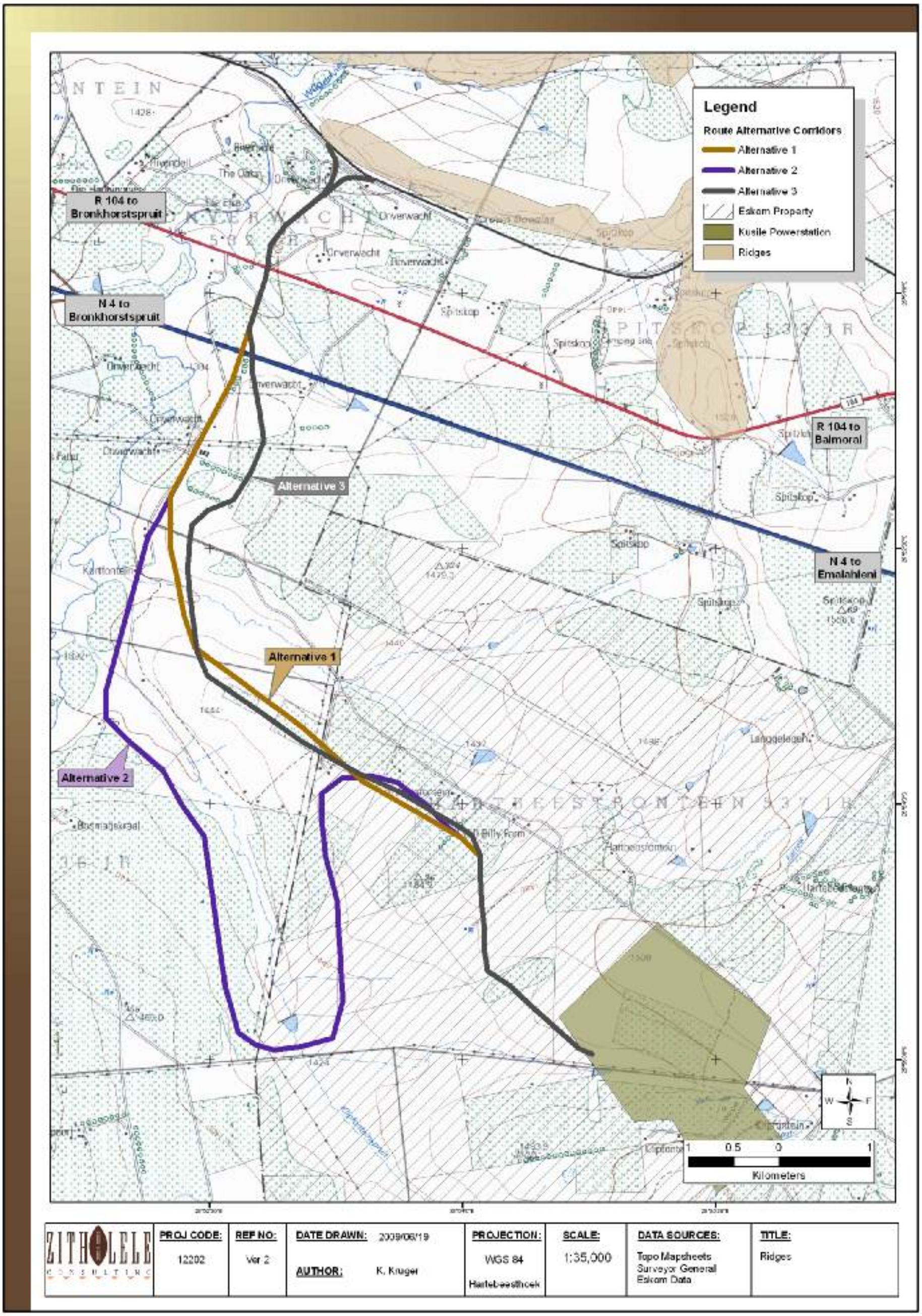


Figure 4-3: Ridges found in the area.

4.4 Surface Water

4.4.1 Data Collection

The surface water data was obtained from the WR90 database from the Water Research Council. The data used included catchments, river alignments and river names. In addition water body data was obtained from the CSIR land cover database (1990) to show water bodies and wetlands. This information was ground truthed during a site visit.

4.4.2 Regional Description

The main drainage feature of the area is the Wilge River which drains northwards. Several tributaries are also found in the area including the Klipfonteinspruit and several unnamed streams. In addition to the streams several dams can also be found in the region as illustrated in Figure 4-4 and Figure 4-5 below. The streams and their associated dams support a number of faunal and floral species uniquely adapted to these aquatic ecosystems and therefore all surface water bodies are earmarked as sensitive features and should be avoided as far as possible.

Figure 4-4: Wetlands in the region (Klipfonteinspruit).

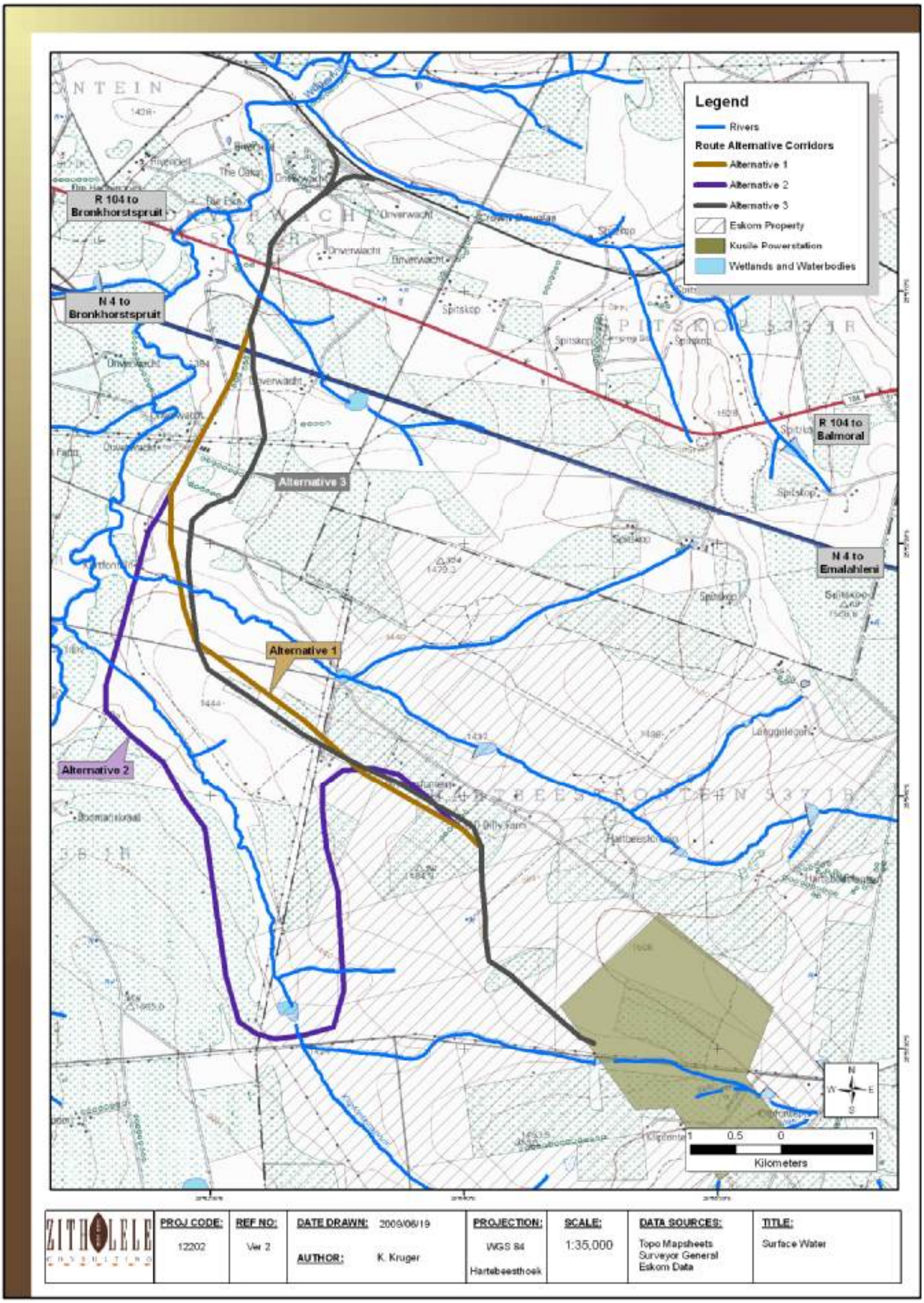


Figure 4-5: Surface water and drainage features of the northern section of the area.

From Figure 4-5 above, it is clear that all the alternatives cross a stream or river at some point. Table 4-2 below gives an illustration of the number of river crossings per Alternative. It is evident from the table that Alternatives 1 and 3 have the least crossings, while Alternative 2 could be problematic.

Table 4-2: Number of stream crossings per Alternative

Alternative	Number of Stream Crossings
Alternative 1	2 x tributaries
Alternative 2	3 x tributaries and the Klipfonteinspruit twice (5 crossings)
Alternative 3	2 x tributaries

4.5 Land Use

4.5.1 Data Collection

The land use data was obtained from the CSIR Land Cover database and supplemented with visual observations on site.

4.5.2 Regional Description

The land use is dominated by maize, grazed fields, coal mines and power stations. From the map below (Figure 4-6) it can be seen that the proposed routes traverse only cultivation / unimproved grassland land uses and some water bodies. Water bodies are the only land use regarded as sensitive. In addition the area of the Kusile power station is currently a construction site.

From Figure 4-6 below it can be seen that all the alternatives avoid agricultural land by following the drainage lines found in the area.

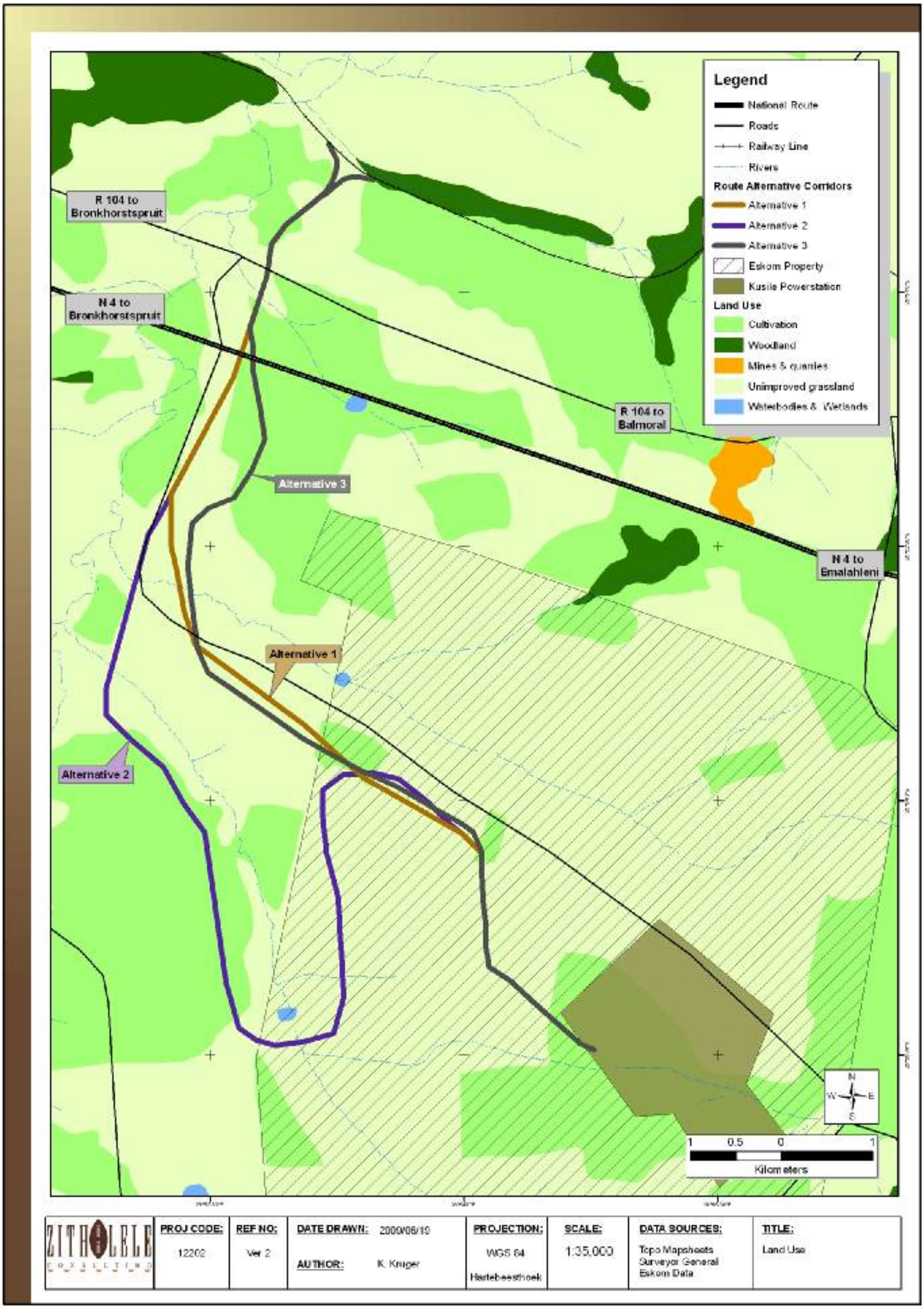


Figure 4-6: Land Use Map of the northern section of the area.

4.6 Faunal Biodiversity

4.6.1 Data Collection

A literature review of the faunal species that could occur in the area was conducted. C-Plan data provided from the Mpumalanga provincial department was used to conduct a desktop study of the area. This data consists of terrestrial components; ratings provide an indication as to the importance of the area with respect to biodiversity.

4.6.2 Regional Description

The biodiversity rating for the bulk of the site (Figure 4-7) is rated as least concern and no natural habitat remaining. The final stages of all the alternatives are situated in areas rated as important. It should be noted that the area at the end of the routes is currently the construction site for the Kusile power station and therefore sensitivities indicated within this area can be ignored.

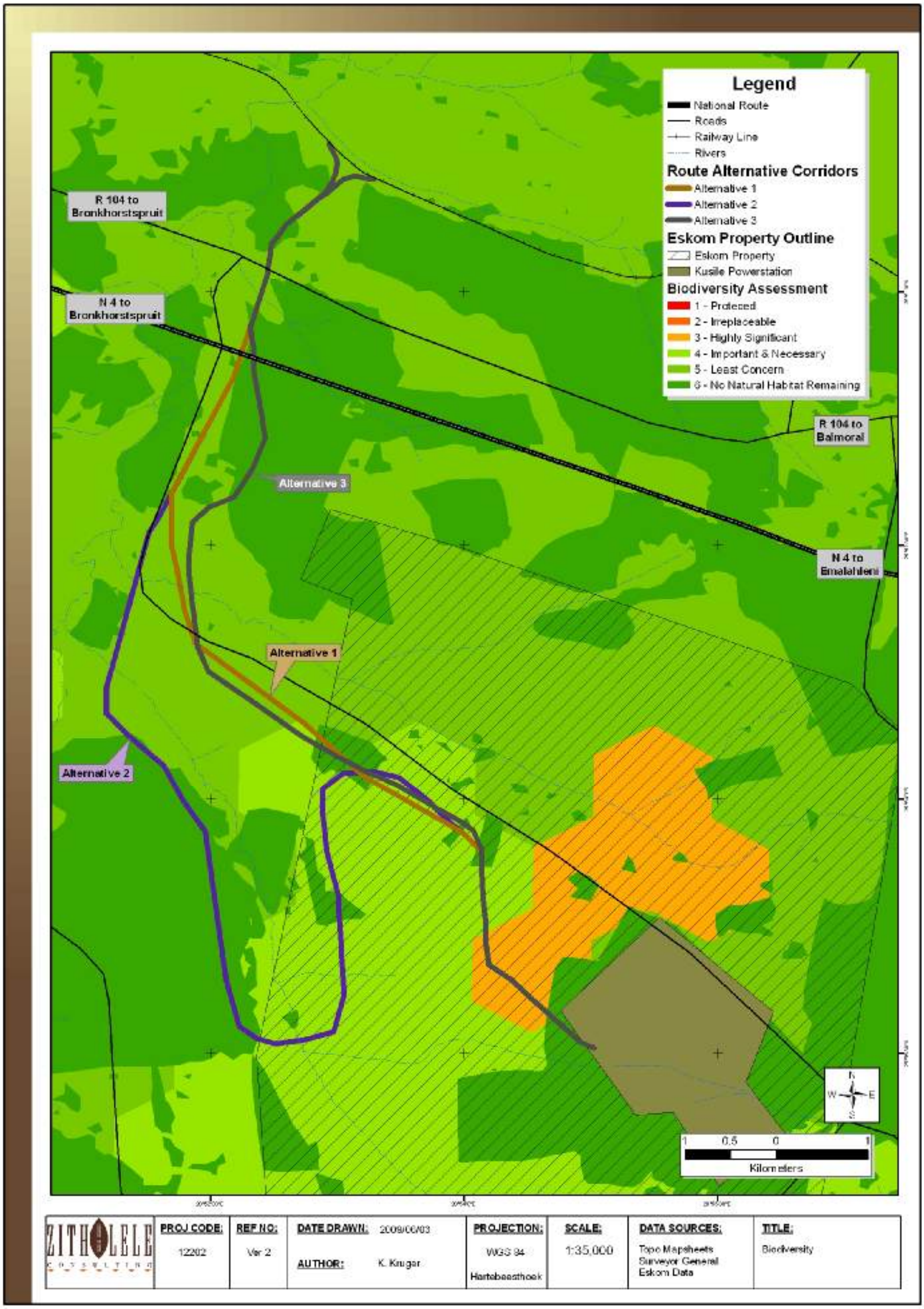


Figure 4-7: Biodiversity of the area.

4.7 Floral Biodiversity

4.7.1 Methodology and Data Sources

The floral data below is taken from The Vegetation of South Africa, Lesotho and Swaziland (Mucina and Rutherford 2006).

4.7.2 Regional Description

According to the South African National Biodiversity Institute, the study area falls within the Grassland Biome, where most of the country's maize production occurs. The vegetation of the area is classified as Soweto Highveld Grassland, extending from Mpumalanga to Gauteng and to a very small extent into Free State and North West.

The study area comprises of the Rand Highveld Grassland, Eastern Highveld Grassland and Eastern Temperate Freshwater Wetlands vegetation units as classified by Mucina and Rutherford[4]. Each of these vegetation units are described in more detail below.

Rand Highveld Grassland

Rand Highveld Grassland is found in the highly variable landscape with extensive sloping plains and ridges in the Gauteng, North-West, Free State and Mpumalanga Provinces. The vegetation type is found in areas between rocky ridges from Pretoria to Witbank, extending onto ridges in the Stoffberg and Roossenekal regions as well as in the vicinity of Derby and Potchefstroom, extending southwards and north-eastwards from there. The vegetation is species rich, sour grassland alternating with low shrubland on rocky outcrops. The most common grasses on the plains belong to the genera *Themeda, Eragrostis, Heteropogon* and *Elionurus*. High numbers of herbs, especially *Asteraceae* are also found. In rocky areas shrubs and trees prevail and are mostly *Protea caffra, Acacia caffra, Celtis africana* and *Rhus spp*.

This vegetation type is poorly conserved (approx 1 %) and has a target of 24 % of the vegetation type to be conserved. Due to the low conservation status this vegetation type is classified as endangered. Almost half of the vegetation type has been transformed by cultivation, plantations, urbanisation or dam-building. Scattered aliens (most prominently *Acacia mearnsii*) are present in the unit.

Eastern Highveld Grassland

The Eastern Highveld Grassland is found in the Mpumalanga and Gauteng Provinces on the plains between Belfast in the east and the eastern side of Johannesburg in the west and extending southwards to Bethal, Ermelo and west of Piet Retief. The landscape is dominated by undulating plains and low

[4] The Vegetation of South Africa, Lesotho and Swaziland, Muccina and Rutherford 2006.

hills with short dense grassland dominating belong to the *genera Themeda, Aristida, Digitaria, Eragrostis, Tristachya*. Once again woody species are prevalent on the rocky outcrops.

In terms of conservation and disturbance, 44 % of the vegetation type is already transformed by cultivation, plantations, mines, and urbanisation. There is no serious alien invasion however *Acacia mearnsii* dominates in certain areas

Eastern Temperate Freshwater Wetlands

Another vegetation type associated with the region is the Eastern Temperate Freshwater Wetlands, found around water bodies and embedded within the Grassland biome. Eastern Temperate Freshwater Wetlands are typically found in flat landscapes or shallow depressions filled with (temporary) water bodies supporting zoned systems of aquatic and hydrophillous (water loving) vegetation of temporarily flooded grasslands and ephemeral herblands. Important species include *Cyperus congestus, Phragmites australis, Marsilea farinose, Rorippa fluviatalis, Disa zuluensis, Crassula tuberella* and the carnivorous herb *Utricularia inflexa.* These wetlands are one of the most sensitive vegetation units found in the region and have been extensively modified by mining and industrial activities in the region.

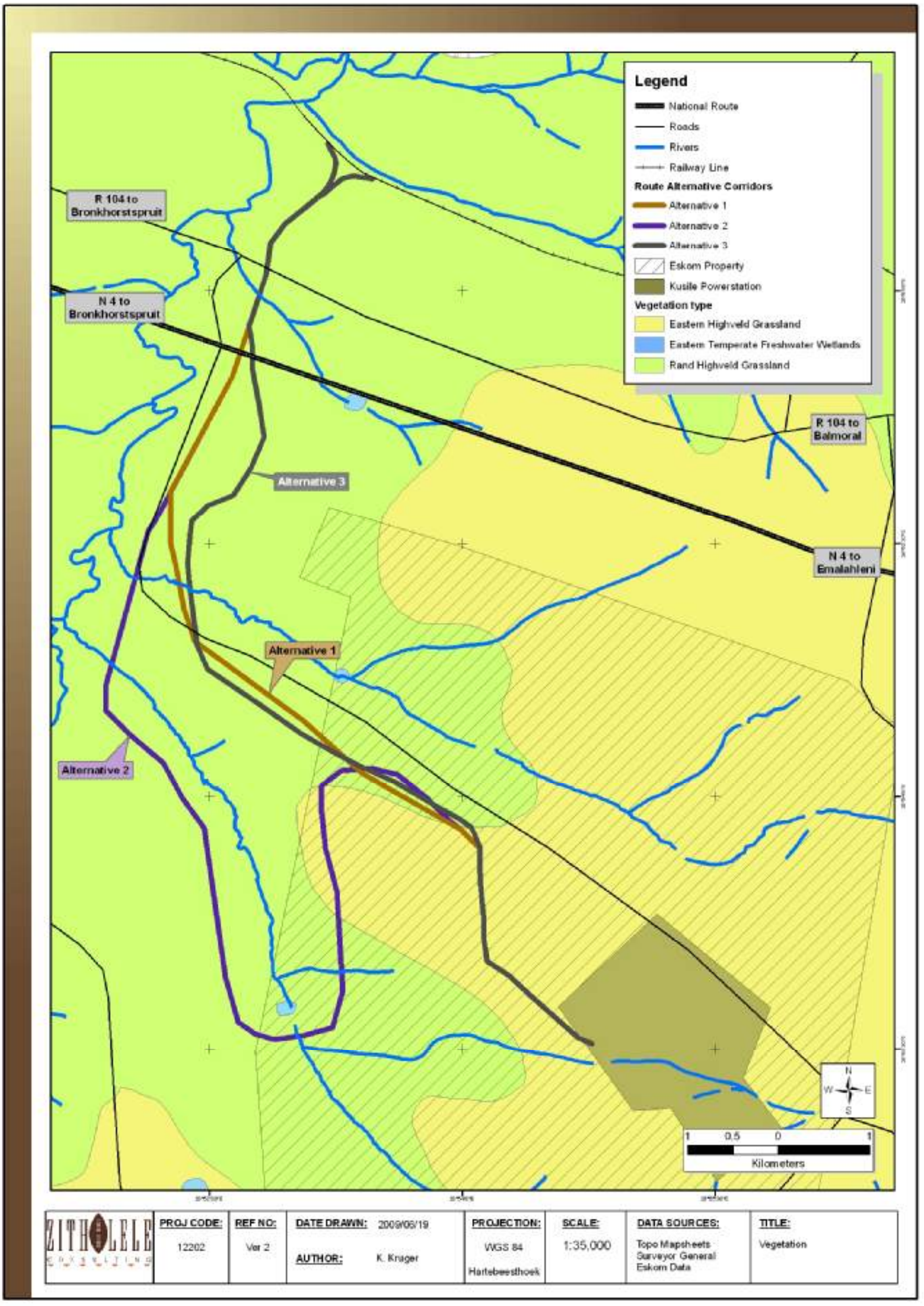


Figure 4-8: Vegetation of the area.

4.8 Infrastructure

4.8.1 Methodology and Data Sources

Infrastructure was identified using the 1:50 000 topocadastral maps of the area, and information provided by Eskom regarding existing services. A site visit to the area was undertaken to verify this information.

4.8.2 Regional Description

Access to the proposed project area is via the N4 national road. The study area is traversed to the west by the Bossemanskraal road. The primary infrastructure within the study area is:

- The N4 national road between Bronkhorstspruit (towards Pretoria) and Emalahleni (Witbank);
- The R 104 road between Bronkhorstspruit and Balmoral;
- The R545 between Kendal and Balmoral;
- The new Eskom road (currently under construction) between the N12 and the R545 (running along the western boundary of the Kusile Power Station);
- The existing railway line between Bronkhorstspruit (towards Pretoria) and Emalahleni (Witbank);
- Numerous 400 kV power lines traversing the area;
- Several dirt farm roads; and
- The current Kusile power station construction site.

4.8.3 Sensitivities

Due to the rural nature of the area, very few roads are available to travellers and residents. If any of these roads becomes non-accessible or are damaged as a result of project activities, access in the area would be limited. The same case is applicable for the existing railway line. Furthermore the power lines on site form part of the national power grid. Therefore all access routes, railway lines and power lines are regarded as sensitive features.

4.9 Cultural and historical resources

There are no known heritage resources present within the proposed project area, however the occurrence of cultural and historical resources will be investigated during the EIA phase.

5 SCOPING PROCESS

5.1 Technical (EIA) Process

For the Scoping Phase of this EIA, the following technical process has been followed:

5.1.1 Consultation with client

On notification and receipt of the appointment letter from Eskom, a project inception meeting was held on 13 March 2009 between Eskom and the Zitholele Consulting Project Team. During this project kick-off meeting the following was discussed:

- Project Scope and Requirements;
- Project Schedule;
- Identification of key stakeholders and role players; and
- Analysis of the preliminary railway line route alignments.

5.1.2 Consultation with authorities, application forms and landowner consent

The DEA EIA application form (Appendix B) for the proposed project was submitted to the DEA on 8 April 2009. Copies of the application form and notification of this application form were forwarded to the GDACE and the MDALA as commenting authorities. As a point of departure, the I&AP database developed through the Kusile EIA process was used for initial project notification and groundtruthed by the Zitholele team to identify additional I&APs. The list of potentially affected landowners is attached as Appendix C to this report. During the Scoping Phase the list of landowners were confirmed and landowner consent forms (Appendix C) were signed.

5.1.3 Site Visit

A site visit was conducted by on 15 April 2009 and 9 June 2009 with the objective of familiarising the project team with the area.

5.1.4 Draft Scoping Report and Plan of Study for EIA

The Draft Scoping Report (DSR) was prepared with information and issues identified during the Scoping Phase activities. The Plan of Study (PoS) for EIA and the Terms of Reference (ToR) for the envisaged specialist studies are included in Chapter 6 of this report. The DSR and PoS for EIA have been updated based on comments from key commenting authorities, public review and comments obtained from I&APs. This Final Scoping Report and the PoS (Chapter 7 and Appendix K) for EIA have been compiled based on the comments received on the DSR and are being submitted to the DEA for acceptance and approval.

5.2 Public Participation Process

Public participation is an essential and legislative requirement for environmental authorisation. The principles that demand communication with society at large are best embodied in the principles of the National Environmental Management Act (Act 107 of 1998, Chapter 1), South Africa's overarching environmental law. In addition, Section 24 (5), Regulation 56 of GNR 385 under the National Environmental Management Act, guides the public participation process that is required for an Environmental Impact Assessment (EIA) process.

The public participation process for the proposed Kusile railway has been designed to satisfy the requirements laid down in the above legislation and guidelines. Figure 5-1 provides an overview of the EIA technical and public participation processes, and shows how issues and concerns raised by the public are used to inform the technical investigations of the EIA at various milestones during the process. This section of the report highlights the key elements of the public participation process to date.

5.2.1 Objectives of public participation in an EIA

The objectives of public participation in an EIA are to provide sufficient and accessible information to I&APs in an objective manner sp as to:

- During Scoping:
  - Assist the I&APs with identification of issues of concern, and providing suggestions for enhanced benefits and alternatives.
  - Contribute their local knowledge and experience.
  - Verify that their issues have been considered and to help define the scope of the technical studies to be undertaken during the Impact Assessment.
- During Impact Assessment:
  - Verify that their issues have been considered either by the EIA Specialist Studies, or elsewhere.
  - Comment on the findings of the EIA, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

The key objective of public participation is to ensure transparency throughout the process and promote informed decision making.

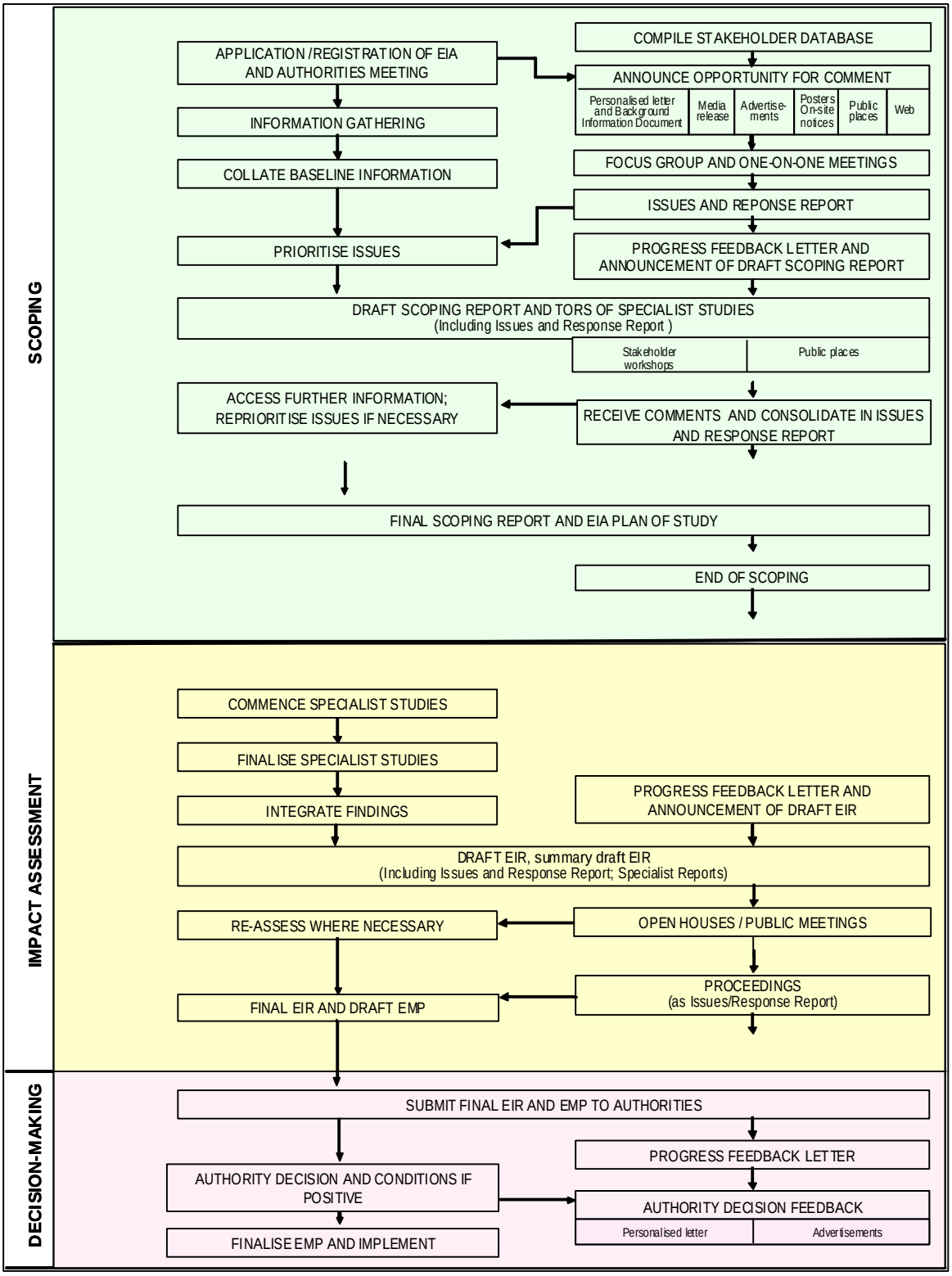


Figure 5-1: Technical and public participation process and activities that comprise the Environmental Impact Assessment for the proposed Kusile Railway Project.

5.2.2 Identification of interested and affected parties

The identification of stakeholders is ongoing and is refined throughout the process. As the on-the-ground understanding of affected stakeholders improves through interaction with various stakeholders in the area the database is updated. The identification of key stakeholders and community representatives (land owners and occupiers) for this project is important as their contributions are valuable in informing the EIA process. The identification of key stakeholders was done in collaboration with Eskom (through the I&AP database for the Kusile Power Station), the local municipalities and other organisations in the study area.

The stakeholders' details are captured on Maximiser 9, an electronic database management software programme that automatically categorises every mailing to stakeholders, thus providing an ongoing record of communications - an important requirement by the authorities for public participation. In addition, comments and contributions received from stakeholders are recorded, linking each comment to the name of the person who made it.

According to the NEMA EIA Regulations under Section 24(5) of NEMA, a register of I&APs must be kept by the public participation practitioner. Such a register has been compiled and is being kept updated with the details of involved I&APs throughout the process (See Appendix F)

5.2.3 Announcement of opportunity to become involved

The opportunity to participate in the EIA was announced in June 2009 as follows:

- Distribution of a letter of invitation to become involved, addressed to individuals and organisations, accompanied by a Background Information Document (BID) containing details of the proposed project, including a map of the project area and the alternative routes, and a registration sheet (Figure 5-2 and Appendix H);

Figure 5-2: Background Information Documents were distributed in the area.

- Advertisements were placed in the following newspapers (Appendix D):

Table 5-1: Advertisements placed during the announcement phase.

NEWSPAPER	DATE
Middelburg Herald	12 June 2009
Middelburg Observer	12 June 2009
Beeld	10 June 2009

Witbank News	12 June 2009
Streeknuus	12 June 2009
Citizen	10 June 2009
Beeld	11 June 2009

- Notice boards were positioned at prominent localities during June 2009. These notice boards were placed along each alternative route, at conspicuous places and at various public places (Appendix D). Site notices were placed prominently to invite stakeholder participation (Figure 5-3).

Figure 5-3: Site notice boards were put up in the study area.

5.2.4 Obtaining comment and contributions

The following opportunities were available during the Scoping phase for contribution from the I&APs:

- Completing and returning the registration/comment sheets on which space was provided for comment.
- Providing comment telephonically or by email to the public participation office.
- Attending stakeholder meetings that were widely advertised (see table below) and raise comments there.

Issues relevant to the current project configuration have been considered and will be carried forward into the Impact Assessment phase.

Table 5-2: List of stakeholder meeting and open house that was advertised and held as part of the public review period of the Draft Scoping Report.

DATE	VENUE
Thursday, 6th August 2009 at 17:30	Kaia Manzi Resort

The minutes of the public meetings are attached to this Final Scoping Report.

5.2.5 Issues and Response Report and acknowledgements

The issues raised during the announcement, were captured in an Issues and Response Report Version 1, which was appended to the DSR. This report was updated to include additional I&AP contributions that were received as part of the Scoping phase process. The issues and comments raised during the public review period of the Draft Scoping Report have been added to the report as Version 2 of the Issues and Response Report which is appended to this FSR (Appendix G). The contributions made by I&APs are acknowledged in writing.

5.2.6 Draft Scoping Report

The purpose of the Public Participation Process (PPP) in the DSR was to enable I&APs to verify that their contributions were captured, understood and correctly interpreted, and to raise further issues. At the end of Scoping, the issues identified by the I&APs and by the environmental technical specialists, were used to define the Terms of Reference for the Specialist Studies that will be conducted during the Impact Assessment Phase of the EIA. A period of four weeks was available for public review of the DSR (from 27 July to 27 August 2009).

In addition to media advertisements and site notices that announced the opportunity to participate in the EIA, the opportunity for public review was announced as follows:

- In the Background Information Document (June 2009).
- In advertisements published (see Table **5-1** above and Appendix D) to advertise the proposed project.
- In a letter sent out on 8 June 2009, and addressed personally to all individuals and organisations on the stakeholder database.

The Draft Scoping Report, including the Issues and Response Report Version 1, was distributed for comment as follows:

- Left in public venues within the vicinity of the project area. (these are listed in Table 5-3 below);
- Mailed to key stakeholders;
- Mailed to I&APs who requested the report;
- Available on the Eskom and Zitholele websites; and
- Copies were made available at the public meetings.

I&APs could comment on the report in various ways, such as completing the comment sheet that accompanied the report, and submitting individual comments in writing or by email.

Table 5-3: List of public places where the Draft Scoping Report was made available

PLACE	CONTACT PERSON	TELEPHONE
Witbank Public Library	Ms Lindi Van Papendorp - Librarian	(013) 690 6229
Kungwini Public Library	Mrs Brenda Smith - Librarian	(013) 932 6305

5.2.7 Final Scoping Report

This Final Scoping Report has been updated with additional issues raised by I&APs and contains new information that was generated as a result of the process. The FSR is being submitted to the Authorities (DEA) and key I&APs, and to those individuals who specifically requested a copy. I&APs have been notified of the availability of the report.

In the Impact Assessment Phase of the EIA Specialist Studies will be conducted to assess the potential positive and negative impacts of the proposed project, and to recommend appropriate measures to enhance positive impacts and avoid or reduce negative ones. I&APs will be kept informed of progress with these studies.

5.2.8 Public participation during the Impact Assessment

Public participation during the impact assessment phase of the EIA will mainly involve a review of the findings of the EIA, presented in a Draft Environmental Impact Report (DEIR), the Draft Environmental Management Plan (EMP) and the volumes of Specialist Studies.

I&APs will be advised in good time of the availability of these reports, how to access them, and the dates and venues of public and other meetings where the contents of the reports will be presented for comment.

6 ISSUES IDENTIFIED FOR IMPACT ASSESSMENT

The proposed Kusile railway project is anticipated to impact on a range of biophysical and socio-economic aspects of the environment. The main purpose of the EIA process is to evaluate the significance of these potential impacts and to determine how they can be minimized or mitigated.

It should be noted that a comprehensive Environmental Management Plan (EMP) will be developed and implemented to regulate and minimize the impacts during the construction and operational phases. The potential environmental impacts identified during the Scoping Phase, which will be investigated further in the EIA phase of the project are summarised in Table **6-1** below.

Table 6-1: Potential Environmental Impacts to be investigated in the EIA Phase.

Environmental Element	Potential Environmental Impact
Topography and Land Use	**Visual Environment** 1.) Construction of the railway lines and associated infrastructure may alter the visual environment. A decrease in the quality of the visual environment may affect land uses. 2.) The presence of a railway line throughout operation may decrease the visual environment.
Geology, Soil and Land Capability, and Drainage Features	**Geotechnical** 1.) Due to the lack of dolomite or sensitive geology, no impact is expected on the geological receiving environment. 2.) A phase (I) geotechnical investigation / professional opinion is required due to the nature of the development. **Drainage Features (Wetland Delineation, Groundwater and Aquatic Ecology)** 1.) Insufficient rehabilitation during and post construction may result in erosion of the landscape. Eroded materials may enter the surface water environment contributing to sedimentation of the local surface water resources. 2.) Crossing of streams and / or rivers can be destructive to sensitive habitats. **Soil and Land Capability (Agricultural Potential)** 1.) Insufficient control measures during the construction phase may result in erosion, compaction, and sterilisation of soil resources. 2.) A consequence of impacts to the soil resource is a reduction in land capability. 3.) Poor soil amelioration measures during the rehabilitation phase may result in a lack of vegetation establishment. Thus contributing to the failure of rehabilitation measures.
Climate	**Air Quality** Local climate conditions do not appear to be of a significant concern to the project. The project will not contribute to local or global climate change. However the rail will be transporting limestone which may result in a decrease in the air quality if not covered.
Infrastructure	**Railway Lines** 1.) Unsuitably located railway lines may block existing farm roads

Environmental Element	Potential Environmental Impact
	and isolate farm properties. 2.) Either farm roads crossings must be minimised or must be done in a matter to eliminate safety incidents. **Power Lines** 1.) Cognisance must be taken of existing power lines, and potential temporary power line deviations. **Roads** 1.) Cognisance must be taken of existing roads, and potential temporary road deviations. **Construction Camp** 1.) The construction camp, although temporary, may negatively impact several environmental elements as a result of: a. Hydro-carbon storage and handling on site; b. Handling, storage, and management of dangerous / hazardous goods on site i.e. welding, paints, cleaning solvents etc; c. Vegetation clearing and site establishment; d. Vehicle maintenance; e. Transportation and handling of construction materials; and f. Cement batching in the batching plant.
Flora	**Vegetation Clearing (Terrestrial Ecology)** 1.) Vegetation clearing at the construction camp, along access roads, and along the approved railway route will result in negative impacts to the flora on site. **Alien Invasive Species** 1.) Disturbed areas will be prone to Alien Invasive species infestation.
Fauna	**Terrestrial Ecology and Avi-fauna** The impacts to vegetation will negatively impact on habitat, and consequently the faunal elements of the receiving environment.
Cultural and Historical Resources	**Heritage** Based on currently available information no impacts are expected to the cultural and historical environment however a Heritage Impact Assessment will be undertaken due to the presence of graves in the study area.
Socio-Economic Environment and Safety and Security	**Traffic and Risk** 1.) During the construction phase increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. 2.) Unmanaged construction vehicles may decrease road safety to other road users. 3.) Uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction. **Noise** 1.) Uncontrolled construction activities may negatively impact on the ambient noise levels in the area. **Employment and Community Related Impacts (Social)** 1.) The news of employment opportunities may result in an influx

Environmental Element	Potential Environmental Impact
	of workers to the area, thereby impacting existing community networks and perceptions of safety and crime levels. 2.) Unmanaged workers may result in illegal township establishment and increased numbers of informal settlements. Such settlements often negatively impact a range of environmental elements. **Consultation** 1.) Unmanaged and insufficient consultation with communities and land owners often generates negative sentiment towards developments that persist beyond the construction phase of a project. 2.) Insufficient consultation may result in unnecessary impacts to local inhabitants and land owners.

7 PLAN OF STUDY FOR EIA

7.1 Technical Process

7.1.1 Prepare Specialist Investigations

The scoping phase investigations have reviewed a range of potential environmental impacts associated with the proposed development. Such an assessment, which was informed by authorities input, interested and affected parties and various professionals, a shortlist of such potentially significant environmental impacts were identified for detailed specialist assessments during the Impact Assessment phase. The specialist investigations to be conducted during the EIA-phase of this project will consist of the following studies:

- Heritage and Archaeological Assessment;
- Soils and Land Capability Assessment (including agricultural potential);
- Groundwater Investigation;
- Wetland Delineation;
- Traffic Impact Assessment;
- Air Quality Assessment;
- Noise Impact Assessment;
- Geotechnical Investigations;
- Social Impact Assessment;
- Risk Assessment;
- Ecology (Fauna and Flora – terrestrial and aquatic)
- Avi-fauna Assessment; and
- Visual Assessment.

The findings of these studies will be reflected in the EIA Report. The proposed Terms of Reference (ToR) for each of these specialist investigations is indicated in Section 7.1.2 below.

7.1.2 Specialist Studies: Terms of Reference (ToR)

ToR: Heritage and Archaeological

A Heritage Impact Assessment will be conducted to comply with Section 38 of the National heritage Resources Act (No 25 of 1999). Specific objectives of this study will be:

- Desktop study (consulting heritage data banks and appropriate literature);

- Site visit of the project area;
- Determine whether any of the types and ranges of heritage resources as outlined in Section 3 of the Act (No 25 of 1999) do occur in the project area;
- Determine what the nature, the extent and the significance of these remains are;
- Determine whether any heritage resources (including graves) will be affected by the development project; and
- If any heritage resources are to be affected by the development project mitigation measures (Phase II studies) has to be undertaken and management proposals have to be set for heritage resources which may continue to exist unaffected in or near the project area.
- Compile a report which would
    - Clearly identify possible archaeological, cultural and historical sites within the study area;
    - Identify the potential impacts of construction and operation of the proposed development on such resources, with and without mitigation;
    - Offer an opinion on a preferred route in terms of this specialist field;
    - Provide mitigation measures to ameliorate any negative impacts on areas of heritage significance;
    - Include a map illustrating the salient aspects of the report

ToR: Soils and Land Capability (including agricultural potential)

A soil and land capability investigation will be conducted for the Kusile railway project. The objectives of this study will be:

- Review existing information available;
- An aerial photographic study to assess the accessibility, vegetation cover, drainage lines, slope aspects and percentage outcrop of each of the three routes;
- A field visit to verify the aerial photographic study observations. Additionally, during the visit, the depth and properties of regolith will be judged from natural exposure (dongas) and hand augering where applicable;
- A map will be compiled of each of the alternative routes, indicating the features observed; and
- Assess the potential impacts and their significance on the agricultural potential of each alternative;
    - Propose mitigation measures to reduce or mitigate potential impacts;
- A short report will be compiled, in which the alternatives will be prioritized based on the results of the study.

ToR: Groundwater Investigation

A groundwater investigation will be conducted for the Kusile railway project. The objectives of this study will be:

- Detailed description the topography, geological and hydrogeological setting of the proposed routes;
- Characterization of the groundwater regime in a regional geological and geohydrological context with a general geological and geohydrological description, indicating the overall characteristics of the geological settings and aquifer parameters, and identification of immediate groundwater users;
- Detailed description of the aquifer parameters, such as the lateral extent of aquifers, hydraulic parameters, recharge, groundwater elevations, groundwater yields and groundwater qualities;
- Determination of pre-project groundwater quality;
- Description of the effect of project on the groundwater regime i.e. aquifers, streams, high recharge areas and surrounding groundwater users and water quality for the construction operation and post closure phases;
- Description of groundwater management measures related to project phases;
- Groundwater monitoring protocols and a report containing groundwater monitoring data and analysis;
- A groundwater model illustrating the above mentioned analysis will be required;
- Provide a groundwater level contour map of the area; and
- A report with the findings and recommendations in which the alternatives will be prioritized based on the results of the study.

ToR: Wetland Delineation

A wetland delineation investigation will be conducted for the Kusile railway project. The objectives of this study will be:

- Review existing information available;
- An aerial photographic study to assess the accessibility, vegetation cover, drainage lines, slope aspects and percentage outcrop of each of the three routes;
- A field visit to delineate the wetlands according to the Department of Water Affairs (DWA) methodology;
- The wetlands should be clearly demarcated with provision of co-ordinates or demarcation of polygons;

- Identify impacts associated with the proposed development on the wetlands and provide mitigation measures for the identified impacts;
- A map will be compiled of each of the alternative routes, indicating the features observed; and
- A report will be compiled, in which the alternatives will be prioritized based on the results of the study.

ToR: Traffic Impact Assessment

A traffic impact assessment will be conducted for the Kusile railway project. The objectives of this study will be:

- Undertake a site visit, taking cognisance of the three identified alternatives in the study area;
- Undertake a review of existing information and conceptual plans of the study area;
- Determine the existing and predicted traffic impact during and after construction of the railway and assess the general impact of the project on traffic.
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- Provide a traffic impact report in which the alternatives will be prioritized based on the results of the study.

ToR: Air Quality Assessment

An air quality impact assessment will be conducted for the Kusile railway project. The objectives of this study will be:

- To assess impacts on the air quality during the construction and operational phases of the project;
- Quantify emissions from the construction operations and operational phase using US-EPA emission factors based on the process description and information available. The dispersion model (i.e. AERMOD) will be applied;
- Simulate ambient air pollutant concentrations for short-term impacts (i.e. highest hourly average), with extrapolations to long-term exposures (i.e. annual averages);
- Comparison emissions with ambient air quality guidelines/standards/goals and dose-response thresholds;
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- Compile an air impact assessment report in which alternatives are prioritised based on the findings of the study.

ToR: Noise Impact Assessment

A noise impact assessment will be conducted for the Kusile railway project. The objectives of this study will be:

- To assess the impact of the construction and operation of a railway on the existing ambient noise climate of the area;
- Take noise measurements on site to confirm the baseline noise levels in the area and compare typical noise levels for this type of construction and operation;
- Determine the expected response from the community and all other receptors (e.g. livestock) to the noise impact, i.e. the change in ambient noise of the area taking into account sociological factors as well as the noise climate based on the relevant SANS document.
- Reflect on input from traffic impact during construction and operation of the development;
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- Determine details of planned operations (when train will run etc.);
- A noise impact assessment report in which alternatives are prioritised based on the findings of the study.

ToR: Geotechnical Investigations

A Geotechnical Investigation is required to be conducted in the area and for the three alternative routes. The following is required:

- Review of existing and available geological and geotechnical information;
- A site visit to verify all aerial photographs and to investigate the depth and properties of regolith which will be judged by assessing natural exposure (dongas) and with the aid of hand augering where applicable;
- A map will be compiled of each alternative route, indicating features observed;
- Identify and assess significance of potential geotechnical constraints to the proposed development on all alternatives;
- Propose mitigation measures that could reduce or eliminate the identified constraints; and
- A short report will be compiled, in which alternatives are prioritised based on the findings of the study.

ToR: Social Impact Assessment

A Social Impact Assessment (SIA) is required to be conducted in the area and for the three alternative routes. The following is required:

- Undertaking of a social analysis including a social baseline study describing the socio – economic characteristics of the area;
- Identify relevant social aspects and predict the anticipated social as well as socio-economic changes and impacts associated with the proposed project;
- Assess positive and negative social impacts including identification of viable mitigation measures and project related benefits; and
- Compile a Social Impact Assessment Report indicating findings, recommendations and maps indicating sensitive and/or no-go areas as well as the preferred alternative.

ToR: Terrestrial Ecology and Avi-fauna

A terrestrial ecological and avifauna investigation will be conducted on the Kusile railway project. The objectives of this study will be:

- Review existing ecological information available;
- Conduct a site visit to determine the general ecological state of the proposed site, determine the occurrence of any red data and vulnerable species;
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- Provide a ranking assessment of the suitability of the three proposed alternative routes;
- Compile a terrestrial ecological and avi-fauna report, indicating findings, recommendations and maps indicating sensitive and/or no-go areas.

ToR: Aquatic Ecology

An aquatic ecological investigation will be conducted on the Kusile railway project. The objectives of this study will be to:

- Characterize the biotic integrity of aquatic ecosystems associated with the three proposed rail alternatives;
- Evaluate of the extent of site-related effects in terms of selected ecological indicators;
- Identify potential problems and recommend suitable mitigation measures;
- Identify listed aquatic biota based on the latest IUCN rankings, or other pertinent conservation ranking bodies;

- Identify sensitive or unique aquatic habitats which could suffer irreplaceable loss; and
- Compile an aquatic ecological report, indicating findings, recommendations and maps indicating sensitive and/or no-go areas.

ToR: Visual Assessment

A Visual Assessment will be conducted on the Kusile railway project. Specific objectives of this study will be:

- Desktop study (consulting existing and appropriate literature);
- Site visit of the project area if required;
- Assess the visual impact of the proposed development on each of the three alternative routes;
- Suggest any recommendation / mitigation measures that can be done to decrease the impacts of the proposed development;
- Provide a ranking assessment of the suitability of the three proposed alternative routes; and
- Compile a visual assessment report, indicating findings, fatal flaws, recommendations and maps indicating sensitive and/or no-go areas.

ToR: Risk assessment

A Risk Assessment will be conducted on the Kusile railway project. Specific objectives of this study will be to:

- Describe possible major incidents associated with this development, if any;
- Provide an estimate of the probability of such major incidents;
- Describe the potential effects of such a major incident on the public and residential areas;
- Compile an assessment of the risks associated with the proposed development;
- Describe mitigation measures that could reduce or eliminate the risks;
- Provide a ranking assessment of the suitability of the three proposed alternative routes; and
- Compile a Risk Assessment Report, indicating findings and recommendations.

7.1.3 Impact Analysis

The significance (quantification) of potential environmental impacts identified during scoping and identified during the specialist investigations will be determined using a ranking scale, based on the following:

- Occurrence
  - Probability of occurrence (how likely is it that the impact may occur?), and
  - Duration of occurrence (how long may it last?)
- Severity
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

Each of these factors has been assessed for each potential impact using the following ranking scales:

Probability: 5 – Definite/don't know 4 – Highly probable 3 – Medium probability 2 – Low probability 1 – Improbable 0 – None	***Duration***: 5 – Permanent 4 - Long-term (ceases with the operational life) 3 - Medium-term (5-15 years) 2 - Short-term (0-5 years) 1 – Immediate
Scale: 5 – International 4 – National 3 – Regional 2 – Local 1 – Site only 0 – None	***Magnitude***: 10 - Very high/don't know 8 – High 6 – Moderate 4 – Low 2 – Minor

The environmental significance of each potential impact was assessed using the following formula:

Significance Points (SP) = (Magnitude + Duration + Scale) x Probability

The maximum value is 100 Significance Points (SP). Potential environmental impacts were rated as high, moderate or low significance on the following basis:

- More than 60 significance points indicates high environmental significance.
- Between 30 and 60 significance points indicates moderate environmental significance.
- Less than 30 significance points indicates low environmental significance.

7.1.4 Draft EIA Report and EMP

Findings and/or recommendations of the specialist studies will be integrated into a report that will be updated as comments are received from I&APs. The Final EIA report together with a draft construction and operation EMP will be submitted to DEA for environmental authorisation.

7.2 Public Participation

The public participation process for the EIA will involve the following proposed steps:

- Announcement of the availability and public review of the draft Environmental Impact Report;
- Announcement of the availability of the final Environmental Impact Report;
- Holding of public and focus group meetings; and
- Notification of the authorities' decision with regard to Environmental Authorisation.

Information about each step is provided below.

7.2.1 Announcing the availability of the Draft EIR and EMP

At this point, specialist assessments would have been conducted and the Draft EIR and EMP would be ready for public review. A letter will be circulated to all registered I&APs, informing them of progress made with the study and that the Draft EIR and EMP are available for comment. The report will be distributed to public places and also presented at a stakeholder workshop / open house.

7.2.2 Public review of Draft EIR and EMP

The EIA Guidelines specify that stakeholders must have the opportunity to verify that their issues have been captured and assessed before the EIA Report will be approved. The findings of the specialist assessments will be integrated into the Draft EIR. The report will be written in a way accessible to stakeholders in terms of language level and general coherence. The Draft EIR will have a comprehensive project description, motivation, and description of alternatives considered and also the findings of the assessment and recommended mitigation measures. It will further include the Issues and Responses Report, which will list every issue raised, with an indication of where the issue was dealt with in the EIR. The findings of the assessment and recommended mitigation measures will also be incorporated into the EIR.

As part of the process to review the Draft EIR and EMP, stakeholder workshops with an open house component will be arranged to afford stakeholders the opportunity to obtain first-hand information from the project team members and also to discuss their issues and concerns.

Contributions at this meeting will be considered in the Final EIR. It is proposed that the same public places be used as in the scoping phase and also that stakeholder meeting be conducted at the same venues as during scoping.

7.2.3 Announcing the availability of the Final EIR and EMP

After comments from I&APs have been incorporated, all stakeholders on the database will receive a personalised letter to report on where we are in the process, to thank those who commented to date and to inform them that the Final EIR and EMP have been submitted to the lead authority for consideration.

7.2.4 Announce authorities' decision on Environmental Authorisation

Based on the contributions by the stakeholders, the decision of the authorities may be advertised through the following methods:

- Personalised letters to individuals and organisations on the mailing list;
- Advert in local or regional newspapers.

8 CONCLUSION AND WAY FORWARD

Eskom appointed Zitholele Consulting to undertake the EIA for the proposed Kusile railway and associated infrastructure project. This Scoping study has been undertaken with the aim of investigating potential impacts both positive and negative on the biophysical environment and identifying issues, concerns and queries from I&APs. The Scoping report documents the process followed, the findings and recommendations of the Scoping study, and the proposed Plan of Study for the EIA Phase to follow.

The way forward recommended by this study is as follows:

- Upon approval of the Scoping Report all participating stakeholders are to be notified of the conditions of the relevant authority for proceeding with the EIA;
- Amend the Plan of Study as required by conditions recommended by the relevant authority; and
- Execute the Plan of Study for the EIA phase of the project.

ZITHOLELE CONSULTING (PTY) LTD

Jacqui Hex Konrad Kruger

Appendix A: EAP CV

Appendix B: EIA Application Form and DEA acceptance letter

Appendix C: Landowner Consent Forms

Appendix D: Newspaper Advertisements and Site Notices

Appendix E: Project Location Map

Appendix F: I&AP Database

Appendix G: Issues and Response Report

Appendix H: Background Information Document

Appendix I: Comments to date from I&APs (including minutes)

Appendix J: SANS 3000-1 Standards

Appendix K: Plan of Study for EIA