mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING.

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: New Kleinfontein Goldmine (Proprietary) Limited

TEL NO: 011 726 1047

FAX NO: 011 726 1087

POSTAL ADDRESS: P.O. Box 262, Petersfield, Springs, 1566

PHYSICAL ADDRESS: Corner, Cloverfield and Outeniqua Road, Eastvale, Springs, Gauteng

FILE REFERENCE NUMBER SAMRAD: GP 182 MRC

IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out

below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE SCOPING PROCESS

1) THE OBJECTIVE OF THE SCOPING PROCESS IS TO, THROUGH A CONSULTATIVE PROCESS—

(a) identify the relevant policies and legislation relevant to the activity;
(b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
(c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
(d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
(e) identify the key issues to be addressed in the assessment phase;
(f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
(g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

———————

SCOPING REPORT

2) CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of the EAP who prepared the report

Name of Environmental Assessment Practitioners	Prime Resources (Pty) Ltd
Physical Address:	70 - 7th Avenue, Parktown North, Johannesburg
Postal Address:	PO Box 2316, Parklands, 2121
Telephone Number:	011 447 4888
Fax Number:	011 447 0355
Email:	prime@resources.co.za
Professional Affiliations:	PrEng; PrSciNat, SAIMM

b) Expertise of the EAP

i) The qualifications of the EAP (With evidence attached as Appendix 1)

Prime Resources (Pty) Ltd is a specialist environmental consulting firm providing environmental, social, and related services, which was established in 2003. Prime Resources was founded by Peter Theron (PrEng, SAIMM), the Managing Director and Principal Environmental Consultant of the firm. Peter has a GDE Environmental Engineering from the University of Witwatersrand and over 27 years' experience in the field of environmental science and engineering.

Gené Main (Pr.Sci.Nat, Environmental Science), the Project Manager and Principal Scientist for the proposed project, has a M.Sc. (Botany) from the University of the Western Cape and eight years' experience in the field of environmental science.

Amanda Mooney, an environmental scientist, has a M.Sc. (Zoology) and a M.Sc. (Environmental Management) from the University of Johannesburg and three years' experience in the field of environmental science.

Louise Jones, an environmental scientist, has a M.Sc. (Environmental Science) from the University of Witwatersrand and two years' experience in the field of environmental science.

Key Prime Resources Personnel CVs are attached as Appendix 1.

ii) Summary of the EAP's past experience

A copy of the Prime Resources Company Profile is attached as Appendix 2.

3) DESCRIPTION OF THE PROPERTY

Farm Name:	Holfontein 71 IR, Ptn 68 and RE
Application area (Ha)	17.66 ha
Magisterial district:	Ekurhuleni Metropolitan Municipality
Distance and direction from nearest town	Welgedacht located 1.5 km south-west
21 digit Surveyor General Code for each farm portion	T0IR00000000007100000 T0IR00000000007100068

a) Locality map (show nearest town, scale not smaller than 1:250000)

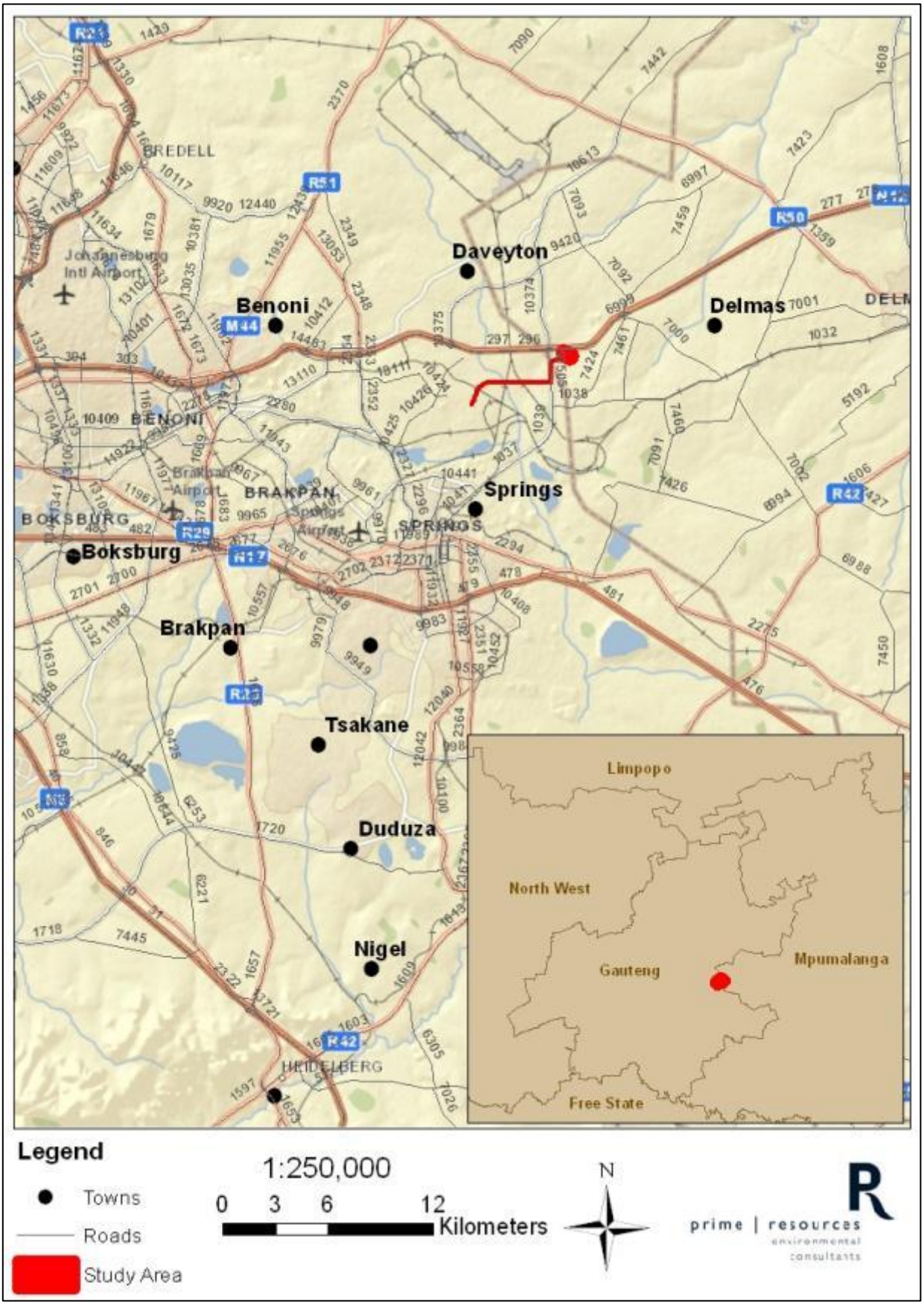


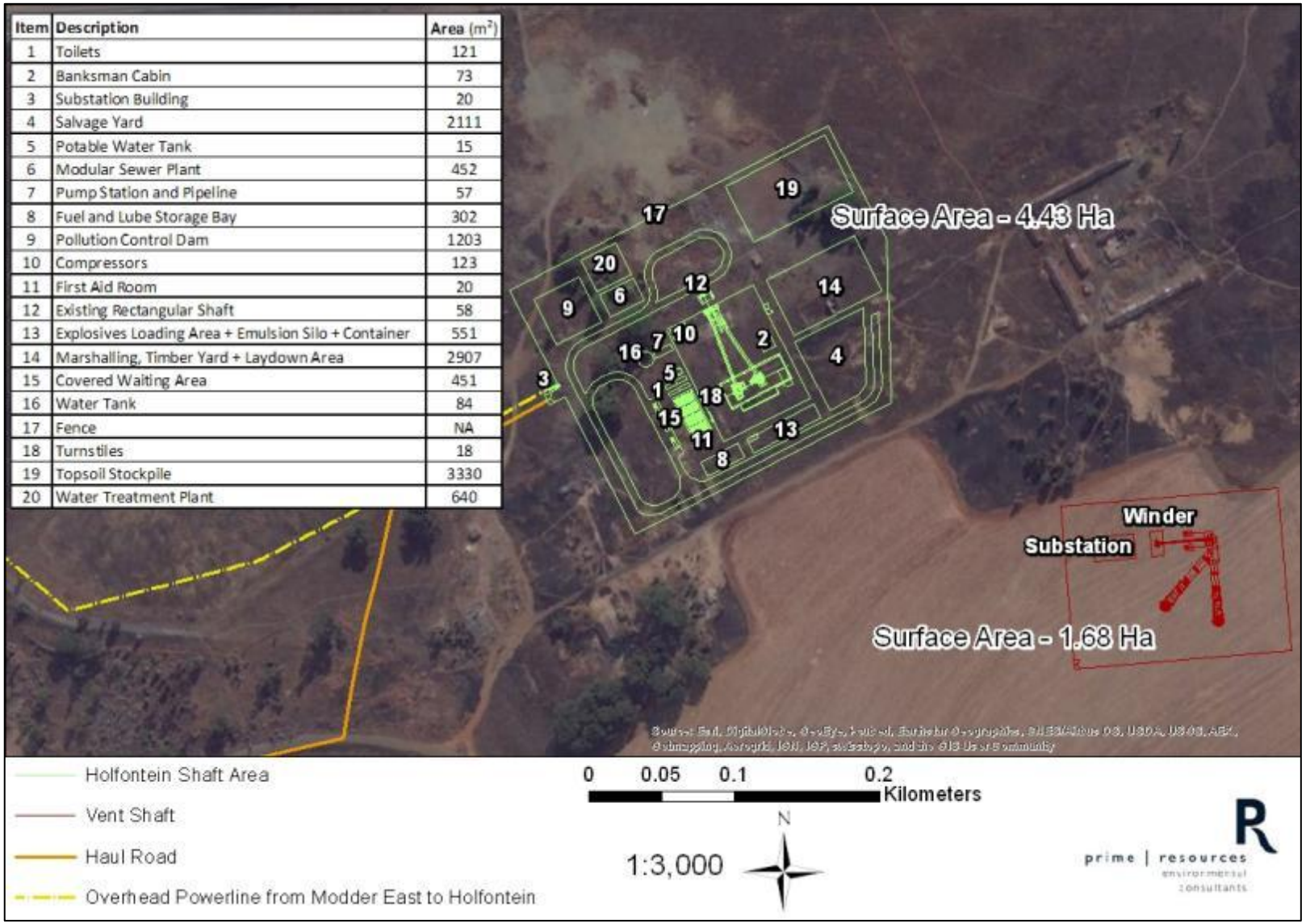
Figure 1: The Holfontein Project locality map

4) DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

a) Listed and specified activities **(Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site –** refer to Figure 2**)**

ME OF ACTIVITY (All activities including activities not listed) **.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**	**rial extent of the Activity** **or m²**	**LISTED ACTIVITY** **Mark with an X where applicable or affected.**	**PPLICABLE LISTING NOTICE**
Refurbishing of the existing Holfontein shaft (headgear, two winders, skip, ore storage bin, chute)	*	**X**	GNR984 – Activity No. 17
Ventilation shaft, fan and second emergency outlet, winder and substation	*		
Turnstiles (employee access system) and lamp room	*		
Containerised office, first aid room, ablutions and covered waiting area	*		
Modular sewage treatment plant (30 m^3 per day capacity)	*		
Portable water treatment facility (640 m^2)	*		
Salvage yard and waste transfer area (hard-standing impermeable bunded area with a roof and sump)	*		
Diesel storage tank (23 m^3)	*		
Explosives loading area, emulsion silo and container	*		
Haul route to existing Modder East operations (6.2 km in length, 6.4 m wide, road reserve of 30 m)	**	**X**	GNR983 – Activity No. 24
On site roads will be up to 8 m wide to facilitate turning of haul trucks	**		
A low level crossing of the Blesbokspruit and associated floodplain wetland	**	**X**	GNR983 – Activity No. 12 and No. 19 GNR984 – Activity No. 24
Power lines from existing Modder East operations (two 6 MVA lines)	*		
Potable water storage tanks (200 ℓ)			
Pollution control dam (40 m x 40 m)	*		
Water settling tanks (for underground water) (12 m diameter)	*		
Surface infrastructure area and ventilation shaft area where the above listed infrastructure components are to be located.	6.11 ha (encompasses all items marked with * above)	**X**	GNR983 – Activity No. 27 GNR985 – Activity No. 12

Roads, power lines and associated servitudes	11.55 ha (encompasses all items marked with ** above)		
Dewatering of groundwater – will require a Water Use Licence		**X**	GNR984 – Activity No. 6
Expansion/upgrade of the culvert/crossing of the Blesbokspruit – will require a Water Use Licence			
Pollution Control Dam – will require a Water Use Licence			
Excess water storage containers providing interim holding and settling capacity for underground water – will require a Water Use Licence			
Dust suppression on unpaved portions of the haul road – will require a Water Use Licence			
Sewage treatment plant - will require a Water Use Licence			
Discharge of underground water to a tributary of the Blesbokspruit will require a Water Use Licence			
Portable water treatment facility - will require a Water Use Licence			



Item	Description	Area (m^2)
1	Toilets	121
2	Banksman Cabin	73
3	Substation Building	20
4	Salvage Yard	2111
5	Potable Water Tank	15
6	Modular Sewer Plant	452
7	Pump Station and Pipeline	57
8	Fuel and Lube Storage Bay	302
9	Pollution Control Dam	1203
10	Compressors	123
11	First Aid Room	20
12	Existing Rectangular Shaft	58
13	Explosives Loading Area + Emulsion Silo + Container	551
14	Marshalling, Timber Yard + Laydown Area	2907
15	Covered Waiting Area	451
16	Water Tank	84
17	Fence	NA
18	Turnstiles	18
19	Topsoil Stockpile	3330
20	Water Treatment Plant	640

Figure 2: Preferred initial site layout

b) Description of the activities to be undertaken (Describe Methodology or technology to be employed, and for a linear activity, a description of the route of the activity)

Mining

The purpose of the Holfontein Project is to supplement the drop in production once the New Kleinfontein Goldmine [Modder East (ME) operations] tonnage profile begins to decline. The Life of Mine (LoM) schedule for the Holfontein Project has been incorporated into the ME operations LoM.

The Holfontein Project ore body is a shallow dipping reef (Main Reef) of 7 degrees from a depth below surface of 363 m to 645 m below surface. The ore body extends for about 2 300 m on dip and ranges from 170 m to 1 400 m on strike. The underground extent for mining at the Holfontein Project is 126 ha and the above ground extent required for infrastructure, roads, servitudes etc. at the Holfontein Project is 17.66 ha.

The LoM will consist of two years of construction and development, and 8 years of gold production. A further 6 months to a year is assumed for decommissioning and closure.

The Holfontein Project has an existing shaft that was closed / sealed in the early 1940's. In order to refurbish this shaft, the shaft will initially be dewatered and the shaft will re-equipped. Re-equipping of the existing Holfontein shaft will take approximately 20 months. The slyping of the existing decline and the development of a new on-reef decline parallel to the existing excavation, at 80 m per month, will create the main arterial connecting the workings to the shaft.

Production at the Holfontein Project is planned to begin in 2021 and contribute approximately 130 000 tonnes per annum in the first three years. Holfontein will be at steady state production of 380 000 tonnes per year (30 000 tonnes per month) between 2024 and 2028. Year 2028 will be the final year of operation and is expected to produce 312 000 tonnes.

After the operations are finalised, decommissioning will commence. All shafts will be sealed; all surface infrastructure will be dismantled and removed; and all disturbed areas will be ripped, covered with a layer of topsoil and returned as closely as possible to the present state.

Surface infrastructure and services

The areas where surface infrastructure and access roads are to be located will be cleared and the topsoil stripped and stockpiled (4 417.2 m^2).

The mine will be operated as a section of ME operations with all services and support being provided by ME. Mining is conventional stoping with trackless access. The development will all be on reef. Primary access will be by means of the re-equipped Holfontein shaft. Overburden and ore will be hoisted through the shaft and transported to ME operations by road.

The shaft will consist of a steel headgear, with two winders (between 40 to 50 m in height), to be constructed above the existing rectangular shaft that will operate 24 hours a day on the main shaft, hoisting men, material and ore. Men and material will use the shaft for both day and night shift. Rock hoisting will be limited to a 12 hour day shift to limit the noise associated with tipping and trucking of ore. Hoisting will take place 23 days a month at 1 200 tonnes per day. The skip (5 tonne capacity) will tip every 2 minutes into a concrete bin (200 tonne capacity). The bin will discharge into trucks below the ambient ground level. At steady state production a truck will load every 15 minutes.

Loading will be by chute and will not require a front end loader. The material loaded will be wet therefore dust will be limited. There will be a trucking loop to avoid trucks having to reverse.

Fuel Storage

A bunded area on surface will contain a fuel storage tank (23 m^3 capacity). Diesel will be supplied by tanker. Fuel will be piped down the shaft to an underground storage area. Lubricants will be stored at ME operations, transported to site, and taken directly underground in containers.

Explosives

Explosives will be stored at ME operations and brought to site as required. There will be an explosives loading area, emulsion silo and container on site at the Holfontein Project.

Electricity

Electrical power will be sourced from ME operations. Two 6 MVA lines, approximately 5.5 m in height and 6.3 m in height across roads and railways will be constructed between ME operations and the proposed substation building at the Holfontein Project adjacent to the proposed ventilation shaft.

Water

Potable water at the containerised office and ablutions will be trucked from ME operations and stored in a potable water storage container.

Excess groundwater produced at Holfontein will be pumped to above-ground storage tanks and settled, after which it will be pumped to a portable water treatment facility and discharged to the Holfontein Stream.

All dirty water from the dirty water catchment (entire surface infrastructure area) will be diverted to a Pollution Control Dam (1 600 m^2).

Waste

A salvage yard, timber yard and laydown area will also be constructed on site. There will also be a designated area for the temporary storage of waste, which will be collected, separated and disposed of at a licensed landfill facility. The waste storage area will be bunded, have an impermeable surface, have a sump, and will be covered with a roof.

Non-hazardous domestic and industrial waste comprises typical constituents such as paper/cardboard, empty cans, glass, steel and plastic containers, scrap metal, builder's rubble, piping and tubing (plastic, metal and rubber), timber, batteries and tyres. Some industrial waste produced on site will be hazardous. This will include used oil, degreasers, lubricants and containers in which these were stored.

The volumes applicable to the identified waste stream will fluctuate with the requirements of the mine. There will be no long term storage of any waste materials on site.

Sewage

Containerised toilets will be provided (3 x Male and 1 x Female) (9 m x 3 m containers) on surface. A modular sewage treatment plant (30 kℓ per day) will be installed. The effluent will be pumped to the portable water treatment facility and discharged to the Holfontein Stream. All brine will disposed of at a licensed landfill facility.

Hauling

All overburden and ore will be transported from the Holfontein Project to ME operations plant by road using conventional 30 tonne road trucks. The estimated hauling cycle (i.e. return trip) time between the Holfontein Project and the ME plant for a 30 tonne road truck is 30 minutes. Two trucks will operate for 12 hours a day during daylight hours.

The haul route consists of 3 km of existing gravel road and 3 km of existing tarmac surface. The gravel portion will need to be upgraded but will be no wider than 6.4 m. The gravel road within the shaft area will be up to 8 m wide to facilitate turning with tighter radii.

Ventilation

A ventilation shaft (± 30 m in height) will be constructed. The main fan arrangement will consist of a single fan station on surface at the top of the upcast shaft. The fan station will be equipped with 2 axial fans with adjustable blades operated in parallel. The ventilation shaft will be equipped with a small headgear for purposes of emergency evacuation. The headgear will also be used weekly for shaft inspection.

A compressor will be situated on surface to supply air to the underground refuge bays, and will run continuously.

Staff

Employees will be sourced from the existing ME operations. No new employment opportunities will be created. Mine employees will be transported by bus from ME operations, where there are existing change rooms etc. There will be two 9 hour shifts per day. A covered waiting area on surface will be able to accommodate 400 employees (the estimated staff complement per shift). The entire infrastructure area will be fenced off and the employees will enter and exit at the eight turnstiles. A first aid room, office (9 m x 3 m containers) lamp room, and a banksman cabin will also be located on surface.

5) POLICY AND LEGISLATIVE CONTEXT

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instructions that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED**
The Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is the key legislation governing mining activities within South Africa. It details the requirements and processes which need to be followed and adhered to by mining companies. The Department of Mineral Resources (DMR) is the competent authority that deals with all mining related applications. An application for an EMPr amendment in terms of Section 102 of the MPRDA was submitted to the DMR on 9 June 2015, through the SAMRAD online system, to incorporate the Holfontein Prospecting Right Area into the existing New Kleinfontein Goldmine (DMR Ref. PWV 5/3/2/987 and PWV 6/2/2/1136). The DMR accepted the application on (*awaiting acceptance).*	An integrated application in terms of the MPRDA and NEMA is being undertaken. The NEMA process for the proposed Holfontein Project is described below.
The National Environmental Management Act, No. 107 of 1998 (NEMA) is enabling legislation intended to provide a framework for integrating environmental management into all developmental activities to promote co-operative environmental governance with regard to decision making by state organs on matters affecting the environment. The EIA Regulations of GNR982, December 2014 serve to regulate the procedure and criteria for submitting, processing and considering decisions for applications for environmental authorisation in order to avoid the commencement of activities which may have a detrimental impact on the environment. These Regulations provide details on the process to be followed for the consultation of stakeholders and IAPs, the identification of the Competent Authority, and the various timeframes and application requirements for environmental authorisation. A further three Regulations, GNR983, GNR984, and GNR985 (all of 2014), provide lists of activities for which environmental authorisation, either in the form of a Basic Assessment or Scoping and EIAR / EMPr, is required before the activity can commence. In instances where Environmental Authorisation is required for a mining project, in terms of the MPRDA as well	This Scoping Report has been prepared to meet the requirements of the EIA Regulations (GNR982 of 2014). Refer to Section 4)a) for the listed activities applicable to the proposed Holfontein Project.

as NEMA, the DMR is identified as the Competent Authority. An application for Environmental Authorisation in terms of Section 24 of NEMA was submitted on 9 June 2015 to the DMR for the NEMA listed activities triggered by the proposed Holfontein Project (refer to Section 4). The application was submitted to the DMR on 9 June 2015 (*awaiting acceptance)*. According to the EIA Regulations (2014) the following are to be submitted in support of the application for Environmental Authorisation: • Scoping Report together with the results of consultation with Interested and Affected Parties (IAPs) and State Departments, to be submitted to the Competent Authority on or before 24 July 2015 (this document); • EIAR and EMPr together with the results of consultation with IAPs and State Departments on or before 10 November 2015.	
The National Environmental Management Air Quality Act, No. 39 of 2004 (NEMAQA) has placed the responsibility for air quality management on local authorities that will be tasked with baseline characterisation, management and operation of ambient monitoring networks, licensing of listed activities, and emissions reduction strategies. GN893 of 2013 provides the list of activities in terms of Section 21(1)(a) for which licensing is required in terms of Chapter 5 of the Act. This notice further establishes minimum emission standards for the listed activities. <u>None of the activities in terms of the above schedule will be triggered by the proposed Holfontein Project.</u> The ambient air quality standards (GN1210 of 2009) were determined based on international best practice for PM_{10} (particulates with an aerodynamic diameter of 10 micron), dust-fall, sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), carbon monoxide (CO), lead (Pb), benzene and recently $PM_{2.5.}$ The $PM_{2.5}$ standards were published in GN486 of 2012. Section 32 of NEMAQA allows for the promulgation of measures to control and monitor dust. The National Dust Control Regulations (GNR827 of 2013) prescribe general measures for the control of dust in all areas, including residential and light commercial areas. Section 33 of NEMAQA relates to rehabilitation of mining operations, which states that an Applicant must notify the minister five years prior to mine closure of the planned closure and provide a closure and rehabilitation plan for the prevention of pollution of the atmosphere by dust after operations have ceased. <u>Provision for this will be made in the interim closure plan.</u>	Refer to Section 11)a)i) for a detailed description of the ambient air quality within the proposed Holfontein Project area; refer to Section 11)c) for the potential impacts on ambient air and Section 11)c)iii) for potential mitigation. Also refer to Section 12)c) for the plan of study, including specialist air quality assessment, for the EIA phase. Air quality management will be addressed in the EMPr.

Air quality monitoring and management measures will be stipulated in the EMPr, to ensure that the Applicant complies with the above legislative requirements, following a specialist study to determine the likely impacts to air quality resulting from the proposed activities at the Holfontein Project.	
The National Heritage Resources Act, No. 25 of 1999 (NHRA) serves to protect and manage South African heritage and cultural resources, which include places, buildings, structures and equipment of cultural significance, historical settlements and townscapes, archaeological and paleontological sites, graves and burial grounds. The Act protects any heritage resources from damage by developments by stipulating in Section 38 that any person intending on undertaking any form of development which involves the activities listed below must, at the earliest stage of initiation, notify the South African Heritage Resources Association (SAHRA): A. the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length; B. the construction of a bridge or similar structure exceeding 50 m in length; C. any development or other activity which will change the character of a site— i. exceeding 5 000 m^2 in extent; or ii. involving three or more existing erven or subdivisions thereof; or iii. involving three or more erven or divisions thereof which have been consolidated within the past five years; or iv. the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority; D. the re-zoning of a site exceeding 10 000 m^2 in extent; or E. any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority. Of the activities listed above, items A and C (i) are triggered by the Holfontein Project. 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 NEMA and the EIA process, there is no need to undertake a separate application in terms of the NHRA. Heritage considerations will form part of this environmental process. In terms of the requirements of the NHRA, a specialist cultural and heritage consultant was appointed to conduct an assessment of the area. <u>No findings of cultural and heritage significance were made within the proposed project site.</u>	Refer to Section 11)a)ii) for a detailed description of the cultural and heritage resources within the Holfontein Project area; refer to Section 11)c) for the potential impacts on these resources and Section 11)c)iii) for potential mitigation. Cultural and heritage resource management will be addressed in the EMPr.

Findings were made in the surrounding area and mitigation measures for potential indirect impacts on these resources will be included in the EMPr.

The National Water Act, No. 36 of 1998 (NWA) regulates all matters relating to inland water resources. It thus operates as a management instrument with the lead authority being the Department of Water and Sanitation (DWS). This Act provides mechanisms for the prevention of the pollution of water resources to support the management of water as a renewable resource. Section 21 of the Act lists water uses for which authorisation is required from the DWS, while Section 39 identifies several water uses where the need for a licence is dispensed with. The use of water for which a licence is not required is also described.

Regulation GN704 of 1999 provides regulations for the use of water for mining and related activities and is aimed to further protect water resources. These regulations describe how mining activities should be managed to protect water resources. The Act thus plays a crucial role in the mining process as many mining-related activities use water as listed in Section 21, thereby requiring approval from DWS.

A pre-application consultation meeting was held with the local catchment office of the DWS on 27 May 2015 at the DWS offices in Pretoria (refer to Appendix 6.2 for the register and meeting minutes), wherein the potential water uses were discussed. The following water uses apply to the proposed Holfontein Project and will be included in the Water Use Licence Application (WULA):

SECTION 21	WATER USE	DESCRIPTION
A	Taking water from a water resource	• Dewatering of the underground workings and discharging the water to the Holfontein Stream after treatment.
J	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people	
C	Impeding or diverting the flow of water in a watercourse	• Expansion/upgrade of the culvert/crossing of the Blesbokspruit • Expansion/upgrade of the culvert/crossing of the tributary of the Blesbokspruit
I	Altering the bed, banks, course or characteristics of a watercourse	

Refer to Section 11)a)v) and Section 11)a)iv) for a detailed description of the surface and groundwater resources within the Holfontein Project area; refer to Section 11)c) for the potential impacts on water resources and Section 11)c)iii) for potential mitigation.

Also refer to Section 12)c) for the plan of study, including specialist assessment of impacts on water resources, for the EIA phase.

Water management will be addressed in the EMPr.

F	discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit	• Sewage effluent from the portable water treatment facility will be discharged to the Holfontein Stream together with the treated underground water.	
G	Disposing of a waste or waste water which may detrimentally impact on a water resource	• Pollution Control Dam will receive all dirty water runoff. • Excess water storage containers providing interim holding and settling capacity for underground water, prior to pumping to the portable water treatment facility. • Treated sewage effluent from the sewage plant will be pumped to the portable water treatment facility. • Dust suppression on unpaved potions of the haul road.	
The National Environmental Management Waste Act, No. 59 of 2008 (NEMWA) Act serves to reform the laws regulating waste management in order to protect public and environmental health by providing measures for the prevention of pollution and ecological degradation and to provide defining requirements for the licensing and control of waste management activities. GN921 of 2013 provides definitions for activities which require a waste management licence and identifies the relevant environmental authorisations which are further required for said activities. The Act also provides national norms and standards for the storage of waste above the licence thresholds (GN926 of 2013). The applicable activities at the mine include the temporary handling and transfer area for general and hazardous waste at the shaft, however, the Applicant intends to store less than 100 m^3 of general waste and less than 80 m^3 of hazardous waste at the transfer facilities at any given time, thereby remaining below the licence thresholds or if these thresholds are exceeded at any given time to ensure that waste is only temporarily stored (less than 90 days).			Waste management will be addressed in the EMPr.
The Hazardous Substances Act, No. 15 of 1973 aims to control substances that may cause injury, ill-health, or death through their toxic, corrosive, irritant, strongly sensitising or flammable nature, or by the generation of pressure. The Act provides for the division of such substances or products into groups in relation to the degree			Hazardous substance management will be addressed in the EMPr.

of danger as well as the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products. Hazardous materials such as explosives and hydrocarbons will be handled on site. The Applicant will ensure that any hazardous materials on site are handled in a manner in line with that described in the Act.	
The purpose of the **National Environmental Management: Biodiversity Act, No. 10 of 2004 (NEMBA)** is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. This includes: the protection of species and ecosystems; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; and the establishment of a South African National Biodiversity Institute (SANBI). Section 52 of the Act provides for listing of threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Protected. The main purpose of listing threatened ecosystems is to reduce the rate of ecosystem and species extinction and includes the prevention of further degradation and loss of structure, function and composition of threatened ecosystems. Threatened terrestrial ecosystems have been delineated based on the South African Vegetation Map, national forest types and priority areas identified in a provincial systematic biodiversity plan, in this case the Gauteng Conservation Plan (C-Plan). The proposed project site falls within ecosystems which are listed in terms of Section 52 of NEMBA. The proposed shaft and a portion of the haul road falls into the Blesbokspruit Highveld Grassland ecosystem which is currently listed as Critically Endangered, while the remainder of the haul road is located in the Soweto Highveld Grassland ecosystem which is currently listed as Vulnerable. According to the Gauteng C-Plan various areas which are associated with the Holfontein Project have been listed as Important due to the presence of suitable habitat for Red and Orange Listed plant species, Red Listed mammal species, Red Listed bird species as well as the presence of primary habitat. However, most of the proposed infrastructure falls within disturbed and transformed areas classified by independent specialists as having a low ecological sensitivity. Portions of the existing road to be used as the haul road are classified as having medium to high ecological sensitivity. Chapter 4, Part 2 of the Act provides for listing of species as threatened or protected. If a species is listed as threatened, it should be further classified as critically endangered, endangered or vulnerable (GNR151 of 2007).	Refer to the terrestrial ecology baseline in Section 11)a)ix) and the aquatic ecology baseline in Section 11)a)iii); refer to Section 11)c) for the potential impacts on biodiversity and Section 11)c)iii) for potential mitigation. Also refer to Section 12)c) for the plan of study, including specialist assessment of impacts on biodiversity, for the EIA phase. Biodiversity management will be addressed in the EMPr.

The Act also defines restricted activities in relation to a specimen of a listed threatened or protected species (GNR152 of 2007). Plant species of conservation concern within the area include *Hypoxis hemerocallidea* and *Kniphofia typhoides* (currently listed as Near Threatened), and *Crinum bulbispermum* (currently listed as Declining). If these plant species of conservation concern will be impacted, a permit for the removal and relocation of these species will have to be obtained from GDARD prior to the commencement of the activity. The grassland also provides suitable habitat for at least two mammal species of conservation concern namely *Atelerix frontalis* (South African Hedgehog; currently listed as Near Threatened), and *Leptialurus serval* (Serval; currently listed as Near Threatened). The moist grassland provides suitable habitat for mammal species of conservation concern such as *Leptailurus serval* (Serval; currently listed as Near Threatened) and *Dasymys incomtus* (African Marsh Rat; currently listed as Near Threatened) and the Blesbokspruit also supported healthy populations of the rare butterfly, *Metisella meninx* (Marsh Sylph).	
The Mine Health and Safety Act, No. 29 of 1996 as amended and the Regulations thereto provide for protection of the health and safety of employees and other persons at mines and, for that purpose to promote a culture of health and safety; to provide for the enforcement of health and safety measures; to provide for appropriate systems of employee, employer and State participation in health and safety matters; to establish representative tripartite institutions to review legislation, promote health and enhance properly targeted research; to provide for effective monitoring systems and inspections, investigations and inquiries to improve health and safety; to promote training and human resources development; to regulate employers' and employees' duties to identify hazards and eliminate, control and minimise the risk to health and safety; to entrench the right to refuse to work in dangerous conditions; and to give effect to the public international law obligations of the Republic relating to mining health and safety. The Applicant will ensure that operations on site are in line with the requirements of the Act and Regulations.	The commitment to abide by the requirements of the Mine Health and Safety Act, No. 29 of 1996 will be included in the EMPr.
The Gauteng Province Environmental Management Framework (2014) states that the project area is located in Zone 1, the intention of which is to streamline urban development activities in it and to promote development infill, densification and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.	This has been taken into consideration in the determining of the need and desirability of the project, refer to Section 6) and Appendix 3.
The Ekurhuleni Metropolitan Municipality (EMM) Integrated Development Plan (2013) provides the regional socio-economic context of the project area, which was used to inform the social baseline for the	Refer to the social baseline in Section 11)a)viii) This has also been taken into

Holfontein Project.	consideration in the determining of the need and desirability of the project, refer to Section 6) and Appendix 3.
According to **the EMM Built Environment Performance Plan (2014 -2015)**, the disadvantaged communities of Etwatwa and Daveyton are target areas for service upgrading, specifically with respect to transport networking and retail development. The Holfontein Project is located within close proximity to these communities.	Refer to the social baseline in Section 11)a)viii). This has also been taken into consideration in the determining of the need and desirability of the project, refer to Section 6) and Appendix 3.
The EMM Growth and Human Development Strategy (2025) indicates the objectives to be met by EMM regarding growth and human development by the year 2025. Objectives include: the provision of social and economic infrastructure and services that will build sustainable communities and contribute to halving poverty; accelerated, labour-absorbing economic growth that increases per annum and that will create long-term sustainable jobs and contribute to halving unemployment; sustainable development; enhanced government efficiency, co-operative governance; and deepening participatory democracy, provincial and national unity, as well as citizenship. The proposed project will contribute to the objective of decreasing unemployment as it will sustain the existing employment of ME employees for the production life of the Holfontein Project.	Refer to the social baseline in Section 11)a)viii). This has also been taken into consideration in the determining of the need and desirability of the project, refer to Section 6) and Appendix 3.
The Draft EMM Region C - Spatial Development Framework (2014) provides information regarding spatial characteristics of the project area. EMM has a diverse range of land use and land capability functions including industrial, agricultural and residential. The Holfontein Project falls within Region C. Much of EMM has been allocated to future development and similarly, although Region C appears to be undeveloped, the Spatial Development Framework indicates that much of Region C is largely allocated to future urban development and agriculture.	Refer to the social baseline in Section 11)a)viii). This has also been taken into consideration in the determining of the need and desirability of the project, refer to Section 6) and Appendix 3.
According to the **EMM Bioregional Plan (2014)** the Eastern Highveld Grassland and the Soweto Highveld Grassland ecosystems are not protected as less than 5% of the biodiversity targets are met within protected areas. Conservation targets have been aligned with the Gauteng C-Plan. However, through ground-truthing by the ecology specialist, it was determined that the proposed site has been transformed and has a low ecological sensitivity and is therefore does not contribute to conservation target areas.	This has been taken into consideration in the determining of the need and desirability of the project, refer to Section 6) and Appendix 3.

6) NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES **(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location)**

The Scoping Phase has thus far considered the majority of the aspects to adequately consider the "need and desirability". A detailed need and desirability report has been prepared according to the NEMA Need and Desirability Guideline (GN891 of 2014), and attached as Appendix 3. Any aspects which could not be addressed during the Scoping Phase, which mostly relates to impact assessment, will be addressed during the EIA Phase.

7) PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The authorisation will be for a period of approximately ten years from the year 2019 (construction and development) to the year 2029 (decommissioning and closure).

8) DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE **(NB!! – This section is not about the impact assessment itself; It is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.)**

A detailed site screening assessment was conducted and the report is attached as Appendix 4. The methodology applied to conduct site selection (site selection matrix) is described below:

Site screening was conducted through a ranking assessment and an assessment of potential impacts associated with each of the site alternatives. The scores from the ranking and impact assessments were totalled to determine the overall score for each site alternative. Total site scores are relative numbers that can only be used to make comparisons between sites to determine the most favourable site for the project. In the scoring matrix a site with many negative features and significant risks will score high. A more favourable site will have a relatively lower total site score. The site with the lowest total site score is thus the preferred site for the proposed project.

<u>Ranking assessment of the site alternatives</u>

In order to access the site alternatives, three main categories were identified (biophysical, social and technical) and various sub-criteria under the main categories were defined. The sub-criteria were assigned equal weightings. Scores were assigned to each sub-criterion, depending on the value or importance of each (i.e. Low - 1, Medium - 2 and High - 3). Each site was then assessed and given a score in terms of the sub-criteria. The scores for each site were summed to give a total score for the ranking assessment.

<u>Impact assessment of potential impacts associated with the site alternatives</u>

The impact assessment methodology encompassed an assessment of the nature, extent, duration, probability and significance of the identified potential impacts of the mining operation at each of the

site alternatives. The significance of both positive and negative potential impacts were determined through the evaluation of impact consequence and likelihood of occurrence.

Stakeholder engagement did not form part of the initial site screening assessment.

9) DETAILS OF ALL ALTERNATIVES CONSIDERED (With reference to the site plan and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) the property on which or location where it is proposed to undertake the activity;

(b) the type of activity to be undertaken;

(c) the design or layout of the activity;

(d) the technology to be used in the activity;

(e) the operational aspects of the activity; and

(f) the option of not implementing the activity.)

a) Site Alternatives

A detailed site screening assessment was conducted (attached as Appendix 4). The outcomes of the detailed site screening assessment are summarised below:

Three potential sites, for the location of the vertical shaft required to access the mineral resources which have been identified to the north of the existing Modder East Operations and which fall within New Kleinfontein Goldmine Mining Right and / or Prospecting Right areas, were identified within 6 km of the existing Modder East Operations. See Figure 3 for the approximate positions of the three alternative sites.

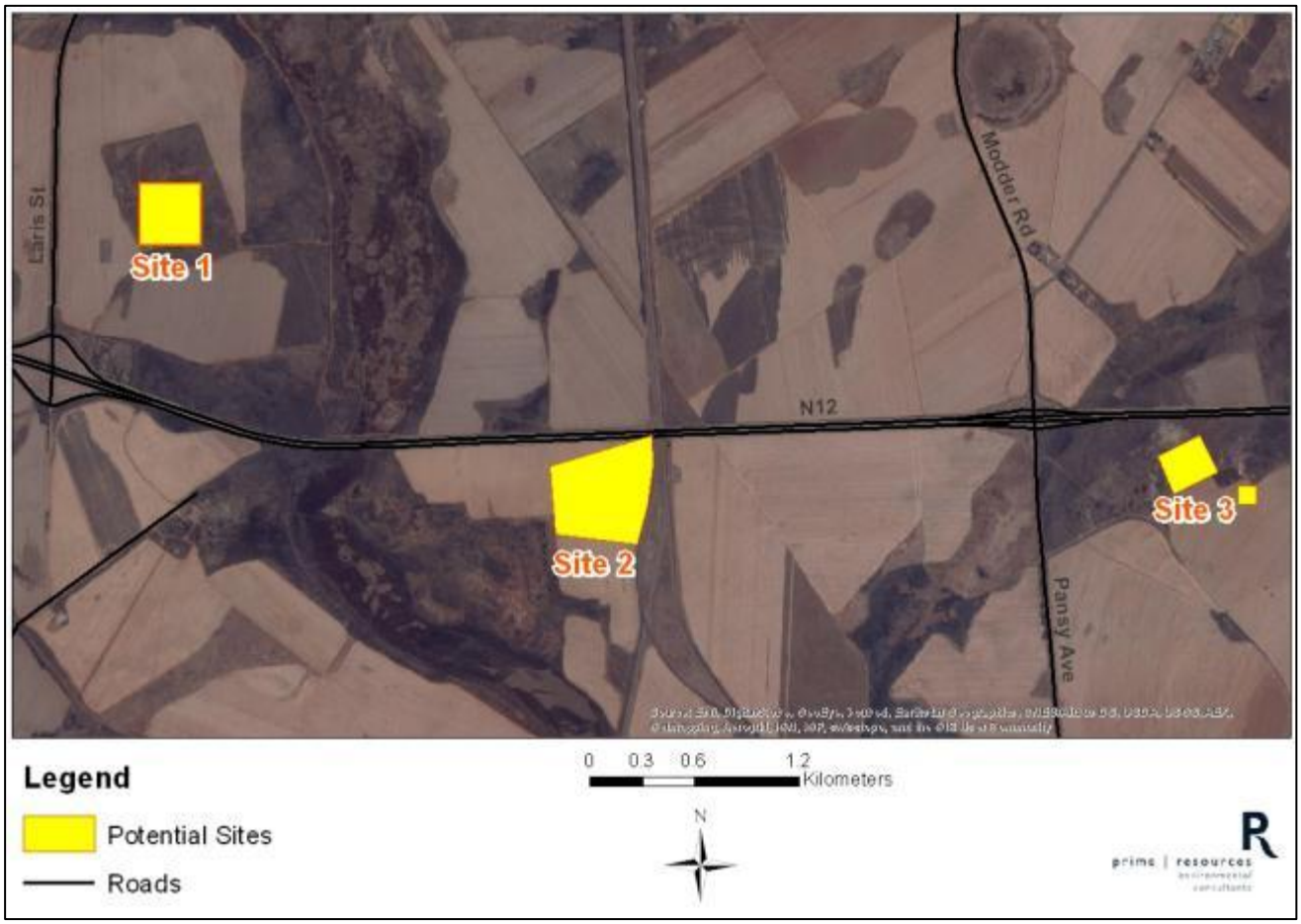


Figure 3: Location of Site Alternatives considered for the proposed project

From this site screening report and the site selection process followed it can be concluded that, despite the influences of the various categories, Site 3 emerges as the preferred project site which has been and will be assessed going forward in the Scoping and EIA processes.

b) Type of Activity

There are no alternatives to the activity (underground mining) as this is determined by the depth of the mineral resource to be targeted.

c) Design and Layout Alternatives

Initial baseline specialist studies were undertaken and informed the layout alternative selection. The significance of the potential impacts of the alternatives was assessed using the Prime Resources Impact Assessment Methodology detailed in Section 11)c)i). The following alternatives were considered:

i) Access Route Alternatives

Two alternatives were considered for access to the proposed surface infrastructure site (refer to Figure 4). Both alternatives were limited as much as possible to existing tracks and roads to avoid disturbing additional areas.

The preferred alternative (red in Figure 4) was selected in order to limit, where possible, impacts of dust, noise and vehicle safety hazards at the residential dwellings en route to the existing shaft. It is

also a slightly shorter and more direct route to the shaft, but requires additional road development. The alternative route makes use largely of existing tracks.

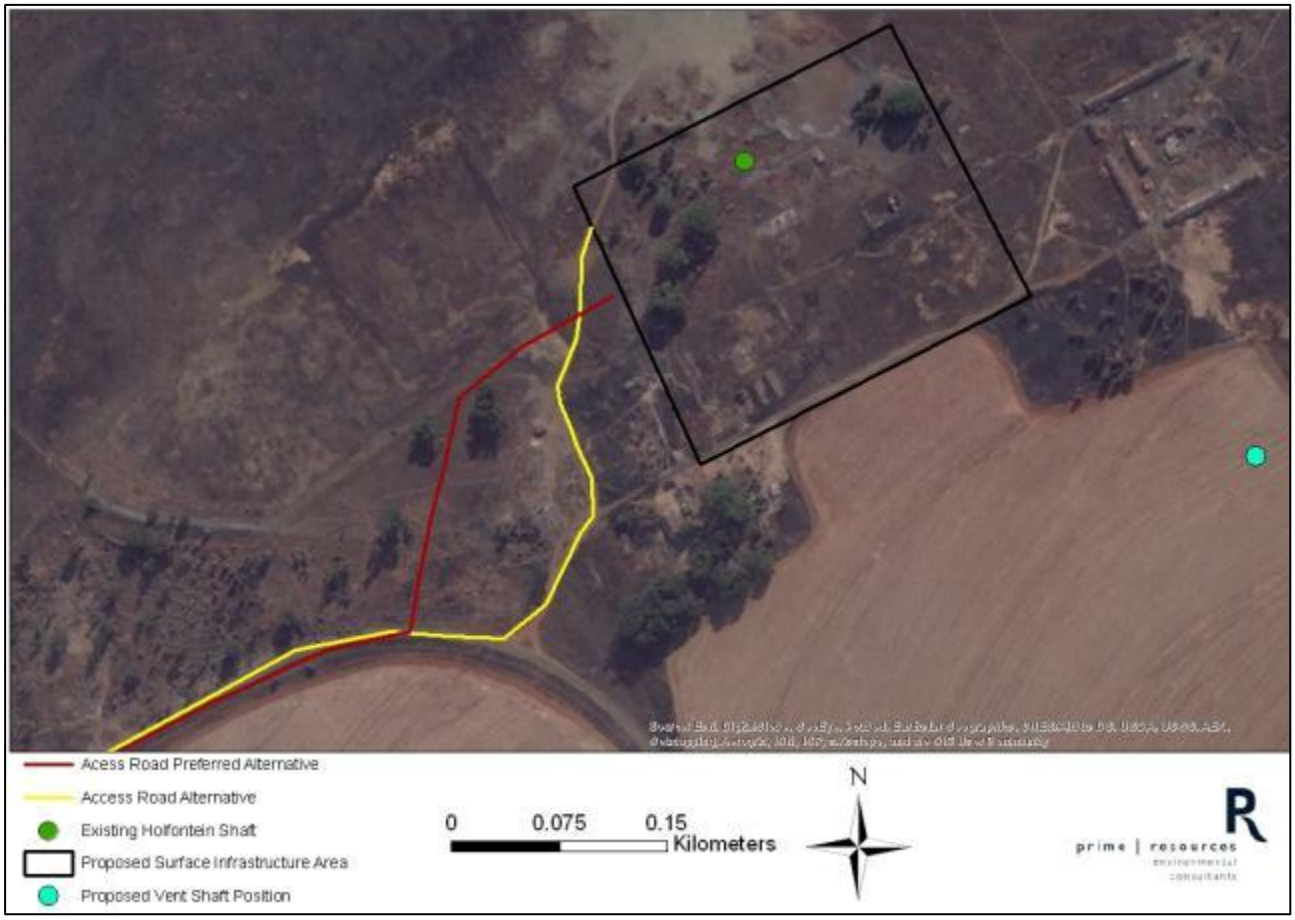


Figure 4: Access route alternatives

ALTERNATIVE	POTENTIAL IMPACT	MAGNITUDE	SCALE	DURATION	PROBABILITY	SIGNIFICANCE	
Alternative	Impacts of dust, noise and vehicle safety hazards at the residential dwellings en route to the existing shaft	6	2	3	4	44	Medium (-)
Preferred alternative (red in Figure 4)		4	2	3	3	27	Low (-)

ii) Haul Route Alternatives

Two alternatives were considered for the proposed haul route (refer to Figure 5). Both alternatives were limited as much as possible to existing roads to avoid disturbing additional areas. The preferred route (red in Figure 5) would require that haul trucks need only turn right onto Carnation Road from Pansy Road (en route to ME), or turn left onto Pansy Road from Carnation Road (en route from ME), thereby preventing the need to cross two lanes of traffic on Pansy Avenue. The alternative route (yellow) crosses Pansy Avenue with traffic travelling in both directions, a more difficult and unsafe option for heavy trucks.

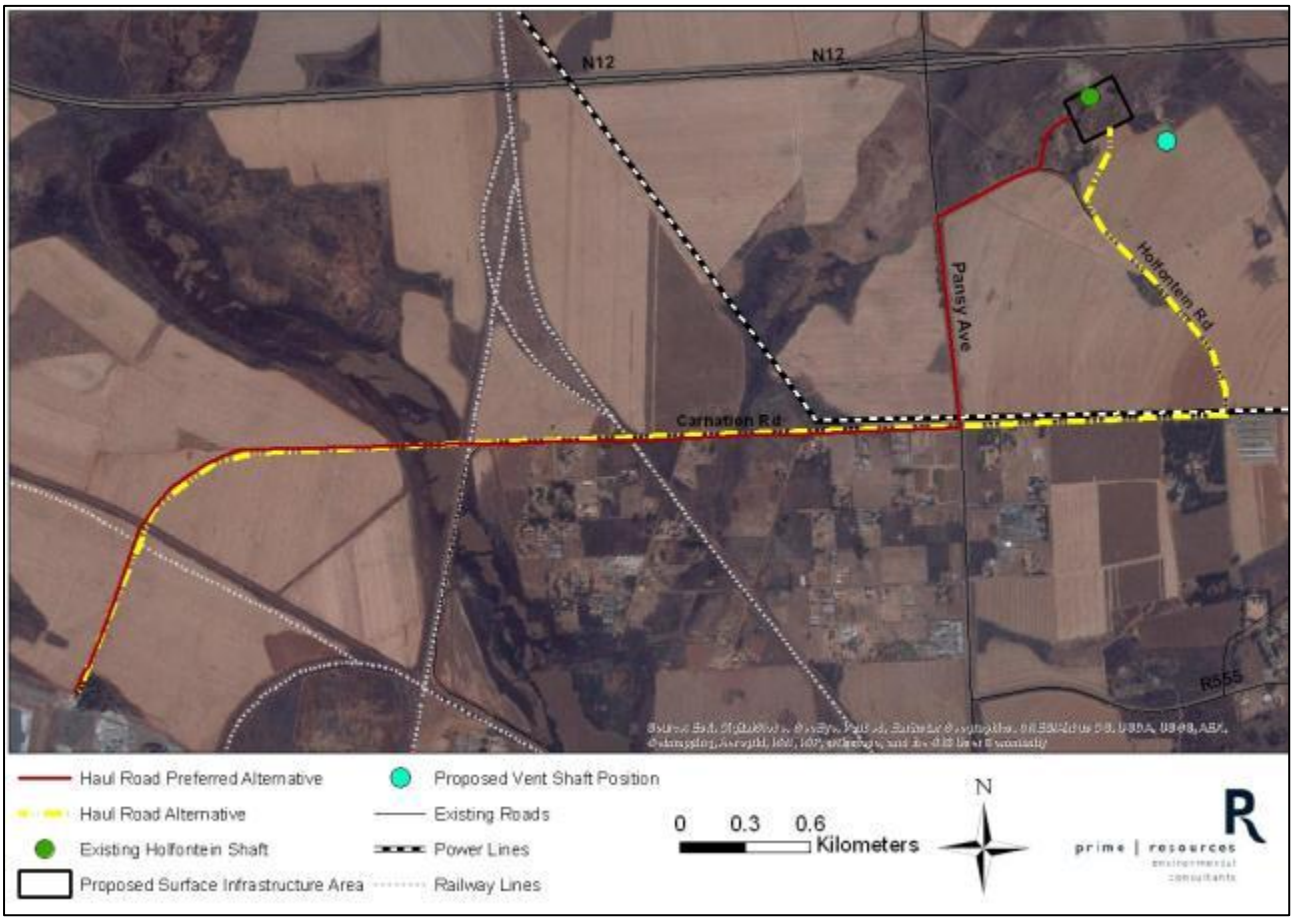


Figure 5: Haul route alternatives

ALTERNATIVE	POTENTIAL IMPACT	MAGNITUDE	SCALE	DURATION	PROBABILITY	SIGNIFICANCE	
Alternative	Traffic safety hazards posed by trucks travelling on Pansy Avenue	8	2	3	4	52	Medium (-)
Preferred alternative (red in Figure 5)		6	2	3	3	33	Medium (-)

iii) Power Line Route Alternatives

Alternative power line routes were investigated to provide electricity from the existing ME operations to the Holfontein Project area (refer to Figure 6). Route options were investigated along / within existing servitudes to avoid disturbance of untransformed areas as well as to avoid railway and powerline crossings where possible. The preferred alternative (red in Figure 6) was selected as it runs parallel to and crosses a railway line. The alternative route runs parallel to the Eskom servitude, which would require the construction / development of an additional servitude because Eskom requires that all development remain outside of 23 m of either side of the power lines.

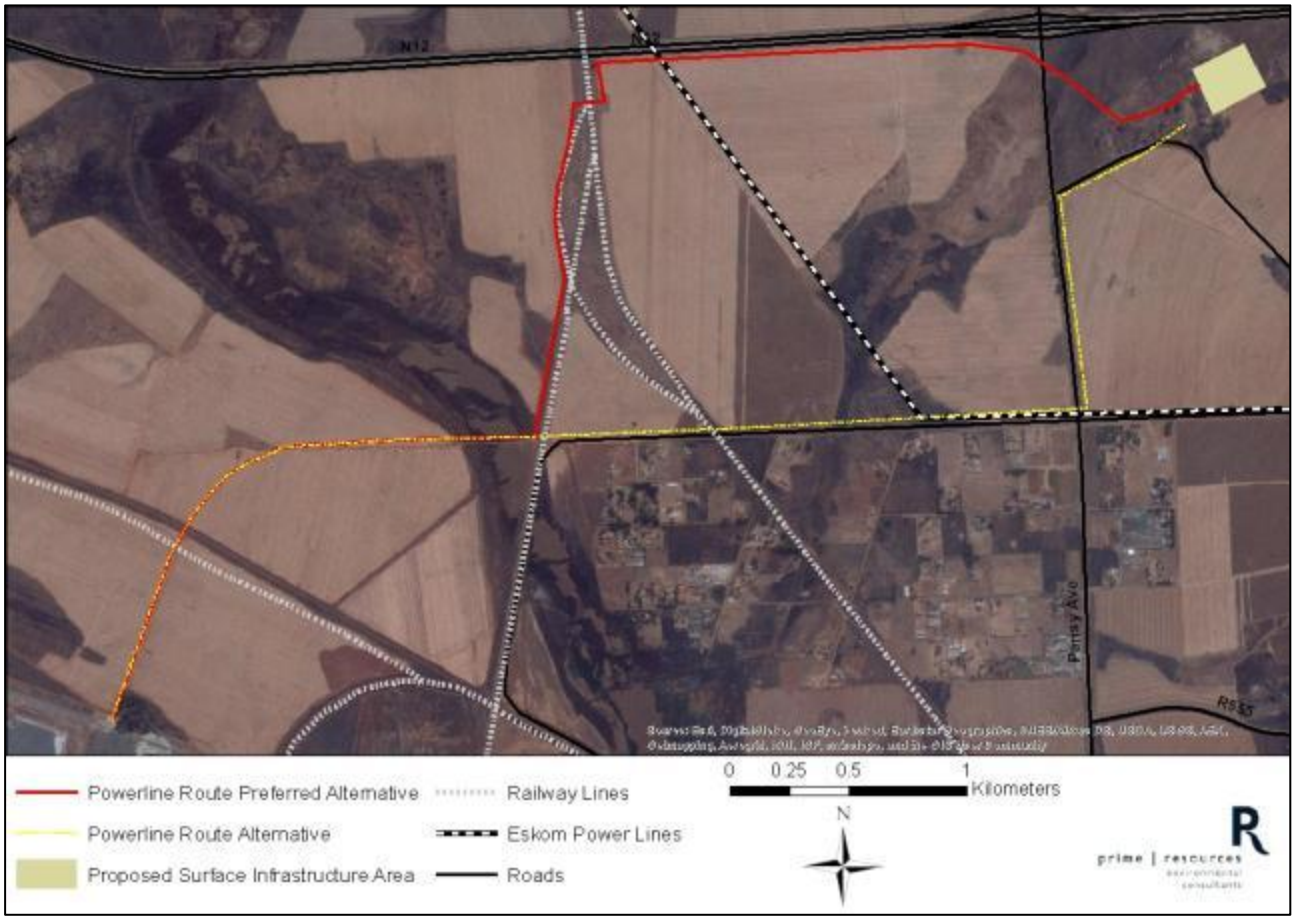


Figure 6: Power line route alternatives

ALTERNATIVE	POTENTIAL IMPACT	MAGNITUDE	SCALE	DURATION	PROBABILITY	SIGNIFICANCE	
Alternative	Disturbance of larger areas for additional servitudes	6	2	3	4	44	Medium (-)
Preferred alternative (red in Figure 6)		4	2	3	3	27	Low(-)

d) Technological Alternatives

As the project involves the refurbishing of an existing shaft, not many feasible technological alternatives are available. Two options for the type of bin to be utilised at the headgear for the storage of ore were investigated. The preferred alternative was to select a bin constructed out of concrete, rather than one constructed from resonating material such as steel. The concrete bin was selected as it will result in less noise being generated, and therefore a potentially lower noise impact on the surrounding residents.

ALTERNATIVE	POTENTIAL IMPACT	MAGNITUDE	SCALE	DURATION	PROBABILITY	SIGNIFICANCE	
Alternative - resonating bin	Nuisance noise generated by ore being discharged into the bin	8	2	3	4	52	Medium (-)
Preferred alternative - concrete bin		6	2	3	3	33	Medium (-)

e) Operational Alternatives

The following operational alternatives were considered:

- Movement of haul trucks at the shaft area – the preferred alternative of having a turn circle at the loading area was selected, as opposed to the option of trucks reversing into place for loading. The turn circle meant that reversing was avoided or limited, and therefore the noise generated from reverse hooters was minimised.
-

ALTERNATIVE	POTENTIAL IMPACT	MAGNITUDE	SCALE	DURATION	PROBABILITY	SIGNIFICANCE	
Alternative - need for trucks to reverse	Nuisance noise generated by haul truck reverse hooters	6	2	3	4	44	Medium (-)
Preferred alternative - turning circle		6	2	3	2	22	Low(-)

- Having change rooms site or transporting staff to site from the ME operations by bus were investigated as alternatives. It was more preferable to have staff transported by bus in order to minimise the surface footprint at the shaft, and reduce the potential in-migration of job-seekers.

ALTERNATIVE	POTENTIAL IMPACT	MAGNITUDE	SCALE	DURATION	PROBABILITY	SIGNIFICANCE	
Alternative - change rooms at the Holfontein shaft	Clearance and disturbance of a larger footprint to accommodate more surface infrastructure and the potential for the influx of job-seekers	6	2	3	4	44	Medium (-)
Preferred alternative - bussing staff from the ME operations		6	2	3	1	11	Low(-)

f) The "No-Go" Option

If the Holfontein Project is not considered, then the increase production, the sustaining of employment of existing employees and sustained economic benefit will not occur, instead a major downturn prior to decommissioning will occur.

This will prevent any further footprint impact at the Holfontein Project area (there is an existing footprint because of the historical mine development), and will prevent the associated environmental and social impacts [yet to be assessed, but refer to Section 11)c)] at the shaft and along the haul route. It will also however mean that employment and economic development as a result of the mining operations (specifically at ME operations) will experience a major turn down downturn prior to decommissioning in 2027.

10) DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED **(Describe the process undertaken to consult interested and affected parties including public meetings and one**

on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land)

Scoping Phase – Initial Public Participation Process

Landowner Notification

Landowner notification was obtained from the current landowners (as at the time of compiling this report, May 2015) of the Remaining Extent of Holfontein 71 IR (location of majority of surface infrastructure) and Ptn 68 (location of the ventilation shaft) of Holfontein 71 IR. The farm portion upon which the majority of the activities will be located (Remaining Extent of Holfontein 71 IR) will be purchased by New Kleinfontein Goldmine.

Media Notice

A media notice (in English) was published in the local newspaper (Springs Advertiser) on 11 June 2015, providing a brief project description, legislative requirements, and the process to be followed. The media notice also informed any Interested and Affected Parties (IAPs) of the process to follow to register on the IAP database, and provided details of the EAP to contact for more information. Refer to Appendix 5.1.

Site Notices

Site notices (in English) were posted up on site and at conspicuous locations (intersection of Pansy Avenue and Carnation Road and the ME security office) within the surrounding communities on 10 June 2015, providing a brief project description, legislative requirements, the process to be followed to follow to register on the IAP database and the deadline for registration, and provided details of the EAP to contact for more information. Site notices also indicated the location and availability of the Scoping Report and future documentation, as well as the commenting periods. Refer to Appendix 5.2.

IAP Registration

An IAP register was opened and representatives from all of the relevant State Departments, as well as any IAPs requesting to register, were added to the database. Refer to Appendix 5.3.

Commenting Period

The Scoping Report was made available for comment to State Departments (including the Competent Authority) via email -and placed within the public domain at the security office at New Kleinfontein Goldmine ME operations; at the historical mine hostel in the Khomponi community, with the community representative; and on the Prime Resources website, on 10 June 2015 for a commenting period of 30 days (11 June 2015 to 12 July 2015).

Background Information Document

A Background Information Document (BID) in both English and Zulu was compiled, which briefly describes the background and a brief description of the project and potential impacts, the legislated

environmental process, availability of the Scoping Report, the process to be followed to follow to register on the IAP database and the contact details for queries. The BID was made available to State Departments, via email, and to surrounding residents, by hand, on 10 June 2015. The BID will also be made available to any IAPs requesting further information and will be distributed at the public meetings. Refer to Appendix 5.4.

Public Meetings

An sms will be sent to all registered IAPs notifying them of the details of the public meetings to be held on 19 June 2015. Public meetings will be held on Tuesday 23 June 2015, at the Holfontein Project site at 16h00 pm and at the Springs Primary and Secondary School hall at 18h00, where a presentation will be given to inform IAPs about the proposed project, the potential impacts, future investigations and will allow IAPs an opportunity to ask questions or raise issues and concerns.

Comments and Response Report

A Comments and Response Report will be compiled (refer to Section 10)a) below), which will be submitted to the Competent Authority for consideration after the 30 day commenting period has ended.

EIA Phase – Feedback Engagement Process

During the EIA phase further stakeholder engagement will be conducted. Refer to Section 12)e) for the details of the feedback engagement process to be followed.

a) Summary of issues raised by IAPs **(Complete the table summarising comments and issues raised, and reaction to those responses)**

A Comments and Response Report will be compiled based on the outcomes of the scoping phase stakeholder engagement process.

11) THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

a) Baseline environment (Type of environment affected by the proposed activity - its current geographical, physical, biological, socio- economic, and cultural character)

i) Air Quality

Meteorological Character

According to the MM5 modelled meteorological data obtained for the project area, the prevailing winds for the period of January 2011 to December 2013 originate from the north-east and north-west sectors, with average wind speeds of between 3.60 and 5.70 m/s. Calm conditions (wind speeds < 1 m/s) are experienced for 6.73 % of the period (refer to Figure 7).

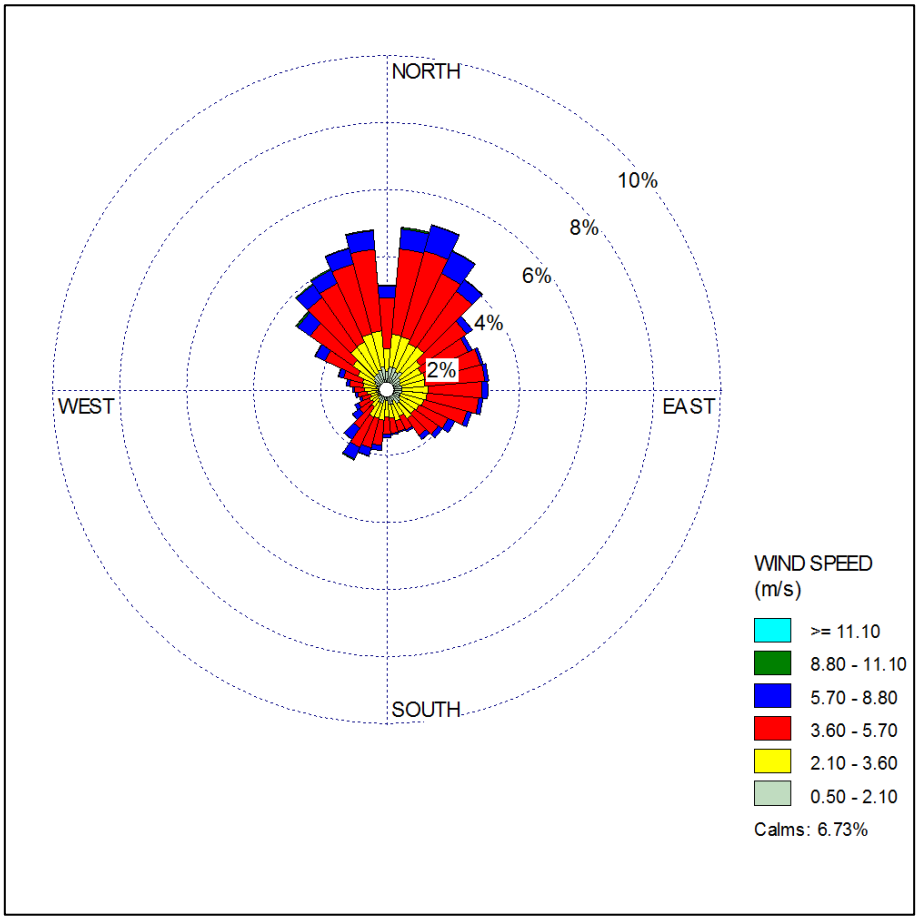


Figure 7: Wind rose depicting the average wind speed and direction for the project area for the period of January 2011 to December 2013

The seasonal variability in the wind field is shown in Figure 8. During spring and summer winds predominantly originate from the north-easterly sector. In autumn and winter wind flow predominantly originates from the north-westerly sector. Calm conditions occur mostly during the summer and autumn months (8.07 % and 7.58 % respectively), and the least during spring months (5.24 %).

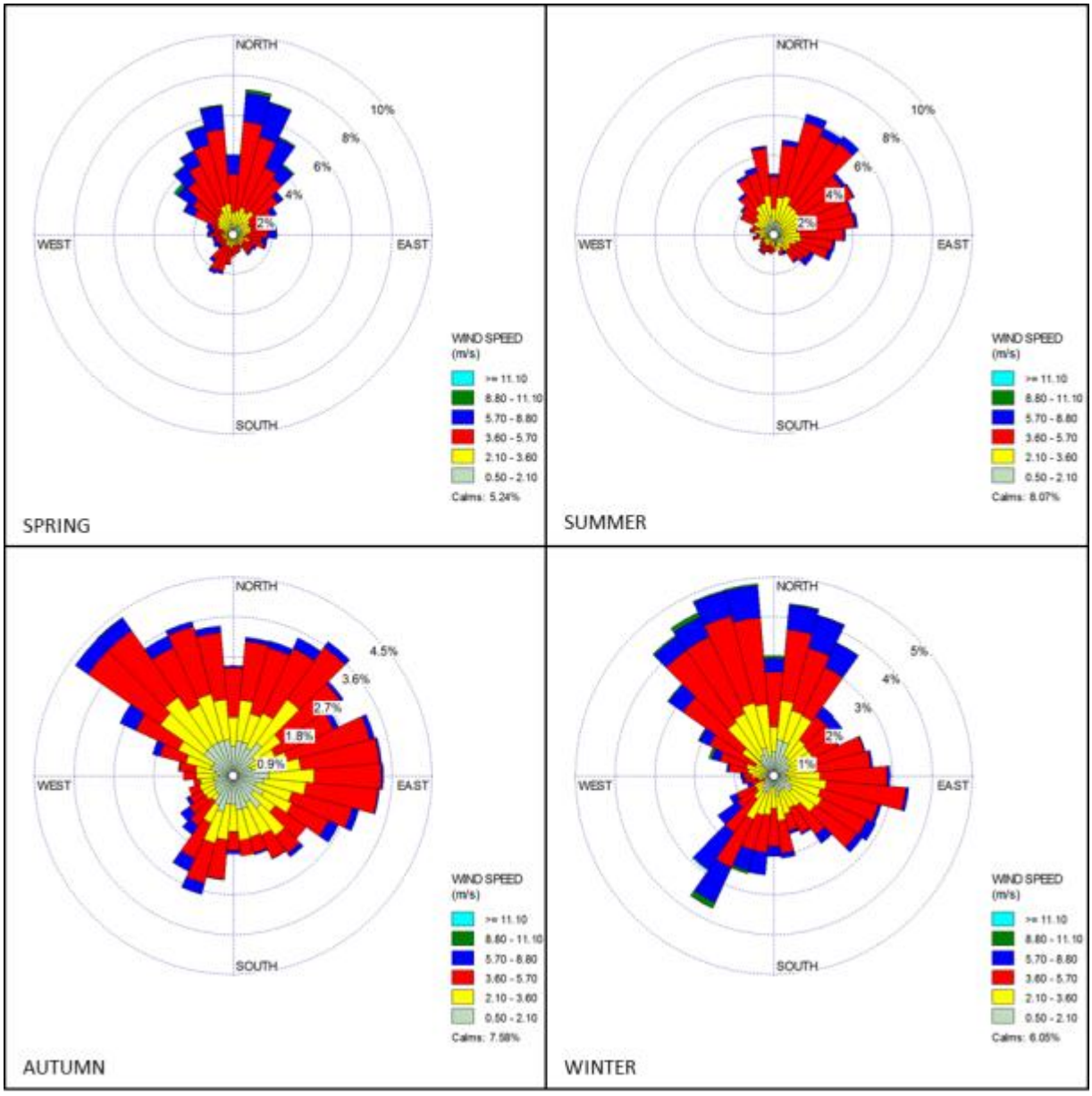


Figure 8: Wind roses depicting the seasonal variability in wind field for the project area for the period of January 2011 to December 2013

Figure 9 and Figure 10 below depict the average monthly temperature and humidity, according to the MM5 modelled meteorological data, for the Holfontein Project area for the period of January 2011 to December 2013. The highest average temperature (20˚C) was experienced in the summer months December, January and February; and the lowest average temperature (8 ˚C) was experienced in the winter months of June and July. The average monthly humidity was the lowest in November (59 %) and the highest in June (73 %) with the average humidity remaining fairly constant throughout the rest of the year.

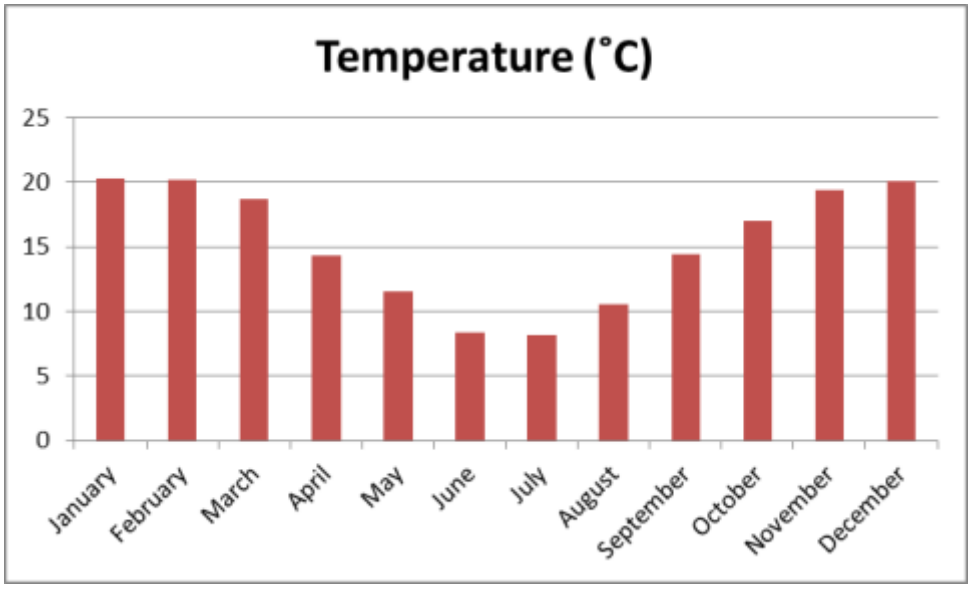


Figure 9: Average monthly temperature for the project area for the period of January 2011 to December 2013

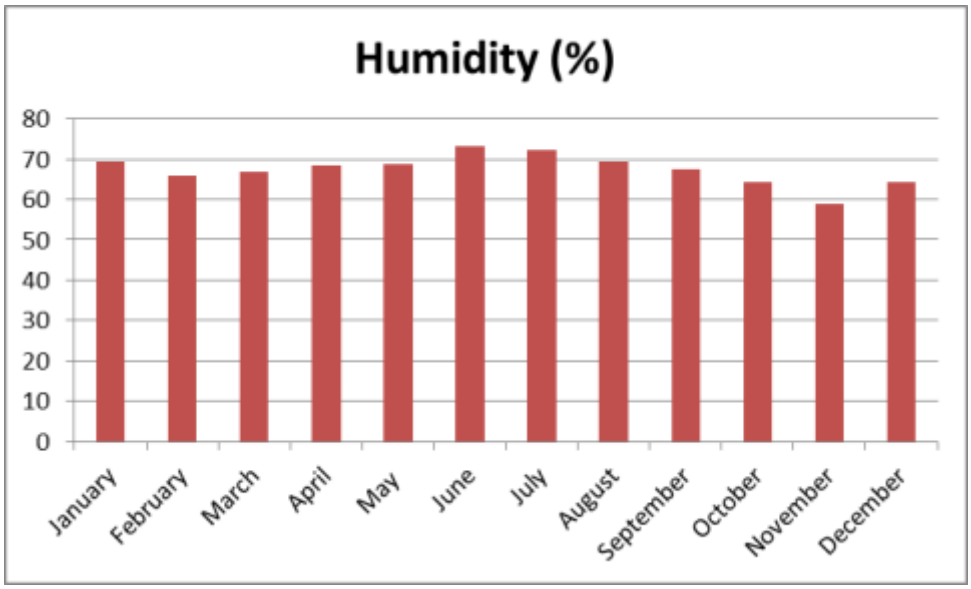


Figure 10: Average monthly humidity for the project area for the period of January 2011 to December 2013

Figure 11 below depicts the average monthly precipitation, according to the MM5 modelled meteorological data, for the Holfontein Project area for the period of January 2011 to December 2013. The highest monthly precipitation was experienced in the summer months of December and January (0.3 mm/h and 0.26 mm/h respectively) with the lowest experienced in winter in the month of July (0.0 mm/h).

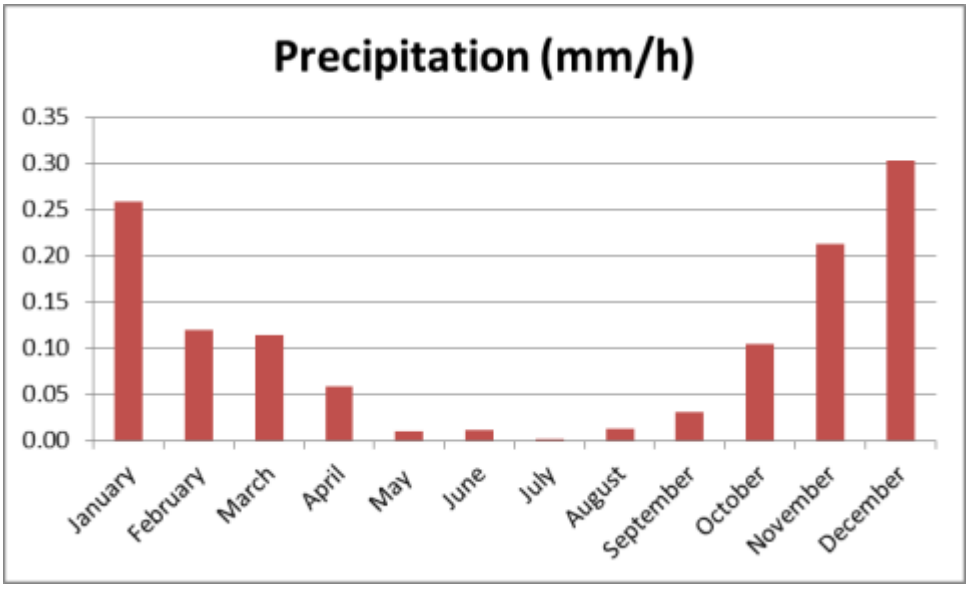


Figure 11: Average monthly precipitation for the project area for the period of January 2011 to December 2013

Background Ambient Air Quality

Local sources of air pollution include:

- Existing mining activities and tailings dam at the adjacent ME operations;
- Fugitive dust emissions from historic limestone quarrying and historic goldmine tailings;
- Fugitive dust emissions from drilling for prospecting activities for the Holfontein Project;
- Fugitive dust emissions from agricultural activities;
- Emissions from the Welgedacht Waste Water Treatment Works (WWTW);
- Emissions from the Holfontein hazardous waste (H:H) landfill facility;
- Household fuel burning at surrounding settlements;
- Vehicle exhaust emissions from vehicles travelling on the N12 highway and surrounding roads;
- Industry including Sappi Enstra and the Impala Platinum Refinery; and
- Agricultural biomass burning.

Air quality monitoring data was obtained for the Etwatwa Station, located 7 km north of the project area, for the period March 2011 to September 2012. When comparing the annual average concentrations of NO_2, SO_2 and PM_{10} with the National Ambient Air Quality Standards (NAAQS) the annual average PM_{10} concentration (104 µg/m^3) exceeded the NAAQS allowable concentration (40 µg/m^3).

Sensitive Receptors

Sensitive receptors include all surrounding permanently occupied areas which may be impacted by the proposed project in terms of air quality (refer to Figure 12). These include the residents of the historic mine house and mine hostel, residents of the Welgedacht small holdings, and residents of the Breswol small holdings.

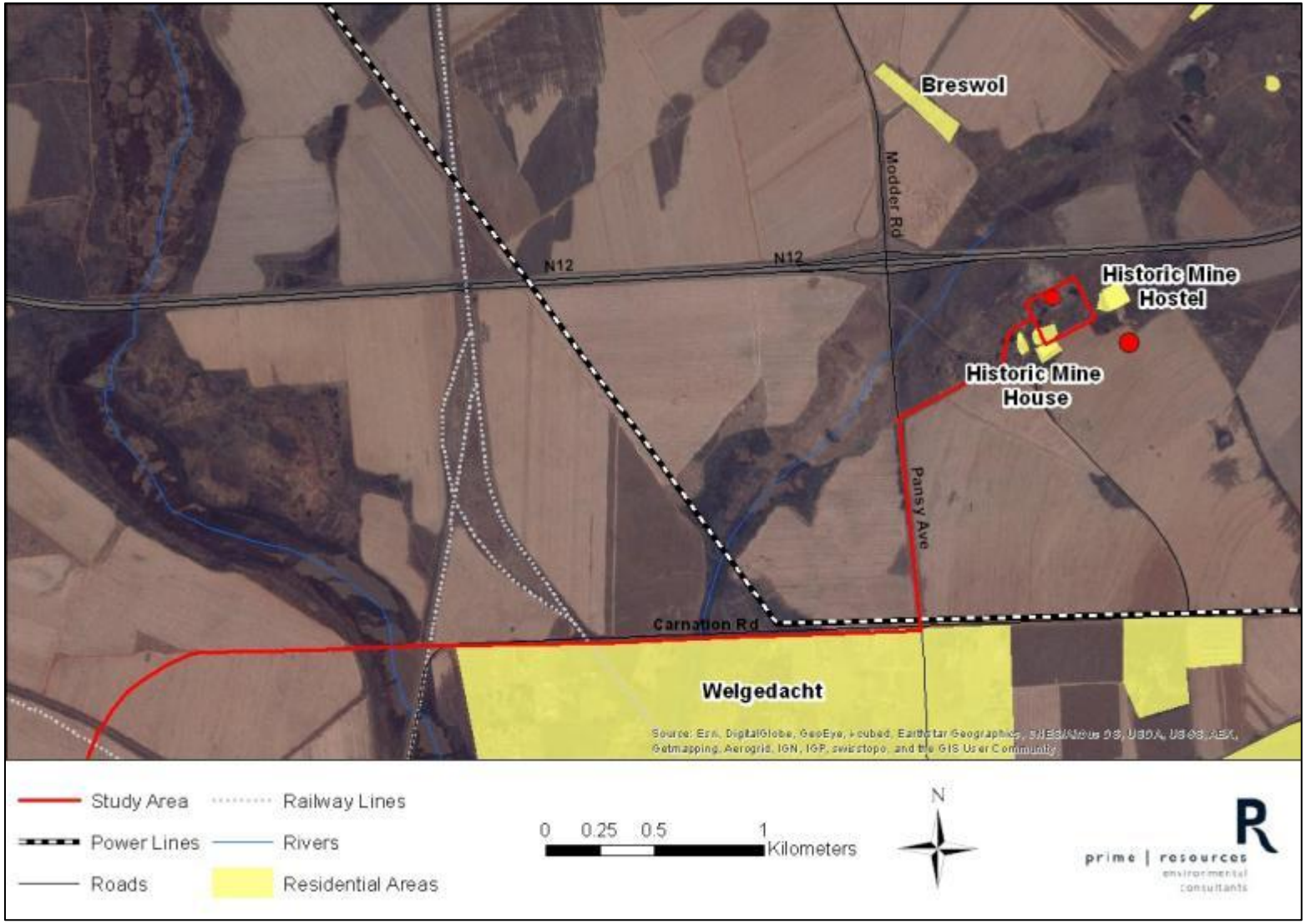


Figure 12: Residential areas within the project area

ii) Archaeology

According to a cultural and heritage study conducted by Apelser Archaeological Consulting in April 2015 (attached as Appendix 7), no sites of cultural heritage importance were identified within the project site. Sites and features recorded during the assessment were mostly related to the earlier Holfontein mining operations, which include the remains of various structures such as headgear foundation and bases ("feet"), the old Holfontein shaft and some mine buildings.

Background research indicated that there are no known cultural heritage (archaeological or historical) sites or features in the project area, although there are some known Stone Age & Iron Age sites in the larger geographical area further south and north of the project area. The historic mining hostel is located outside the Holfontein Project site and will not be impacted. The historic mine house, which may be of significance, as well as a fenced off cemetery near ME operations were recorded next to the proposed haul route (refer to Figure 13).

The mining related structures located inside the proposed site (Holfontein shaft area) are all dilapidated and consist of foundations only. They are therefore of low significance and can be demolished and no further mitigation is required.

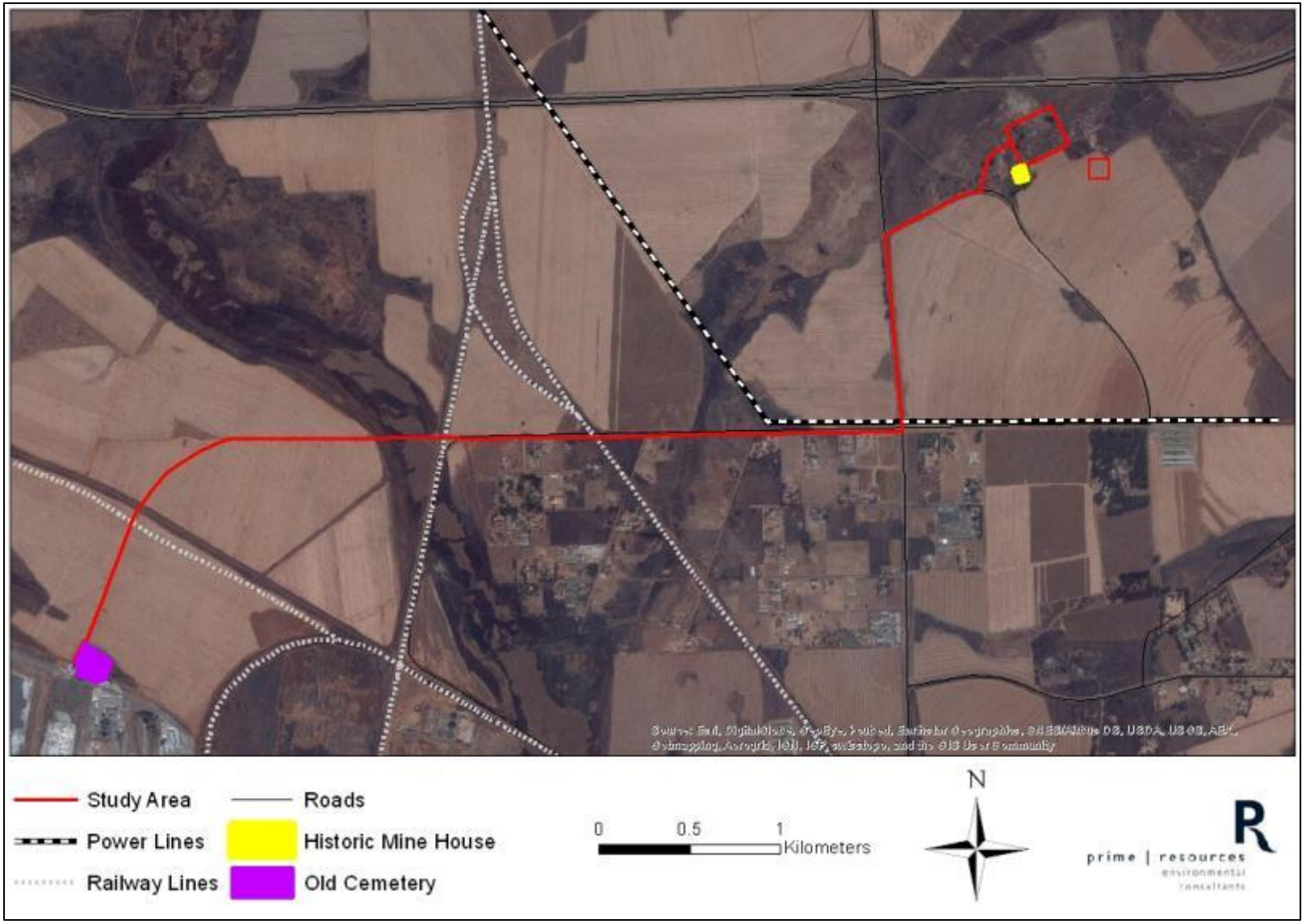


Figure 13: Cultural and heritage resources within the surrounding area

iii) Aquatic Ecology

The following information was obtained from the aquatic ecology baseline study conducted by Strategic Environmental Focus (SEF) in April 2015 (attached as Appendix 8).

Water Quality

Aquatic organisms are directly influenced by the quality of the water in which they live. Table 1 presents the in situ water quality results within the project area. Due to the absence and/or unavailability of applicable Resource Water Quality Objectives for the Upper Vaal water management area, the "Ideal Catchment Background" and/or "Acceptable Management Target" values from the in-stream water quality guidelines for the Blesbokspruit catchment area were used for comparative purposes. All values observed to exceed the stipulated guideline range and/or value was indicated in red.

Table 1: In situ water quality results obtained for aquatic sampling points within the project area.

SITE	TIME	TEMP (˚C)	PH	EC*	TDS**	DISSOLVED OXYGEN	
				(mS/m)	(MG/L)	(MG/L)	(%SAT)
Guideline Range / Value***		-	6.5-8.5	<45	<338	>6.0	-
Site 1	11h00	17.9	7.67	44.1	330.8	4.91	51.9
Site 2	13h00	22.1	6.96	43.5	326.3	4.36	45.6
Site 3	15h00	22.6	7.14	**60.1**	**450.8**	0.62	6.5
Site 4	11h30	19.9	6.48	31.8	238.5	1.90	20.8

* Electrical Conductivity
** Total Dissolved Solids
*** In-stream Water Quality Guidelines for the Blesbokspruit Catchment

Based on the *in situ* water quality assessment of the assessed section of the Blesbokspruit, there were only two major causes for potential concern: the elevated EC and TDS observed at Site 3, and the low dissolved oxygen concentrations observed at each of the assessed sites, especially at Site 3. It is suspected that Site 3 is heavily polluted with domestic and/or organic waste originating from the Welgedacht WWTW. Nevertheless, it should be noted that the significance of low and/or depleted dissolved oxygen levels in natural systems is not necessarily related to the magnitude of change, but rather to the frequency, timing and duration of these occurrences. Refer to Figure 14.

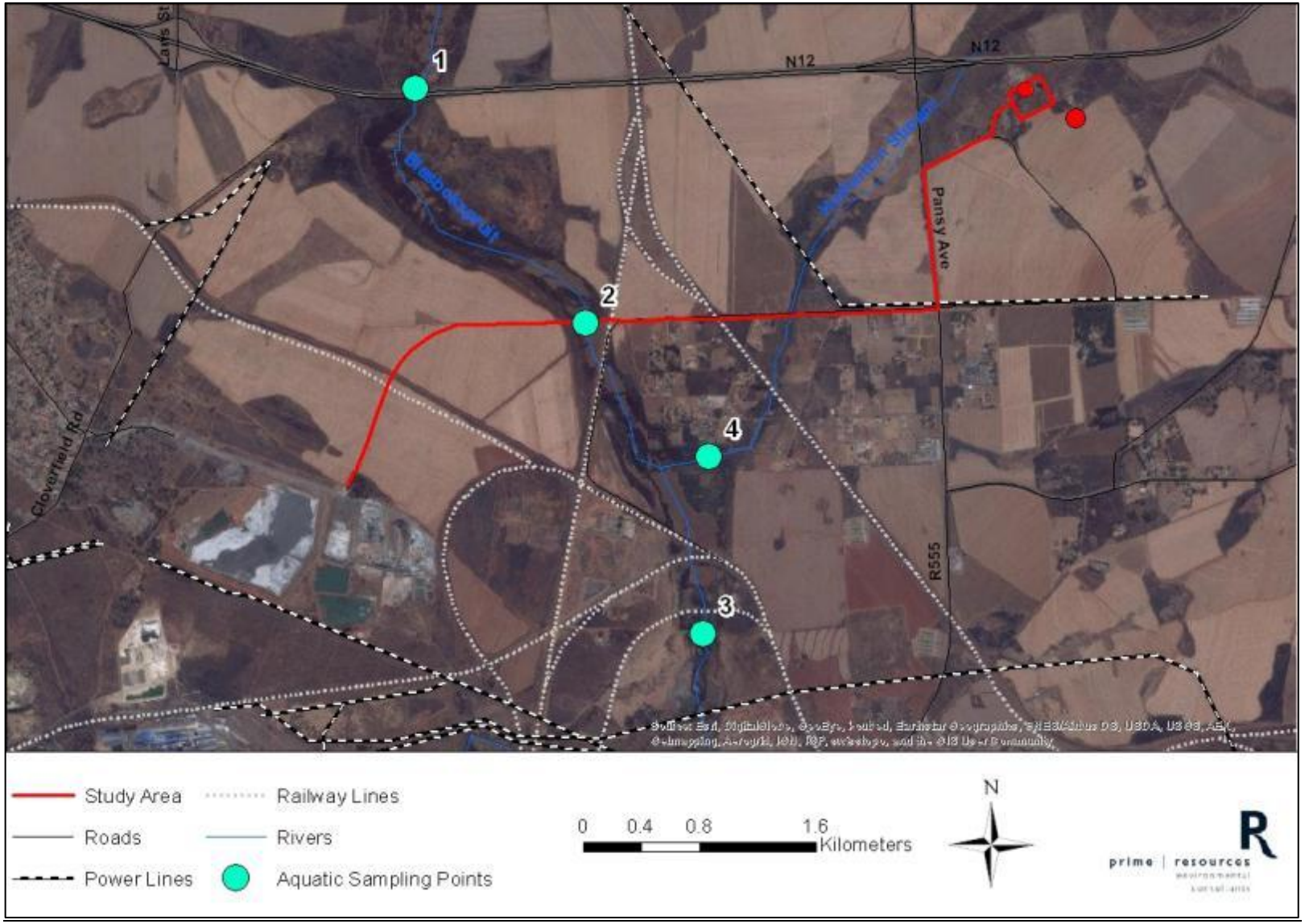


Figure 14: Aquatic sampling sites

Aquatic Habitat

Aquatic habitat observed along the Blesbokspruit system (excluding Site 4) was observed to be in relatively good condition with the general occurrence of each of the three biotopes and the presence of some hydraulic diversity. The conditions of the unnamed tributary of the Blesbokspruit (Site 4) (referred to as the Holfontein Stream for the purposes of this study) were described as poor, due largely to the wetland nature of the system. The in-stream habitat integrity associated with the main-stem section of the Blesbokspruit represented largely modified conditions (PES Category D) with a large loss of natural habitat, biota and basic ecosystem function, while the riparian area associated with this system was defined as a largely-to-seriously modified habitat (PES Category D/E). The main drivers of this change were suspected to be the physico-chemical deterioration within the river reach and flow modification, as a result of historical industrial inputs and urban runoff from southern Gauteng.

Aquatic Macroinvertebrates

A total of 27 different aquatic macroinvertebrate taxa were collected within the project area, ranging from 13 to 20 taxa per site. Of the collected taxa, only two families exhibited a moderate sensitivity to water quality impairment, namely Aeshnidae (Hawker and Emperor Dragonflies) and Hydrachnellae (Water Mites). Of particular interest was the direct correlation exhibited between the increasing number of non-airbreathing macroinvertebrate taxa and associated ASPT Values (Site 1 > Site 2 > Site 3) against the dissolved oxygen concentrations (Site 1 > Site 2 > Site 3), which suggested that selected airbreathing taxa were relatively common within the project area and that the non-airbreathing taxa were a more accurate measure of water quality conditions exhibited during the assessment. Furthermore, the complete absence of the sensitive mayflies, caddisflies and stoneflies (Ephemeroptera, Trichoptera and Plecoptera) indicated poor water quality, which was also confirmed during the current assessment. Based on PES determinations, it was determined that all the assessed sites were in a seriously modified state (PES Category E), while the downstream site (Site 3) was defined to be in a seriously-to-critically impaired state (PES Category E/F).

Ichthyofauna

A total of 87 individual fish were collected within the project area, comprising of five indigenous species and one alien species. While it was expected that fish species diversity within the wetland area would be limited, the number of fish species was considered to be a positive sign. Comparatively, with the exception of *Cyprinus carpio* and *Tilapia sparrmanii,* each of the fish species collected during a biomonitoring survey of the Blesbokspruit between November 1995 and July 1996 by the Institute for Water Quality Studies were recorded during the current survey.

Based on results, it was determined that the PES of the fish assemblage in the associated section of the upper Blesbokspruit system represented a largely-to-seriously modified state (PES Category D/E) with fewer species present than expected due to a loss of some intolerant forms. However, based on the wetland nature of the area and the occurrence of a higher number of fish species than expected during the current assessment, it is likely that the current condition of the system would be marginally improved when applying a wetland-appropriate PES determination method.

In-stream Biological Integrity and EcoStatus

Based on the In-stream Response Model, the integrated in-stream biological integrity of the upper Blesbokspruit system was defined to be in a poor ecological condition (PES Category E) with a few sensitive taxa absent, as a result of the seriously modified state of the system. However, again, the wetland nature needs to be considered, as aquatic biodiversity within wetlands can be limited relative to riverine ecosystems.

Furthermore, the overall EcoStatus for the upper section of the Blesbokspruit was determined to be in a largely-to-seriously modified condition (PES Boundary Category D/E) with an extensive loss of basic ecosystem function across each of the assessed facets of the assessment.

Ecological Importance and Sensitivity

The abovementioned river reach was considered to be of a moderate ecological sensitivity based on moderate fish and aquatic macroinvertebrate sensitivities to physico-chemical deterioration and flow alteration. A very low sensitivity of the riparian zone was noted, as vertebrate species other than fish utilising the riparian or in-stream habitat are relatively tolerant of water level fluctuations and flow modifications.

iv) Hydrogeology

The groundwater baseline study conducted by Groundwater Square in April 2015 (attached as Appendix 9) indicated that the Karoo- and dolomitic aquifers are the most important aquifers in the region surrounding the Holfontein Project.

Hydrocensus

Hydrocensus information of external groundwater users was gathered within a ≥1.5 km radius of the Holfontein shaft (3 km to the north and east) during February 2015. 22 points were surveyed (refer to Figure 15), of which 11 were sampled under application conditions (i.e. collecting samples while boreholes were pumping). Borehole yields based on the hydrocensus in the Karoo aquifer range from 0.02 ℓ/s to 0.2 ℓ/s. Borehole yields in the dolomitic aquifer range from 0.3 ℓ/s to > 20 ℓ/s. Based on the high borehole yields, the representative hydraulic conductivity of the dolomitic aquifer can be 10 times to 100 times greater than that of the Karoo aquifer.

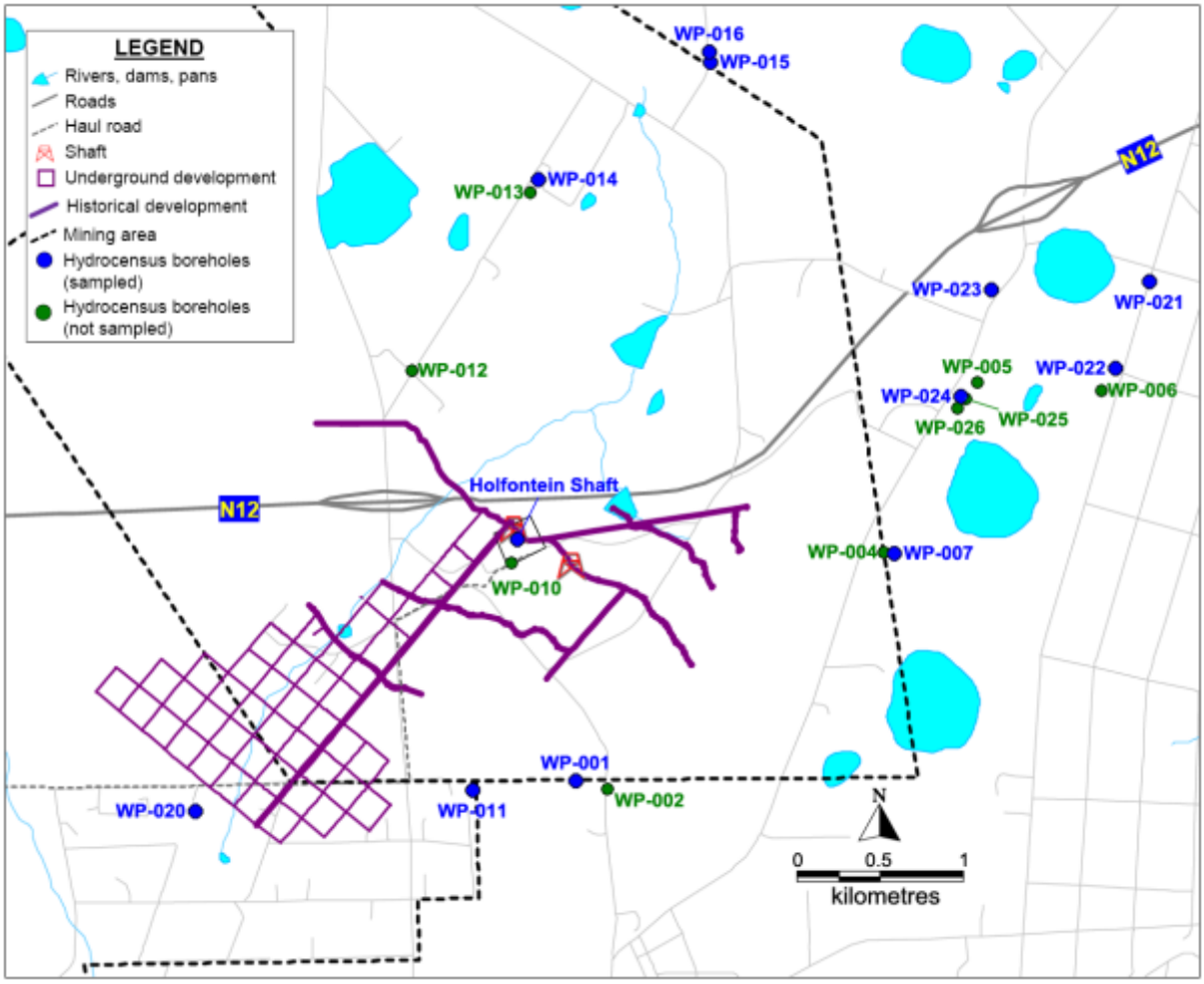


Figure 15: Hydrocensus borehole localities

Groundwater Quality

Sampling of the Holfontein shaft was performed in November 2014. Samples were retrieved at depths of 115 m, 215 m and 300 m depths. No contamination from mining could be detected.

In terms of groundwater quality of boreholes investigated in the hydrocensus in February 2015, minor distinctions could be found between samples collected in the Karoo aquifer, and the dolomitic aquifer, which underlays the Karoo aquifer. All dolomitic water falls within the SANS-241, 2006, guideline concentrations. One borehole, WP-007 (at fish farm), appears to be slightly contaminated in terms of Na, Cl and F. It was not considered in the determination of the background groundwater quality profile. Compared to the Karoo aquifer, the dolomitic aquifer reflected slightly higher pH, Mg and Total Alkalinity concentrations; Na and Cl concentrations varied across a greater range; there is no clear difference in the SO_4 concentrations of the two aquifer systems (i.e. no clear gold mining or coal mining impacts are reflected). Both the Karoo- and dolomitic aquifers can be classified as uncontaminated.

Groundwater Levels

Shallow groundwater levels within the Karoo aquifer range from <5 m to ±15 m deep, resulting in a groundwater flow field which mimics the surface topography. Due to groundwater abstraction, the typical groundwater table in the dolomitic aquifer is in the order of 100 m deep, which is approximately 50 m lower than the Blesbokspruit. The water table in the Holfontein shaft is 36 m

deeper than surrounding dolomitic groundwater levels. It is believed that constant pumping from the dolomitic aquifer – and to a lesser extent, regional dewatering of the East Rand Basin – have resulted in additional dewatering of the dolomitic aquifer at depths exceeding 100 m. i.e. if groundwater monitoring boreholes could be drilled deeper than the hydrocensus boreholes, it would likely reflect the same elevations as observed in the Holfontein shaft. Refer to Figure 16.

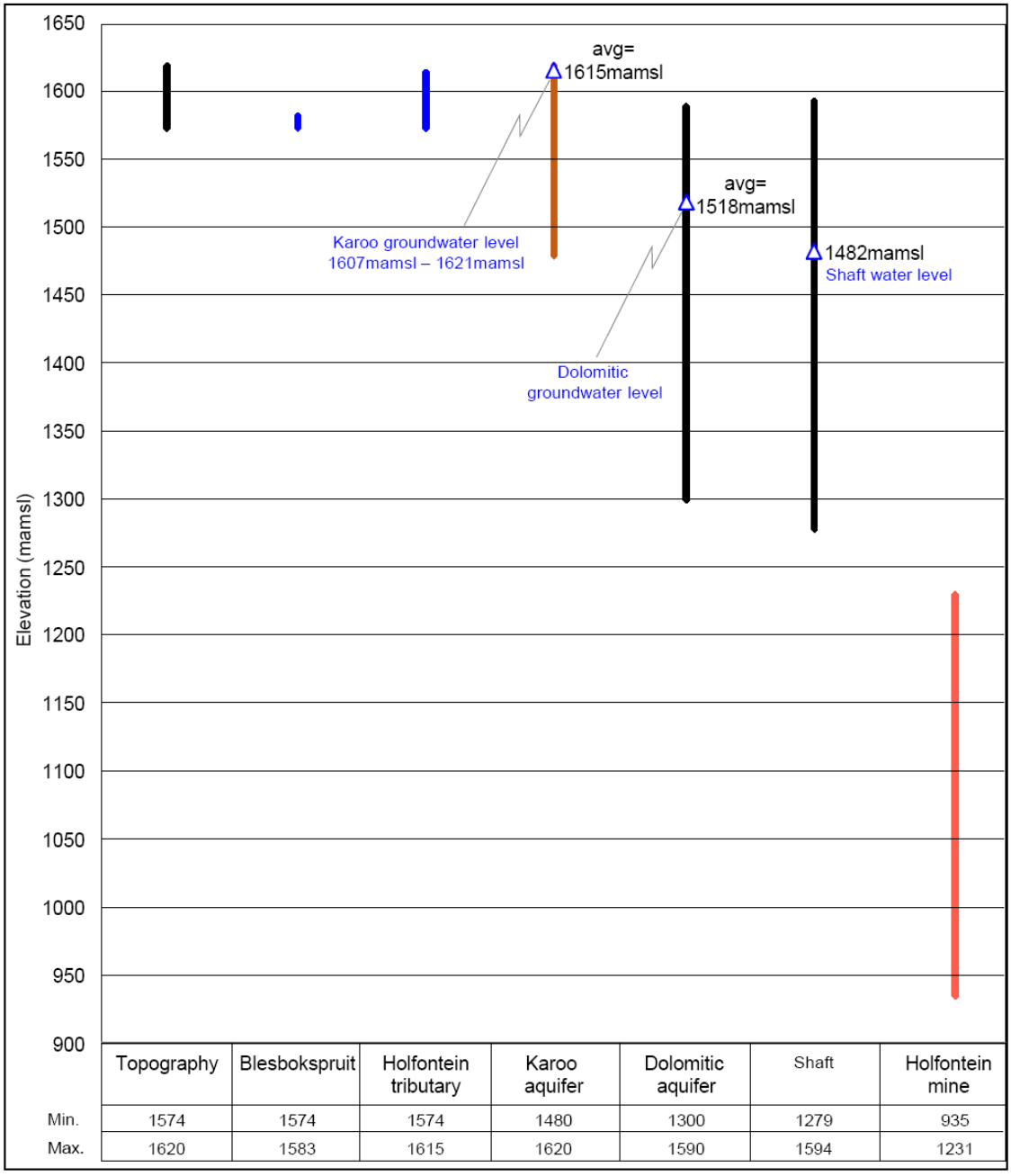


Figure 16: Summary of aquifer elevations and groundwater levels

Geophysical Survey

A geophysical survey was undertaken to locate geological structures in the project area, targeting the shallow Karoo rock environment. A resistivity survey was undertaken along the traverse line indicated in Figure 17. The data did not indicate any significant continuous linear feature transecting the site.

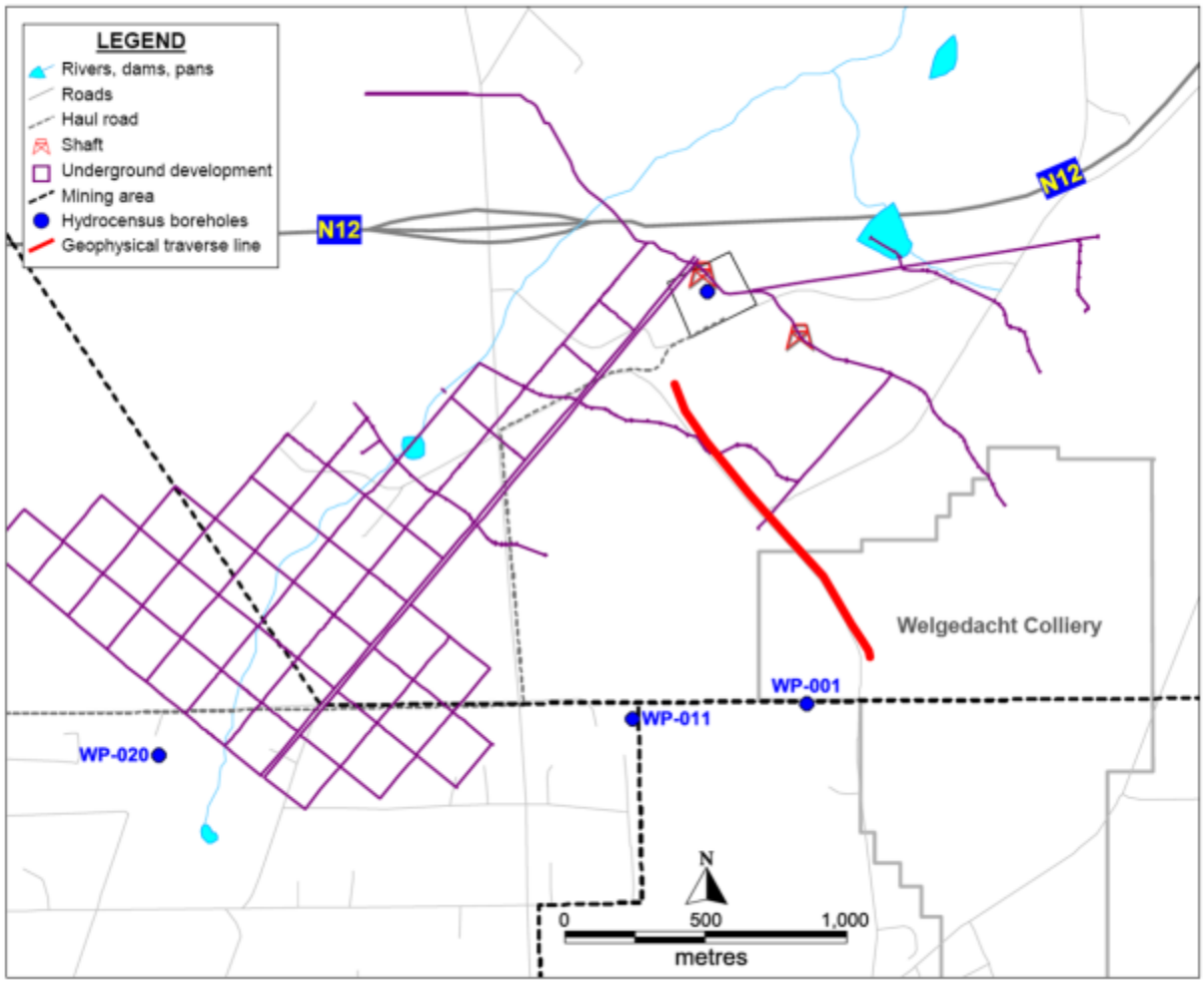


Figure 17: Resistivity survey traverse line

Mine Water Flow

There is not – and will not be - any direct connection between the Holfontein shaft and the historical Welgedacht Colliery, which is located directly south-east of Holfontein, at least 300 m shallower in the Karoo formation. There will also be no connection between the Holfontein shaft and ME. The ME dewatering cone does not extend to the Holfontein Project area.

Groundwater Flow System - Karoo Aquifer

Due to the shallow groundwater table the groundwater flow mimics the surface topography. Very little water seeps into the Karoo aquifer from the local river system, rather Karoo groundwater forms base-flow to some low-lying areas. Given the natural groundwater table in the Karoo aquifer, groundwater movement, downward, through the Karoo aquifer to the dolomitic aquifer will not exceed rainfall recharge to the Karoo aquifer.

Rainfall recharge to the Karoo aquifer is much lower than for the dolomitic aquifers. Rainfall recharge occurs in the following manner:

- Natural- and disturbed grass land;
- Several natural pans occur in the area, especially along the Quaternary Catchment boundary;
- Farming crops of which some are irrigated;
- Agricultural dams and quarries;

- Two clay quarries and two dams (Lushoff Dam and Ericson's Dam) are located at Holfontein H:H Hazardous Waste Disposal Site; and
- The mine workings of the old Welgedacht Colliery, which is located directly southeast of Holfontein, is ±63 m deep and falls within the Karoo Aquifer. These mine workings have been flooded and this water will not have a material influence on the Holfontein shaft water balance.

Groundwater Flow System - Dolomitic Aquifer

The following information is indicative of groundwater flow from surrounding areas toward the dolomitic aquifer neighbouring the Holfontein shaft. The shallow dolomitic aquifer to the west of the Blesbokspruit records shallow groundwater levels. Groundwater is actively pumped by farmers, via boreholes identified during the hydrocensus, from the dolomitic aquifer surrounding the Holfontein shaft. The water level in the Holfontein shaft, which is possibly a reflection of the deeper dolomitic aquifer, is 36 m deeper than the average groundwater level in the dolomitic aquifer zone from which local farmers are pumping. North of the dolomitic basal "drop-off" groundwater intersections recorded during exploration ranged between 9 m and 89 m deep, while yields ranged between 0.3 ℓ/s and 3.3 ℓ/s (average 0.9 ℓ/s). South of the dolomitic basal "drop-off" groundwater intersections ranged in depth between 11 m and 236 m, while yields ranged between 0.3 ℓ/s and 8.3 ℓ/s (average 1.5 ℓ/s).

From the observed water level and yielding capacity distribution it would appear that the more productive dolomites around the north-eastern extent of the Holfontein Project area, are separated from the lesser productive dolomites to the north-west, west and south-west (probably by the attenuation of the near-surface syenite sill along the central portion of the project area's south-western boundary.

Hydrocensus information suggests that borehole yields range from 0.3 ℓ/s to >20 ℓ/s (i.e. confirming the lower limit in terms of yield, but it is possible to drill highly productive boreholes in the dolomitic aquifer). The Department of Water and Sanitation (DWS) dolomitic groundwater level monitoring station B2N0052 (located 4.5 km north-east of the Holfontein shaft) indicated yields of ±20 ℓ/s.

Rainfall recharge to the dolomitic environment will be at least three times the rate of recharge to the Karoo aquifer on an annual basis. Inliers of Malmani dolomite are exposed in parts of the Blesbokspruit flood plain, and will contribute significantly to the water balance of the dolomitic aquifer, especially under dewatered conditions. Oxygen and hydrogen isotope compositions in Grootvlei Mine, indicated that surface water contributed between 30 % and 40 % of the underground mine water (i.e. 60 % to 70 % of the underground water is derived from ground and/or fissure water).

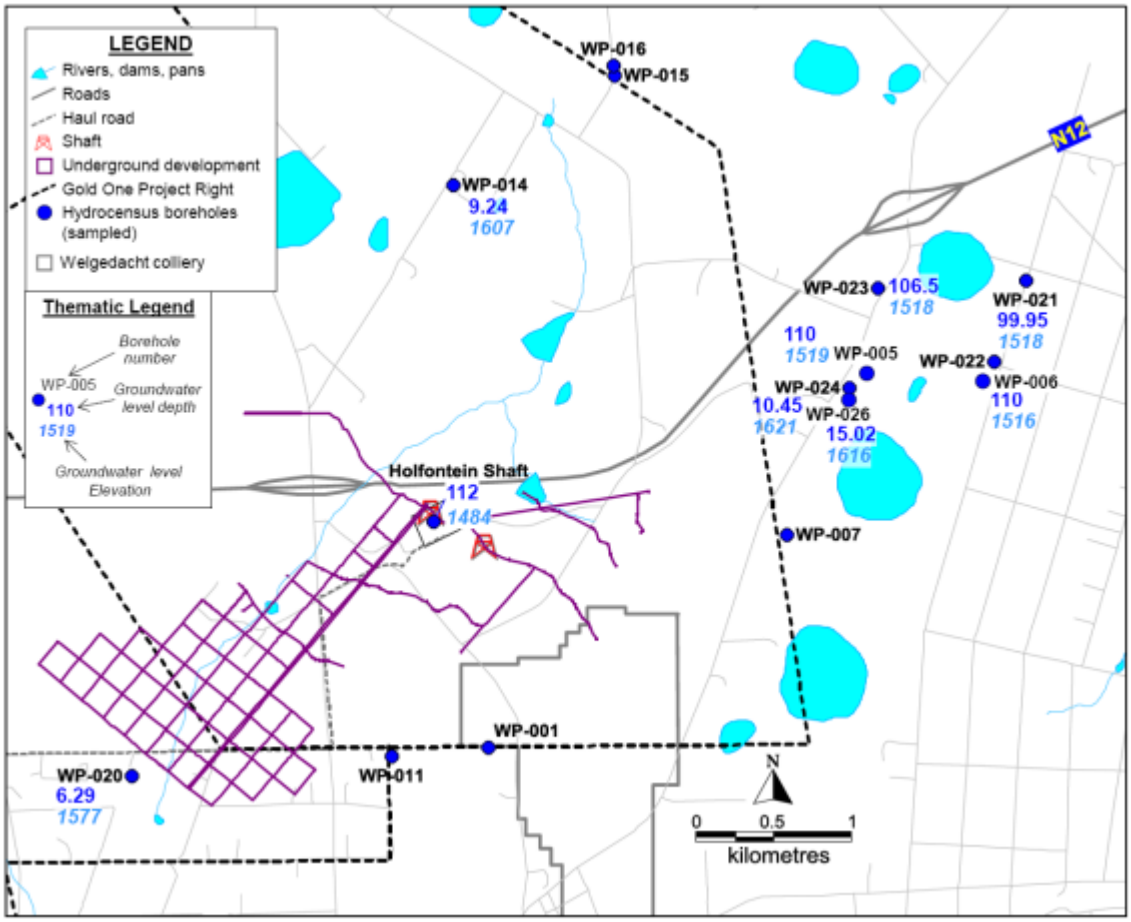


Figure 18: Hydrocensus borehole groundwater levels

v) Hydrology

Catchment Description

According to the surface water and hydrology baseline study undertaken by African Environmental Development in April 2015 (attached as Appendix 10), the Holfontein Project falls within quaternary catchments C21D within the Upper Vaal River Water Management Area (WMA) (refer to Figure 19). The project area includes the Holfontein Stream which originates at the Holfontein hazardous waste (H:H) landfill facility, as a small, non-perennial stream that flows past the existing Holfontein shaft area into the Blesbokspruit. The proposed haul road also crosses the Blesbokspruit.

The upper reaches of the Blesbokspruit drain this quaternary catchment and continue through quaternary catchments C21E and C21F before reaching its confluence with the Suikerbosrant River. The Blesbokspruit flows in a southerly direction from its origin on the farm Vlakfontein 25IR, through the Marievale Bird Sanctuary and past Nigel to its confluence with the Suikerbosrant River. The Suikerbosrant River flows into the Vaal River downstream from the Vaal Dam.

The surface area of the Holfontein Stream catchment up to its confluence with the Blesbokspruit is 25.23 km^2. There are no flow-gauging stations in the Holfontein Stream. The mean annual run-off (MAR) for this catchment is 36.1 mm annum.

Surface drainage from the proposed surface infrastructure area occurs northwards towards the embankment of the N12 Motorway and then westwards along the embankment towards the

Holfontein Stream. The slope of the land at and around the existing Holfontein shaft and the proposed surface infrastructure area is not very steep.

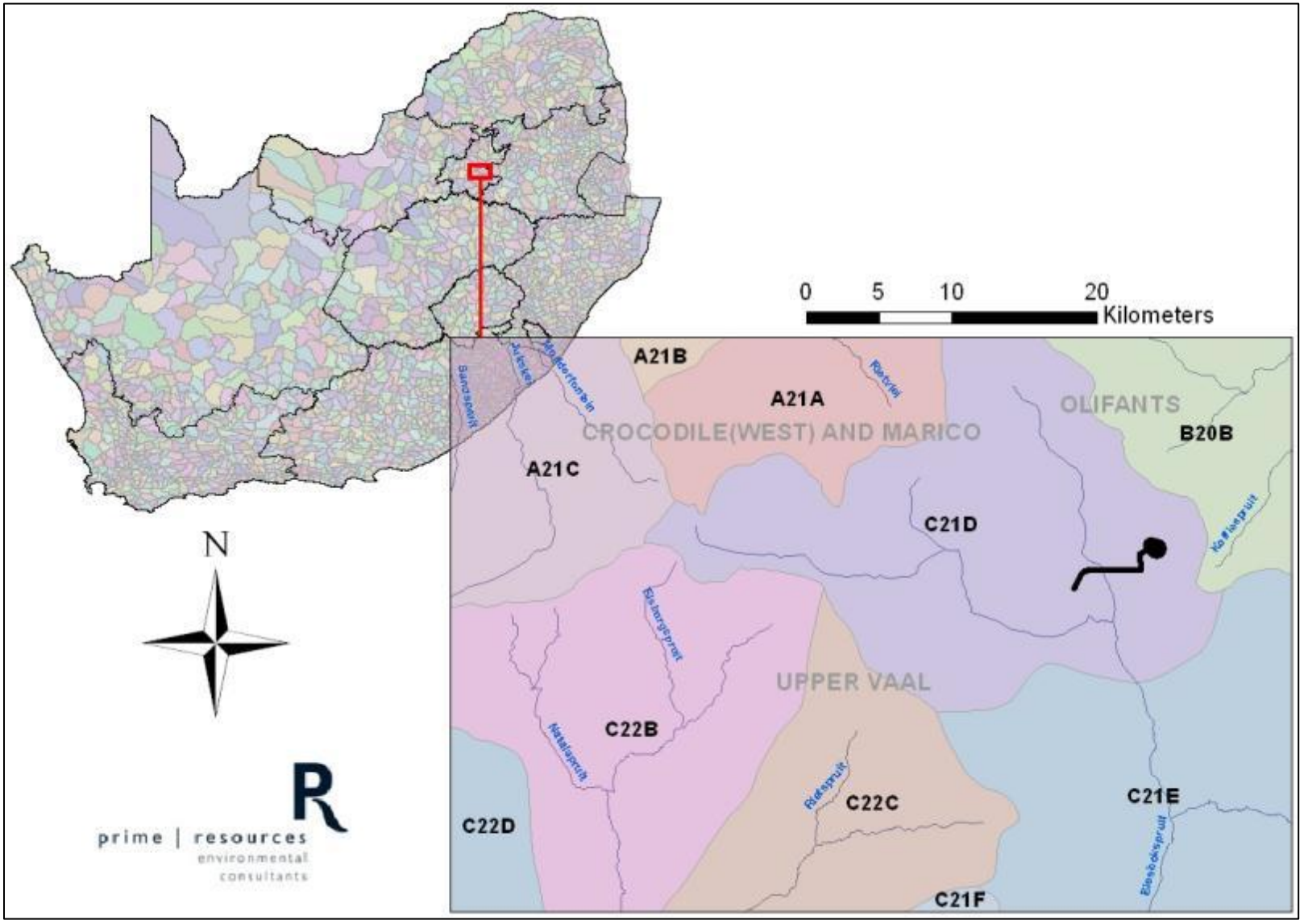


Figure 19: Quaternary catchment and WMA of the project area

50- and 100- Year Flood Lines

To determine the amount of total surface run-off that would occur in a 50-year flood scenario, a typical design storm with a return period of 50 years, falling over an area of 78.5 km², was modelled (i.e. a theoretical circular-shaped design thunderstorm with a 5 km radius of the project area). The results indicated that 50- and 100-year floods produced discharges relatively close together, thus only the 100-year flood lines were plotted. A total volume of 1 699 633 m³ would occur as surface run-off over a 24-hour period produced by a 50-year storm, flowing off natural veld in Veld Zone 4 (Grasslands of Interior Plateau) at the Holfontein Project area. This equates to 21.7 litres per m² of surface area of natural veld (i.e. the current situation). The runoff will be altered depending on the ultimate surface types constructed on site.

The 100-year flood lines modelled indicate that the culvert under the railway line running through the Welgedacht smallholdings has adequate capacity to handle the discharge of a 100-year return period storm. The floodlines are represented in Figure 20.

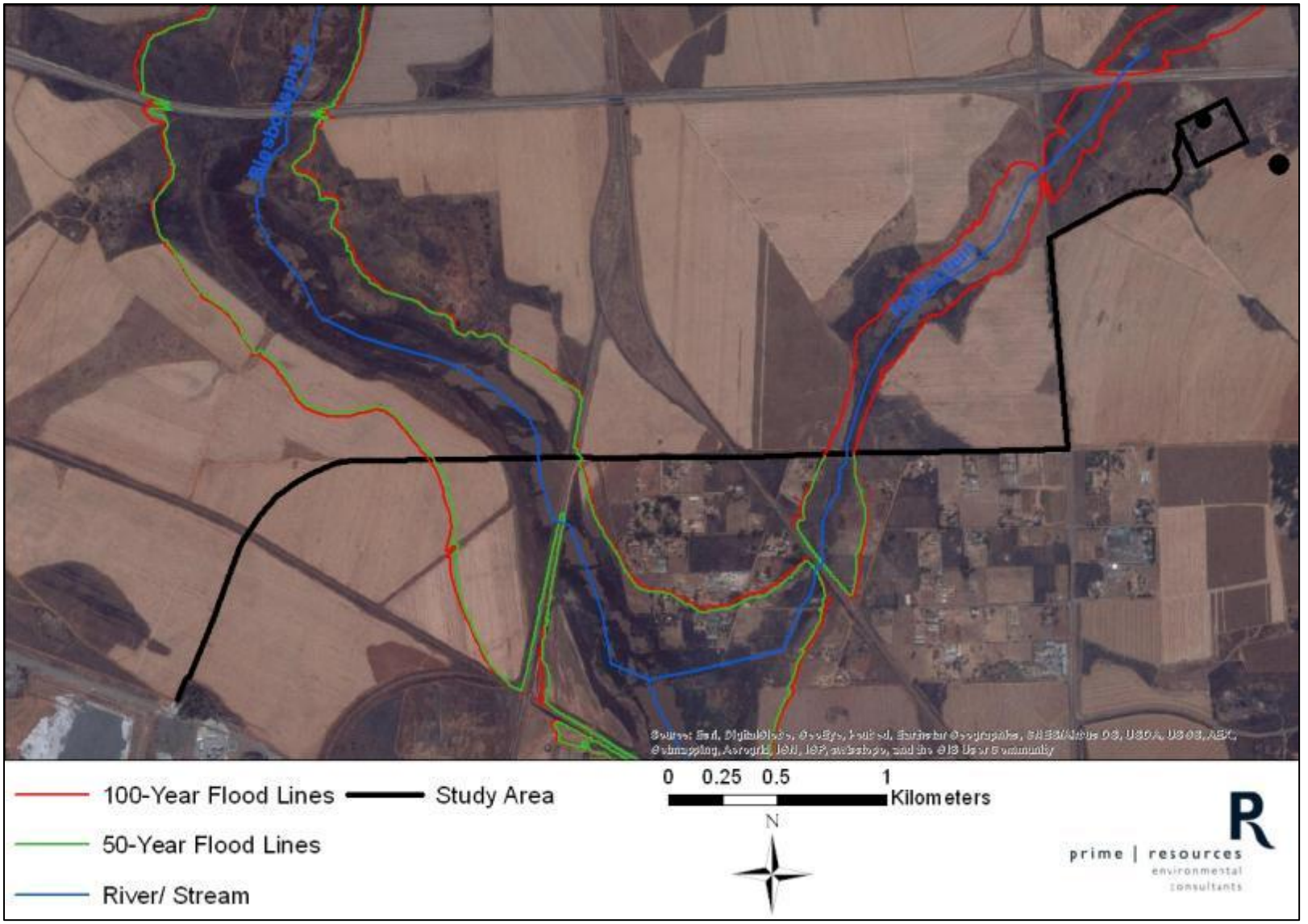


Figure 20: Floodlines for the Blesbokspruit and Holfontein Stream

Surface Water Quality

Four samples, upstream and downstream of the project area, were collected for the baseline water quality analysis. The results of the analysis were compared with the South African National Standard, SANS 241:2011 – Edition 1.0 (the official South African drinking water standard).

Table 2: Water quality baseline results for the samples collected upstream and downstream of the project area

Holfontein Surface Water Samples on 03/03/2015						Holfontein Mine Water 20/11/2014	SANS 241: 2011	
Sample ID → Determinant ↓	Units ↓	Holfontein 01	Holfontein 02 (Blesbokspruit)	Holfontein 03	Holfontein 04	Holfontein Shaft*	Standard Limits	Risk
pH	@25°C	9.1	7.8	7.4	7.7	7.9	≥5.0 - ≤9.7	Operational
Conductivity	mS/m @25°C	71	49	27	27	47	≤170	Aesthetic
TDS	mg/l	501	346	191	191	332 (Calculated)	≤1200	Aesthetic
Total Hardness	mg/l CaCO3	102	167	84	109	208 (Calculated)		
Total Alkalinity	mg/l CaCO3	120	194	90	83			
Sulphate	mg/l	60	<40 (6)	<40 (9)	<40 (37)	54	250 and 500	Acute Health: ≤500 Aesthetic: ≤250
Nitrate	mg/l N	<0.5	<0.5	<0.5	1.5	2.33	≤11	Acute Health
Chloride	mg/l	94	35	18	<5.0		≤300	Aesthetic
Ammonia	mg/l N	3.5	2.7	2.2	1.8		≤1.5	Aesthetic
Calcium	mg/l	21	42	20	32	41.33	<150 (SANS 241:2006 Class I)	
Magnesium	mg/l	12	15	8.2	7.1	25.33	<70 (SANS 241:2006 Class I)	
Sodium	mg/l	83	37	16	7.2	21	≤200	Aesthetic
Potassium	mg/l	17	9.3	3.9	5.2	4.33	<50 (SANS 241:2006 Class I)	
Uranium	µg/l	0.98	0.39	0.16	0.5		≤15	Chronic Health
Aluminium	µg/l	69.9	26	28	369		≤300	Operational
Antimony	µg/l	0.4	0.046	0.05	0.27		≤20	Chronic Health
Barium	µg/l	22	61	100	59			
Beryllium	µg/l	0.03	0.03	0.015	0.018			
Bismith	µg/l	0.002	0.001	0.002	0.003			
Cadmium	µg/l	0.01	0.03	0.02	0.003		≤3	Chronic Health
Chromium	µg/l	0.09	<0.001	0.1	1.8		≤50	Chronic Health
Cobalt	µg/l	0.3	0.3	1.36	0.2		≤500	Chronic Health
Lanthanum	µg/l	0.039	0.008	0.04	0.1			
Lithium	µg/l	0.69	1	0.4	0.9			
Platinum	µg/l	0.06	<0.001	0.001	0.002			
Selenium	µg/l	0.38	0.5	<0.001	0.36		≤10	Chronic Health
Tellurium	µg/l	0.4	0.046	0.05	0.27			
Thallium	µg/l	0.01	0.01	0.01	0.029			
Tin	µg/l	0.009	0.009	0.005	0.02			
Titanium	µg/l	0.049	<0.001	0.9	9.7			
Vanadium	µg/l	0.68	0.1	0.1	1.6		≤200	Chronic Health
Manganese	µg/l	5.86	156	1543.6	21.6	2	500 and 100	Cronic Health: ≤500 Aesthetic: ≤100
Iron	µg/l	60	48.8	190	174	170	3 000 and 2 000	Cronic Health: ≤2 000 Aesthetic: ≤3 000
Asernic	µg/l	1.77	0.55	<0.001	0.36	6.3	≤10	Chronic Health
Nickel	µg/l	2.67	0.85	1.8	1.76		≤70	Chronic Health
Zinc	µg/l	0.68	5.69	1.7	2.75	3	≤5 000	Aesthetic
Copper	µg/l	0.68	5.69	1.7	2.75		≤2 000	Chronic Health
Lead	µg/l	0.06	0.26	0.3	0.3	6.8**	≤10	Chronic Health
Mercury	µg/l	0.9	0.79	0.69	0.9		≤6	Chronic Health
Molybdenum	µg/l	0.59	0.1	0.35	1.06			

* (Shango Solutions 2014) ** The Shango report recorded the average Pb as 10µg/l, while it should have been 6.8 µg/l

From the results (Table 2), water quality in the Holfontein Stream and the Blesbokspruit is good, with only the ammonia exceeding the SANS 241:2011 standard marginally in all four of the samples. The highest ammonia concentration was recorded in the sample taken immediately downstream from Holfontein hazardous waste (H:H) landfill facility.

Although not triggering the SANS 241:2011 standard, the very high pH at Holfontein 1 (pH 9.1) is an area of concern. It is assumed that the Holfontein hazardous waste (H:H) landfill facility is responsible for this high pH. The conductivity/TDS, sulphate, chloride, calcium, sodium and potassium at this sampling point were also the highest of the four samples, indicating an impact

from the landfill site. However, none of these determinants actually exceeded the SANS 241:2011 standard limit.

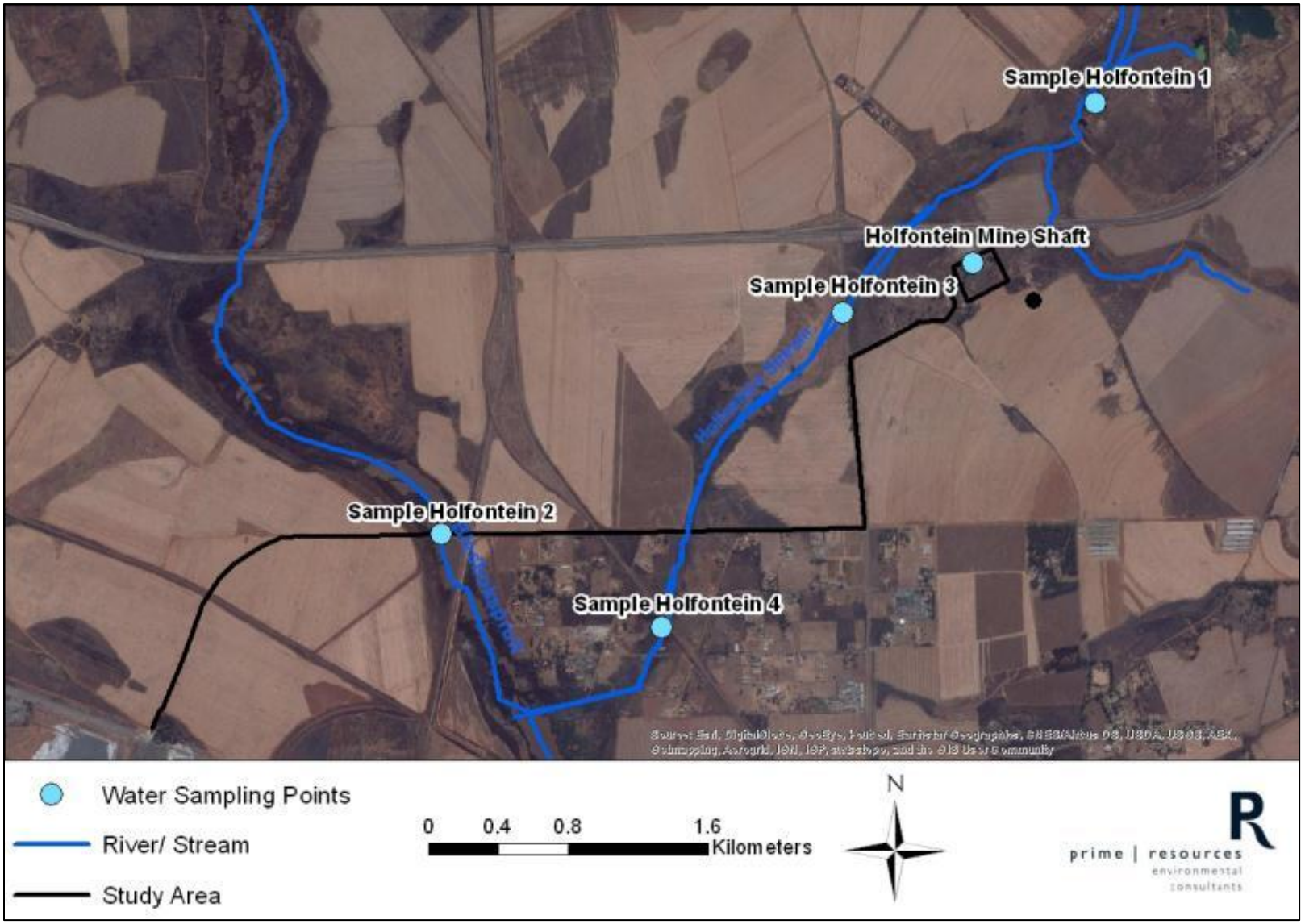


Figure 21: Surface water sampling points

Drainage Density

The drainage density for the Mpuphusi River up to the project area is approximately 0.447 km/km^2 (km watercourse/ km^2 of catchment or"/km"). This is a low drainage density in spite of the rounded shape of the catchment. This is attributable to the very low slope of the catchment.

Surface Water Use

The areas adjacent to the stream near the Holfontein shaft and the proposed surface infrastructure area are used for dry-land maize farming which does not require water from the stream. The only other potential water users of the Holfontein Stream are the riparian plots with riparian rights at the Welgedacht smallholdings and 9 of these smallholdings are considered as being water users.

There is also an old and very small farm dam in the Holfontein Stream on the RE of Ptn 43, which could be considered a water use. However, there are only a few shacks on this portion and no pumping equipment at the dam, which clearly indicates that no water is used from the stream.

vi) Noise

According to the noise baseline study conducted by JH Consulting in April 2015 (attached as Appendix 11) ambient noise measurements were carried out according to SANS Code of Practice 10103:2008 at four locations at or near the project area boundaries (refer to Figure 22).

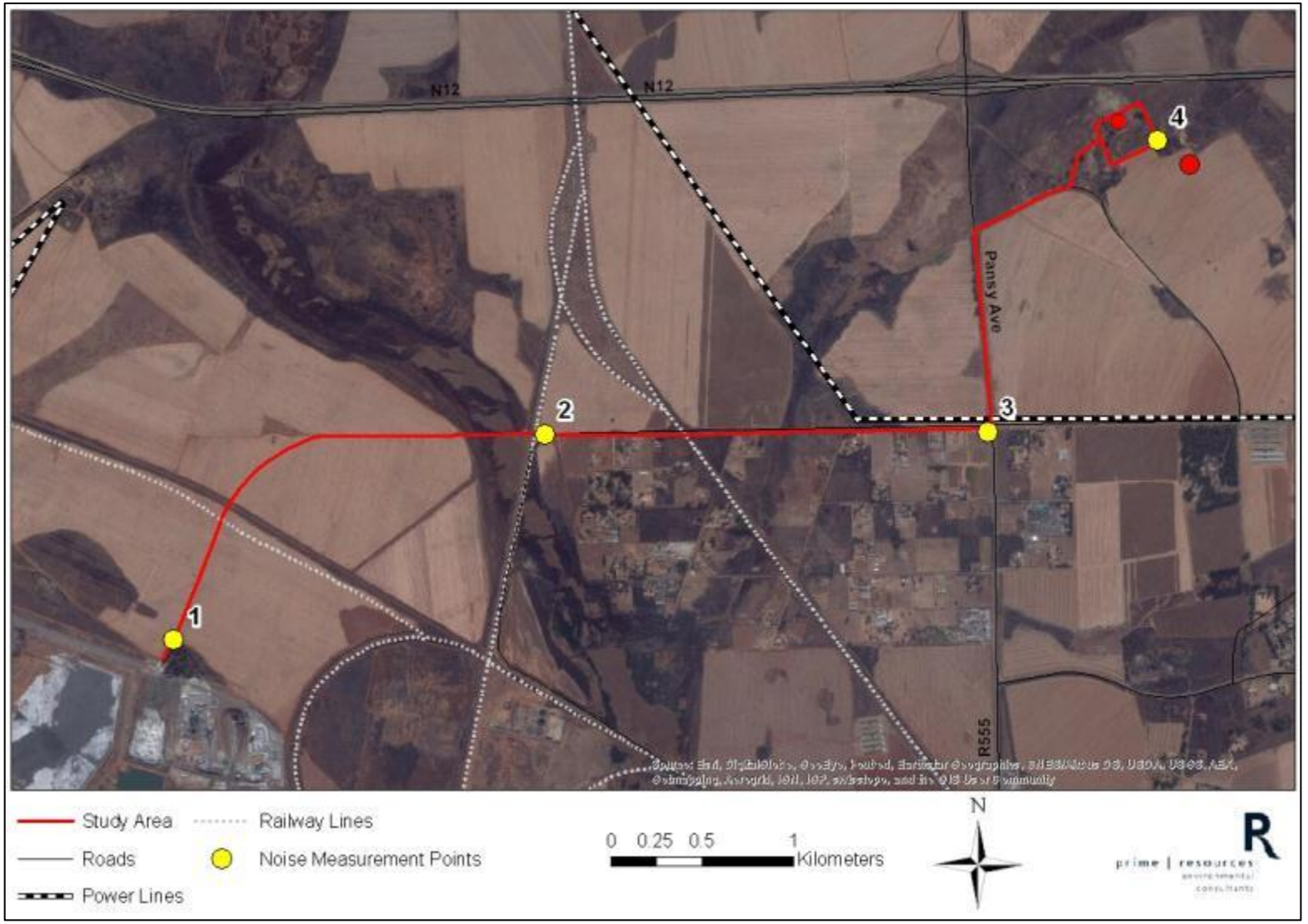


Figure 22: Noise measurement points

Refer to Table 3 for the noise measurements obtained at Measurement Point 1. Noise at this measurement point is generated primarily by the ME processing plant which operates continuously and dominates the background noise. The noise level is therefore consistent throughout the day. The rise in level at the end of the day is likely to be a result of an inversion rather than an actual increase in emitted noise from the plant.

Table 3: Noise measurements taken at Measurement Point 1

TIME	L_{EQ*}	L_{MIN**}
12:21-12:31	48.6	42.6
12:32-12:42	48.1	42.5
12:44-12:54	48.0	42.2
12:56-13:06	52.7	46.6
13:08-13:18	51.2	46.8
17:09-17:19	53.8	49.2
17:20-17:30	55.6	50.5
17:32-17:42	55.3	52.2
17:43-17:53	56.3	50.0
17:55-18:05	57.2	52.5
18:07-18:17	59.7	52.9
23:38-22:48	52.3	45.7
23:50-24:00	53.2	50.4

***Leq = the A-weighted equivalent sound level using the 'I' (Impulse) dynamic response characteristic as recommended in SANS 10103:2008. This is the primary parameter on which assessments are made.**

****Lmin = minimum noise level taken as an expression of the lowest background noise in the absence of intrusive noisy events and random noise events such as pedestrians, animals, birds, and local road or air traffic.**

Measurement point 2 is located on Carnation Road at its turn to the south, 12 m from the centreline of the road. This is part of the proposed haul road. Refer to Table 4 for the noise measurements obtained at this point. Noise at this measurement point is generated primarily by natural sources such as bids, insects, remote traffic and notably from the ME processing plant, 2 km to the south-west, which is audible under most conditions and forms the background noise. Intrusive noise is limited to occasional trains on the adjacent line, as well as vehicles travelling to the Welgedacht WWTW.

Table 4: Noise measurements taken at Measurement Point 2

TIME	L_{EQ}	L_{MIN}
15:10-15:20	51.3	33.8
15:22-15:32	61.7	33.3
15:34-15:44	42.4	33.8
15:45-15:55	49.7	33.8
19:41-19:51	42.6	39.3
19:53-20:03	42.7	39.5
20:15-20:25	42.1	39.8
21:35-21:45	45.7	39.2
21:47-21:57	44.2	39.9
22:00-22:10	58.3	39.6
22:11-22:21	45.0	41.0

Measurement point 3 is located at the southwest corner of the intersection of Pansy Avenue and Carnation road, 20 m from the centreline of the Pansy Avenue and 10 m from the centreline of Carnation Road. Refer to Table 5 for the noise measurements obtained at this point. Noise at this

measurement point is typical of a main road with consistent traffic flow (600-700 vehicles passing per hour) which dominates the noise climate. The residual background noise is mainly from natural sources, primarily from birds, insects, and domestic activities.

Table 5: Noise measurements taken at Measurement Point 3

TIME	L_{EQ}	L_{MIN}
14:35-14:45	68.1	45.8
14:47-14:57	67.4	38.4
14:57-15:07	68.5	43.8
15:09-15:19	66.9	42.4
15:23-15:33	68.1	38.6
15:34-15:44	67.8	42.4
16:10-16:20	67.4	46.2
16:21-16:31	66.9	40.5
16:33-16:43	67.8	46.1
16:45-16:55	69.2	48.6
16:56-17:06	69.8	42.0
19:10-19:20	68.7	48.6
19:22-19:32	68.2	45.2
21:05-21:15	62.0	34.4
21:17-21:27	65.1	38.7
22:25-22:35	60.5	31.3
22:36-22:46	60.5	30.9

Measurement point 4 is located at the south-east corner of the proposed infrastructure area and adjacent to the historic mine hostel, and 300 m from the N12 Highway to the north. Refer to Table 6 for the noise measurements obtained at this point. Noise at this measurement point is typical of a rural area dominated by natural noise, primarily from birds, insects and domestic animals, with some noise from domestic activities in the adjacent informal residences as well as continuous background noise from vehicles travelling on the N12 highway.

Table 6: Noise measurements taken at Measurement Point 4

TIME	L_{EQ}	L_{MIN}
13:46-13:56	45.9	35.0
13:58-14:08	41.7	34.6
14:10-14:20	46.9	38.3
14:22-14:32	42.4	34.6
14:33-14:43	41.4	34.6
16:10-16:20	42.4	37.9
16:22-16:32	42.9	38.4
18:39-18:49	50.7	46.7
18:50-19:00	53.2	49.6
20:35-21:45	52.0	41.2
20:46-20:56	53.9	41.6
22:53-23:03	51.5	40.0
23:04-23:14	51.2	42.1

The noise levels in remote locations, such as the project area, are very low (approximately 40 dB(A)). This represents a typical situation for rural areas (refer to Table 7). Similar conditions would be expected along the proposed haul route, except where it comes within the zone of influence of Pansy Avenue and the ME processing plant.

Table 7: SANS10103 recommended noise level limits for suburban and rural areas

TYPE OF DISTRICT	DAYTIME DB(A)	NIGHT-TIME DB(A)
Rural	45	35
Suburban	50	40

Sensitive Receptors

Sensitive receptors consist of two informal residences to the immediate east and south of the surface infrastructure area as well as the Welgedacht smallholdings along Carnation Road which is proposed to become part of the haul route (refer to Figure 12).

vii) Soil

The following baseline information was obtained from the soil and agricultural / land capability study conducted by Prime Resources in April 2015 (attached as Appendix 12).

Soil Classification

Soils were sampled at four locations, with photographs taken of the soil sampled (refer to Figure 23). The following soil family types were identified: Msinga (Hu1 and Hu2), Mispah (Ms4) and Avalon (Av3) (Table 8).

The dominant soil types near the existing Holfontein shaft comprise of red, brown and greyish soils with low to medium base status.

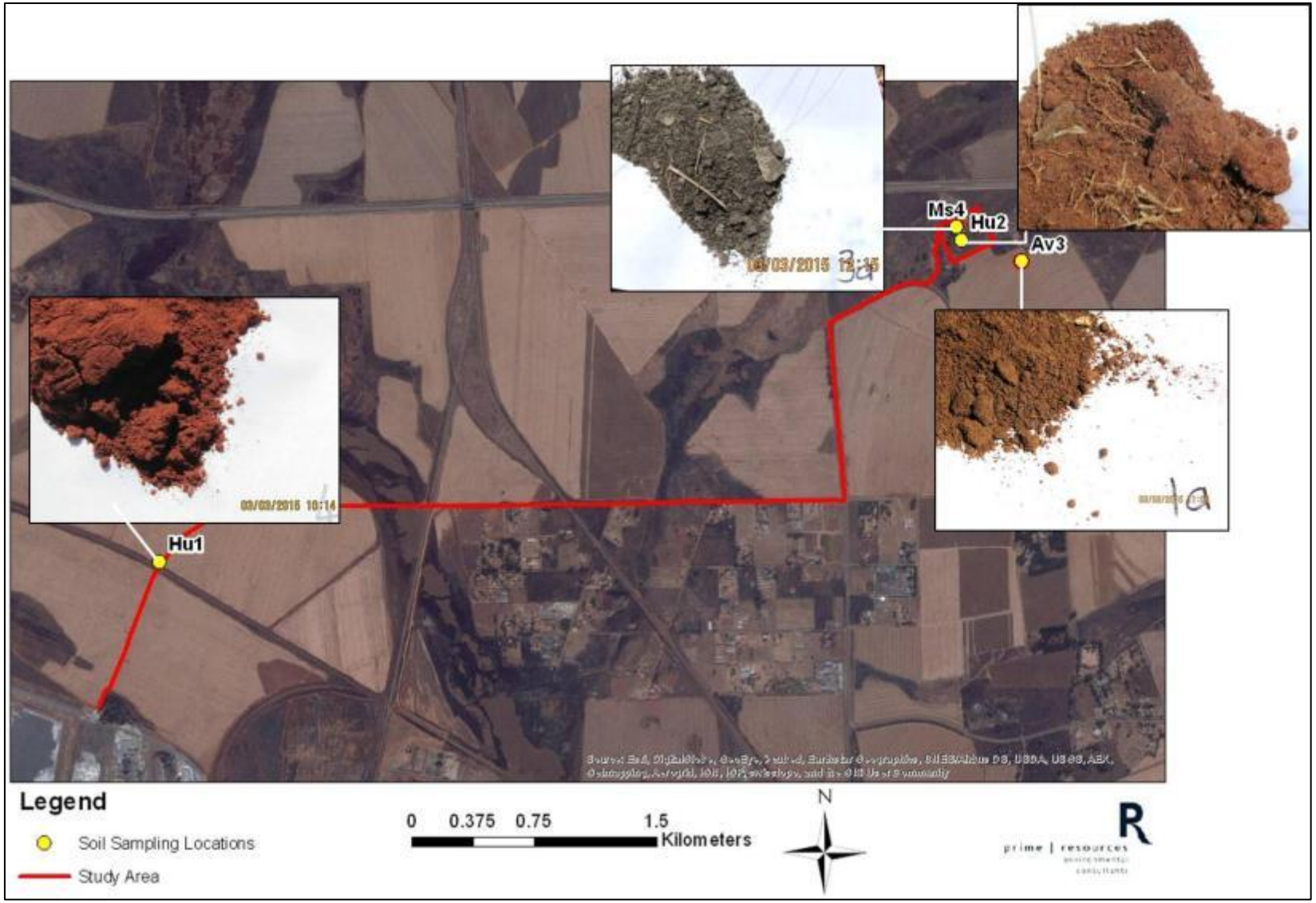


Figure 23: Soil Sampling Locations, soil map units and photographs showing the soil colour

Table 8: Soil classification and description

Map Unit	Dominant Soil Form and Series	Diagnostic Horizon Sequence	Effective rooting depth (mm)	Clay %	Erosion Hazard	Drainage	Description
Hu1	Hutton Msinga	• Orthic (Dark Reddish/ brown loamy sand to clay) • Red apedal B (Reddish/ brown loamy sand to porous non-blocky clay)	500- 700	15 to 35	Low to moderate	Good	• Soft • High Agricultural Potential
Hu2			300-500				• Rocky • Medium Agricultural Potential
Ms4	Mispah Mispah	• Orthic A (Very shallow grey to brown sandy loam to sandy clay loam) • Hard rock	150-300	0 to 15	Moderate to high	Moderate	• Rocky • Low Agricultural Potential
Av3	Avalon	• Orthic A (Dark grey-brown sandy loam to clay loam) • Yellow-brown apedal B (Yellow-brown friable loamy sand to non-structured clay) • Soft plinthic B horizon (Soft iron concretions)	300-600	15 to 35	Moderate to poor	Low	• Soft • Medium Agricultural Potential

The underlying geology of the proposed project area consists of a mixture of three broad types of parent materials. The Holfontein Mine Shaft and Vent Shaft are underlain by sandstone, arenite and shale of the Vryheid Formation (Karoo Sequence). The Vryheid Formation is shale derived from sand deposited on the floor of the inland Karoo Sea. This formation has generally weathered to form brown and yellow-brown topsoils of moderate to good yield potential, which is often determined by the depth of the topsoil.

The haul road is underlain by dolomite and chert of the Malmani Formation (Transvaal sequence) and some diamictite and shale of the Dwyka Formation (Karoo Sequence). The Dwyka Formation, which is older than the Vryheid Formation, formed by the mud deposited on the floor of the inland sea as the ice began to melt at the beginning of the de-glaciation. Soils derived from the Dwyka Formation are usually dark grey or black and can be difficult to manage (especially when wet).The parentage of the soils at the project area according to the 1:250000 Geological Series, 2628 East Rand, is shown in Figure 24 below.

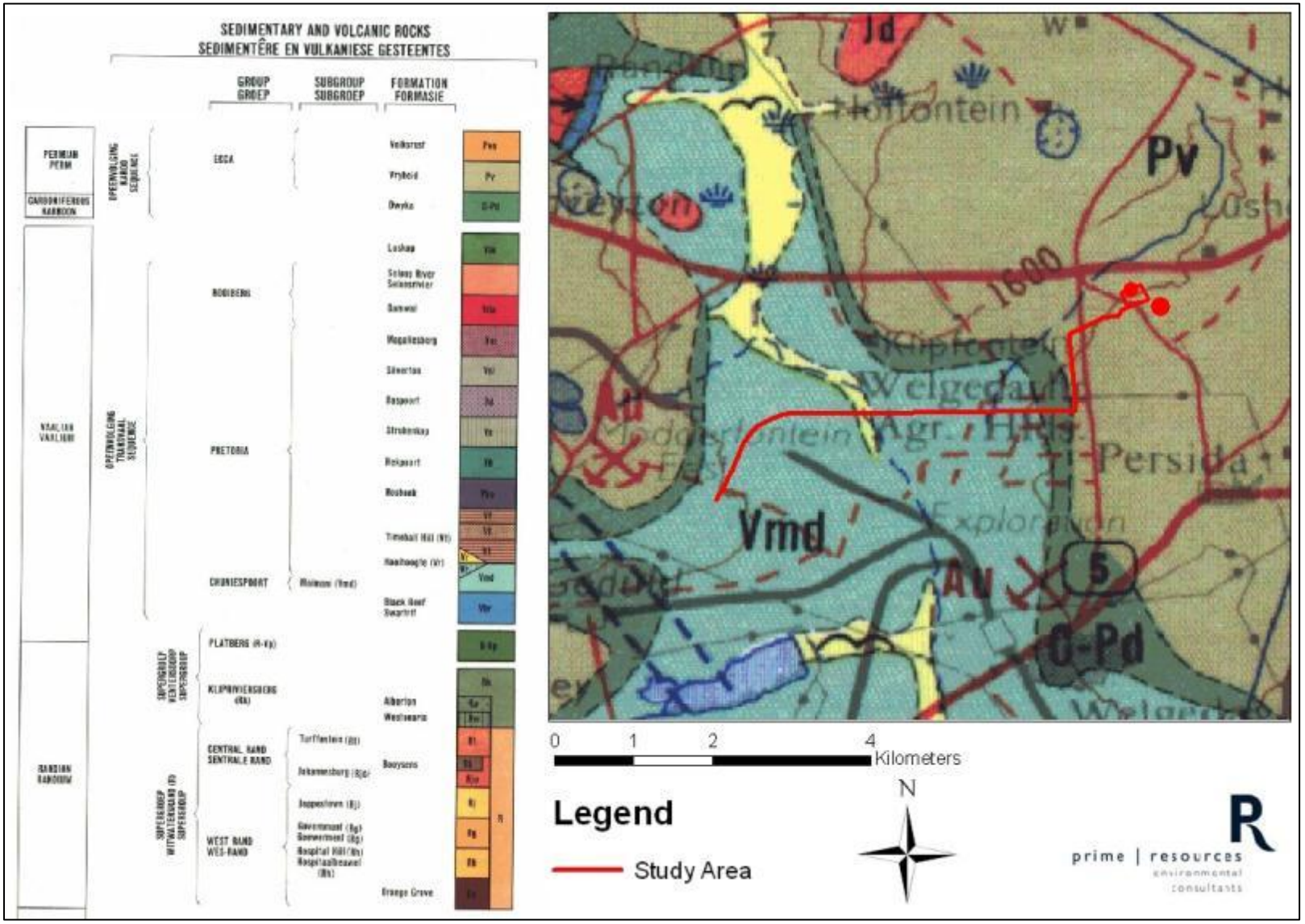


Figure 24: Underlying geology of the project area (1:250000 Geological Series 2628 East Rand)

Land Capability Class

The land capability class takes the % slope, texture, effective rooting depth, permeability and wetness into account. This capability is closely allied to soil yield potential.

The land capability classes identified within the project area are II at Hu 1 (may be used for cultivated crops with some limitations and the management practices are easy to apply), III at Hu2 and Av3 (may be used for cultivated crops but there are severe limitations and the conservation practices are usually more difficult to apply and maintain) and IV at Ms 4 (may be used for cultivated crops but there are very severe limitations and more careful management is required and conservation practices are difficult to apply and maintain; restrictions to land use are greater and the choice of plants is more limited).

Soil Erosion Sensitivity

The soil erosion sensitivity of the sampled soils can be classified as:

- A favourable erodibility index where the land is generally level to gently sloping, with low susceptibility to water erosion (along the haul road);
- A moderate to high erodibility susceptibility, with moderate to high susceptibility to water erosion, which occur along the broad band of slightly sloped land towards a tributary of the Blesbokspruit, north of the Holfontein Mine Shaft and proposed surface infrastructure area. The Mispah soils in this area, where the soils are shallow and can only hold a few millimetres of rainwater and where the vegetation is sparse and cannot arrest or disperse flow, could result in high levels of rainwater run-off during rainfall events;
- Overall, the soils sampled within the project area have a low susceptibility to erosion loss as the soils are not considered to be sodic (i.e. they do not have imbalances in base cations and therefore do not have poor soil structure).

Agricultural Potential

According to the EMM GIS Database the area is classified as high agricultural potential (www.gis.ekurhuleni.gov.za).

The Southern African Agricultural Geo-referenced Information System (AGIS AGRIC) describes soils in this area as a high agricultural and unique dry land area. The project area is split between high potential arable land and moderate potential arable land (refer to Figure 25).

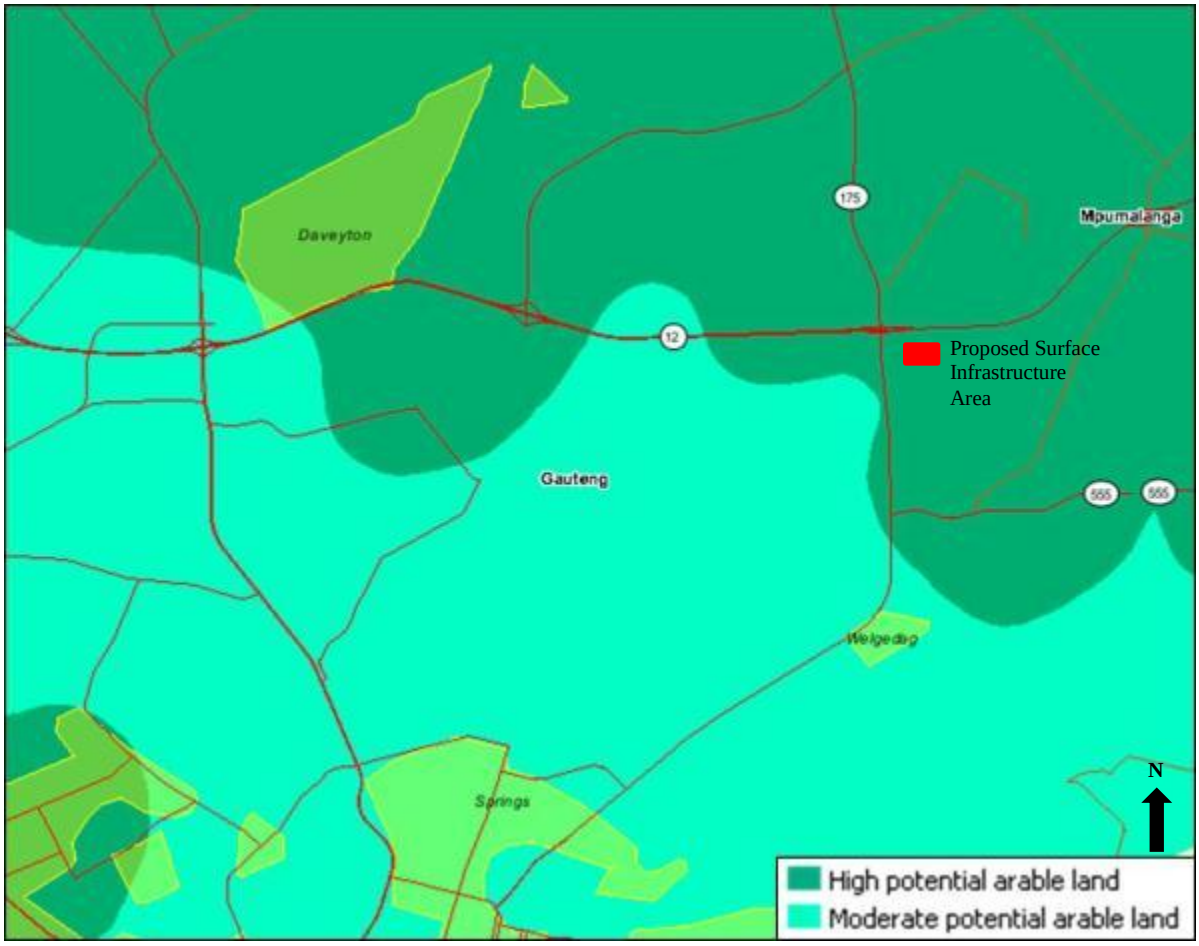


Figure 25: Land Capability (AGIS AGRIC 2012)

From the Gauteng 1:50 000 Soil Survey of the Broad Agricultural Potential, the agricultural potential of the project area ranges from low to high (refer to Figure 26). The Broad Agricultural Potential is derived from a combination of soil form, depth, texture and drainage. The area around the Holfontein shaft is classified as having a high agricultural potential.

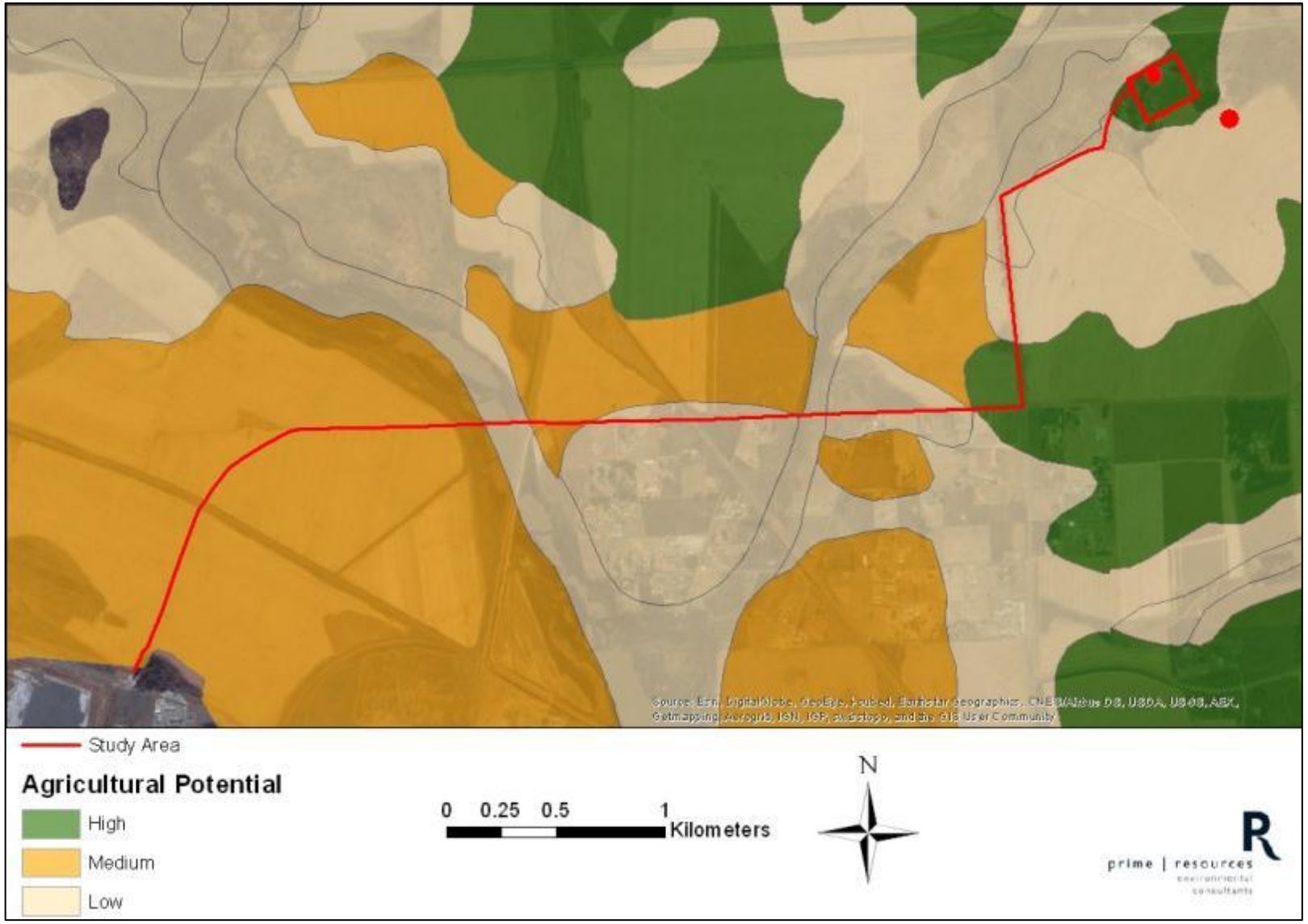


Figure 26: Gauteng 1:50 000 Soil Survey showing the agricultural potential of the project area

Although the footprint around the Holfontein Mine Shaft is classified as having a high agricultural potential in terms of the above databases, from the site observations, the land capability class (III and IV) determination and the results of the soil classification and soil sample analyses, it was found that the soil quality has been impacted by the previous mining practises of the area. Therefore the area is not suitable for agriculture. The ground in this area is compacted and has been exposed to wind and water erosion over a long period of time, the area is also impacted by slight contamination (As, Cu, Pb).

The surrounding areas comprise farmlands and this was confirmed during the in-field assessments. Maize is grown in the area classified as having a medium agricultural potential (area along which the haul road will run) and soya bean is grown in the area classified as having a low agricultural potential (area where vent shaft will be located).

viii) Social

The following information was obtained from the social baseline study currently being conducted by Prime Resources.

Socio-Economic Overview

The EMM was established in 2000, and covers an extensive geographical area. Former local administrations of the nine towns in the East Rand – Alberton, Benoni (including Daveyton and Etwatwa), Boksburg, Brakpan (including Tsakane), Edenvale/Lethabong, Germiston, Kempton Park/Tembisa, Nigel (including Duduza) and Springs (including Kwa-Thema) – were amalgamated into the new metropolitan municipality, along with two other councils – the Khayalami Metropolitan and Eastern Gauteng Services Councils.

The Project is located in Region C of the EMM, which is on the Eastern side of Gauteng Province. Region C includes Benoni and Daveyton and is characterised by open spaces, consisting of environmentally sensitive areas and agricultural land. The Regional Spatial Development Framework (RSDF) indicated that Region C is largely allocated to future urban development and agriculture. The main access routes in Region C include the N12 highway, and the R50, R51 and R25 regional routes. The shaft area falls within Ward 67 and the road runs over both Ward 67 and 72 of the EMM, however no social receptors were identified within Ward 72.

Socio-Economic Challenges

The Integrated Development Programme (IDP) highlights the following core socio-economic challenges currently facing the EMM:

- Systemic poverty and inequality: certain interventions such as social grants and indigent support have been implemented in EMM but further integration with other development interventions (such as small business development) is required;
- Food scarcity: poverty in cities is linked to lack of food, as food is a cash commodity. Social support food networks within EMM need to be further explored;
- Inadequate human capabilities development: such as lack of investment into economic and social skills development, which is currently the sole responsibility of formal education

institutions but not always sufficiently dealt with by these institutions and excludes anyone not enrolled in such an institution;

- Lack of integration in child and family development: current early childhood development programmes are not linked to family development, this lack of integration results in inconsistent and sometimes ineffective social development;
- Inadequate youth development: this development programme is largely focused on unemployment. It also needs to focus on social development and support for various youth categories; and
- HIV / Aids: EMM has high HIV/Aids infection levels. The current programme has largely been focused on treatment. It needs to also be focused on lifestyle choices and education

There is a high demand for residential and mixed land uses in Region C, emphasising the need for housing provision and retail uses to meet the local community's needs. According to the Council for Scientific and Industrial Research (CSIR), sustainable human settlements cannot be achieved without adequate social facilities that are differentiated according to varying development densities, community size, mobility levels and socio-economic variation.

Region C is experiencing a shortfall in educational, recreational, healthcare and community services. In Region C there are 519 erven (portions of land) zoned for social and community facilities, of these 330 erven are currently undeveloped. The problem in terms of the provision of social and community facilities is therefore not the availability of land for these facilities but rather the physical development of these facilities.

Ward 67 is divided into 7 voting districts. The shaft area falls within the Vukucinge Primary School voting district, and the Ward Councillor and the Gauteng Department of Agriculture and Rural Development (GDARD) have identified the following challenges facing this voting district:

- Sewer spillages;
- No running water;
- No formal sanitation;
- Over-population;
- High level of crime;
- High rate of unemployment;
- Irregular or no electricity supply;
- Absence of a Secondary School;
- Negative and unmitigated effect of heavy flooding during rainy season;
- Poor response from ambulance or emergency service;
- Residents have to walk to local clinics in Etwatwa or Slovo Park;
- Residents do not have Identity Documents (IDs) because they are foreign nationals from Lesotho and Zimbabwe thus cannot receive state grants; and
- The original owners of the Reconstruction and Development Programme (RDP) houses are not easily located. Most of the houses have been left with relatives or strangers.

Statistical Profile of Ekurhuleni Metropolitan Municipality

EMM has a total surface area of 1,975 km² that accommodates a population of 3,178,470 million. EMM is spread over 15.6 % of Gauteng's land mass, houses 5.4 % of the country's population, and 25.5 % of Gauteng's population. Migration into the area is a key challenge. This is visible in the number of informal settlements and informal trading activity. The economically active people constitute 41.5 % of the population. The area contributes approximately 6.1 % to national production. Over the period 1996 to 2011, Ekurhuleni's economy grew by an estimated average of 3.2 % per annum.

Age and Gender

The 2011 census indicated that the EMM has a largely adult population with majority of the population distribution being between 25 and 29 (387,087 people), and unlike Gauteng, EMM has a more male-dominated (206,472 men) population (compared with 180,575 women). EMM has a decreasing population growth rate, as do all Gauteng municipalities.

Education and Employment

EMM education statistics have improved over the last 16 years, with a steady increase in the percentage of people completing Grade 12 and obtaining higher education. Although the unemployment rate increased from 1996 to 2001, it decreased by 11.6 % from 2001 to 2011.

Household Utilities

The percentage of households with electricity for lighting increased by approximately 7 % from 1996 to 2011, while the percentage of households with electricity for cooking increased by approximately 15 % from 1996 to 2011. The percentage of households with access to piped water within their dwelling / yard increased by approximately 3 % from 1996 to 2011, as did the percentage of households with access to flush / chemical toilets.

Informal Settlements

According to the Census there has been a significant increase in the number of households living in formal dwellings in Ekurhuleni since 2001. The number of households living in informal dwellings (shacks) has decreased by 25,211 over the ten year period 2001 to 2011 and the proportion of households living in informal dwellings (shacks) has declined considerably from 22 % in 2001 to 14 % in 2011. According to the 2011 Census, roughly 30 % of households living in informal dwellings (shacks) in EMM regard themselves as owners, with a considerable 44 % who stated that they occupy the dwelling for free. 21 % of households stated that they rent their dwellings.

While the EMM achieved an increase in the percentage of households supplied with basic services (such as running water, formal sanitation and electricity), on average access to basic services within informal settlements did not improve significantly between 2001 and 2011.

Statistical Profile of Region C and Ward 67

Region C accommodates a total population of 401,270, while Ward 67 accommodates 37,500 of that. There are estimated to be 134,000 households within Region C with a population density of 403

people per km^2. The ratio of males to females is 1:1 and the predominant age category is 0-4 years, unlike that of the greater EMM which has a predominant age group of 25 to 29.

The RSDF identified that Region C has a relatively low average population density due to majority of the region's land remaining unoccupied because of a lack of living and work opportunities in the central and northern parts of the region. In 2012, 37.1 % of the region's total population was living in poverty; a significantly higher percentage than that of the greater EMM. The social facilities in Region C are concentrated in the built-up areas, and they appear to be in line with the requirements; however the Governance Report for Ward 67 highlights areas within the Ward where informal settlements are still greatly lacking in basic services and infrastructure.

Socio-Economic Profile of the Project Area

The following receptor communities were identified:

- The Khomponi Community, living at the existing historical Holfontein mine; and
- The residents living within the Welgedacht SH along Carnation Road.

The locations of these communities were mapped in order to better understand their proximity to the proposed project components. The living conditions and household conditions of the communities were further described and depicted through accompanying below.

The Khomponi Community

The Khomponi community are living within the historical mine hostel and house, as well as informal dwellings in proximity to the hostel and house (Figure 27). This community has an estimated population of 200 to 250 people. The hostel is made up of 4 housing blocks (see Photo 1 below) which are home to 33 households, while the house is home to 3 households. There are 8 informal dwellings surrounding both the house and hostel. Members of this community first settled in the area 35 years ago. The majority of the residents are from Gauteng, however there are also residents originating from Mpumalanga, Limpopo and Mozambique. The main language spoken is Zulu but residents from Limpopo speak Pedi.

A few of the older residents receive pensions through the South African Social Security Agency (SASSA) but the majority of them cannot apply for pensions as they do not have IDs. Similarly, a few of the women receive child grants but many do not as they do not have IDs. The mobile clinic does not visit the Khomponi community as it is considered too small and the nearest clinic is in Slovo Park, approximately 5 km away. There is a small tuck shop within the hostel, run by one of the residents, however the nearest formal shops and police station are in Sundra (approximately 7km walking distance).

Age and Gender

The community ranges from ages of 1 to 71, and the older members of the community appear to be financially supported by the younger adults. The majority of the younger women have small children. The male to female ratio appears to be 1:1.

Education and Employment

Approximately 50 % of the working males (20 and older) have piece jobs (ad hoc) on local farms or in local industry. None of them have permanent or contracted employment. A small percentage of the older women have employment in Sundra as domestic workers.

Approximately 20 of the children attend primary and secondary school in Sundra (which falls into Ward 7 of the Victor Khanya Local Municipality, Mpumalanga). The children walk down the unpaved road and wait for a school bus which collects them from Pansy Avenue. Approximately a third of the adults have completed Grade 10, 11 or 12.

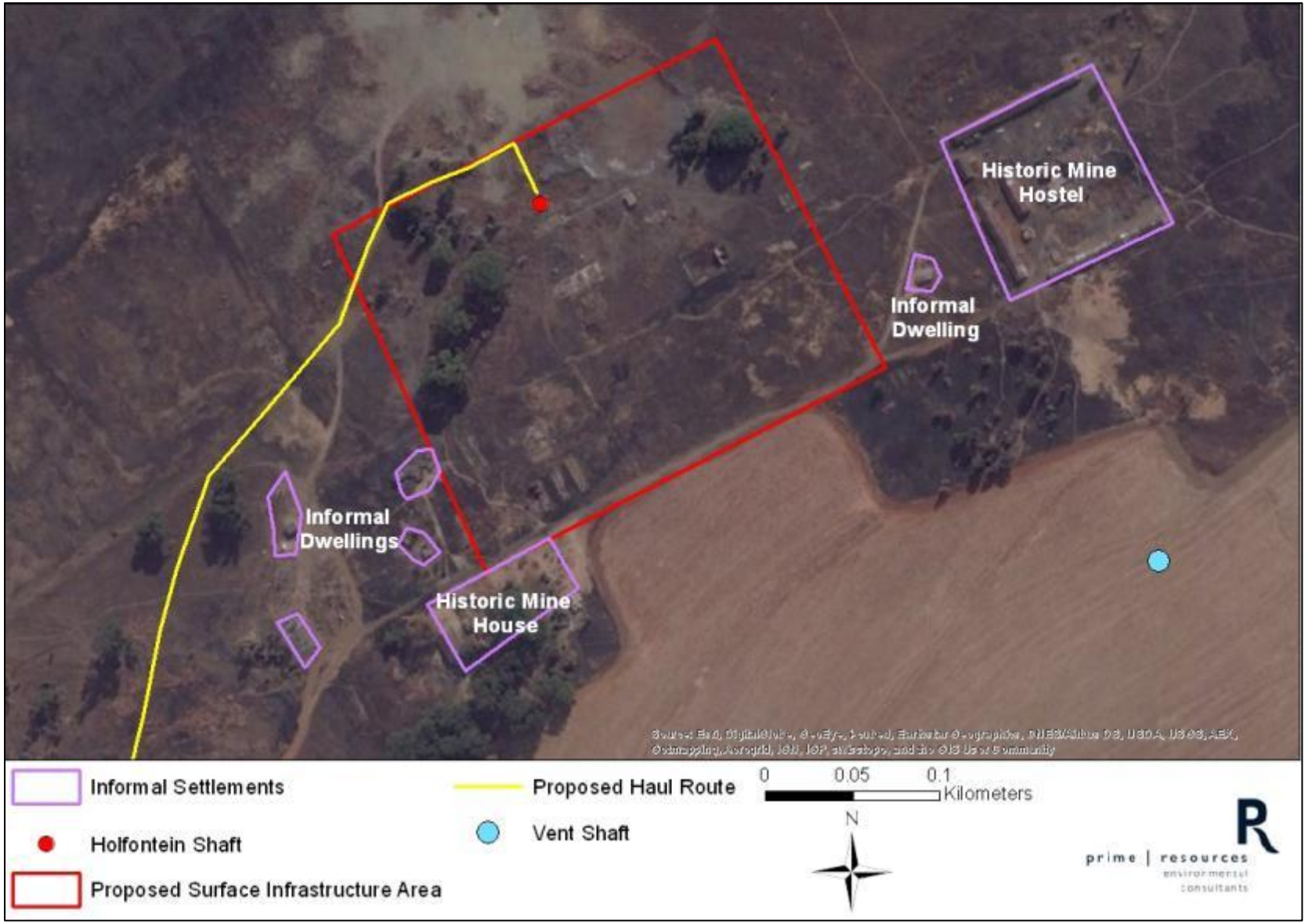


Figure 27: The Khomponi Community dwellings, surrounding the Holfontein shaft area

Household Utilities

The community has no running water, formal sanitation or electricity. A large Jo-Jo water tank is filled weekly by a private company (see Photo 8), however this tank is not cleaned which poses a health risk to the community. The community have been provided with three chemical toilets by Kharki Toilet Hire (see Photo 5). Two toilets are located at the hostel and one at the house. Non-ventilated pit latrines are also utilised. The chemical toilets are emptied once a week. The community members use candles for lighting, paraffin for cooking and wood for heating (see Photos 2 and 3).

Sense of Place

The Khomponi community members consider themselves to be a peaceful community, and did not report any major incidents over the last year. It was reported that criminals occasionally hide stolen goods in the grass surrounding the community. The community members added that when approached, these criminals have become threatening towards residents and as a result most of the residents avoid being outside at night.

The hostel and house were observed to be in poor condition and the residents expressed concerns with regard to leaking roofs, especially during the rainy season (see Photo 1). Subsistence farming is undertaken on a small scale to grow pumpkins and maize for food (see Photo 6). Although the basic service provision needs of the community are being met they are still considered an informal settlement, as they do not have access to running water, electricity or formal sanitation. However, it should also be noted that this community is well established. They have created a functional home for themselves and expressed concern about being relocated and / or losing their homes.

Photo 1: A housing block at the hostels.

Photo 2: Cooking on a paraffin stove.

	
Photo 3: Wood stockpile at the hostel.	Photo 4: Washing clothing in a wheel barrow.
	
Photo 5: Chemical toilet at the hostel.	Photo 6: Small scale subsistence farming is undertaken at the hostel.
	
Photo 7: The central building near the hostel blocks, which is used as a church.	Photo 8: The Jo-Jo water tank located at the hostel, in the centre of the complex.

The Welgedacht Small Holdings

The Portions 1 to 7 and 49 to 62 located along Carnation Road were observed to be either privately owned residences, businesses or open land (Figure 28). The table below provides a description:

Table 9: SH identified along Carnation Road

PORTION NO.	DESCRIPTION
1	Owned by the East Rand Water Care Association (ERWAT) who run the Welgedacht WWTW, which treats up to 35 Mℓ/d
3	Private residence
4a and 4b	Subdivided property. A business: The Roofwarehouse (Pty) Ltd
7	Open Portion
48	Private Residence
49	Private residence. Social worker Amanda Koen runs a business from this residence.
50	Open Portion
51	Business: Coad in Springs
53	Open Portion
54	Both a private residence and a business. The residence at the front of the property is occupied by De Vries Syn Kinze while a refrigerator servicing company operates on the opposite side of the property
55	Open Portion
56	Havilah Guest House
62	Petrochemical Installation Specialists

Some of the open portions of land had livestock (cows and/or sheep) grazing on them and so may be used for subsistence farming practices.

Age and Gender

Due to the difficulties encountered in contacting private resident and business owners along Carnation Road no data could be obtained with regard to age and gender.

Employment and Education

The private residences were large and well looked after, with well-maintained gardens and significant security. Some of the homes had solar panels and at least 3 or 4 of the properties had dogs. It can thus be inferred that most private resident owners either run their own businesses from home or are employed elsewhere and are medium to high income earners. Unfortunately no information could be obtained regarding education levels.

Household Utilities

The houses and businesses likely have access to running water on their properties, as well as formal sanitation and electricity.

Figure 28: Welgedacht SH located along Carnation Road (hatched)

ix) Terrestrial Ecology

According to the terrestrial ecology baseline study conducted by SEF in April 2015 (attached as Appendix 14), the project area falls within the Grassland Biome, and comprises of two vegetation types. The proposed shafts as well as the eastern section of the proposed haul road are located in the Eastern Highveld Grassland vegetation type (classified as Endangered), while the remainder of the haul road is located in the Soweto Highveld Grassland vegetation type (also classified as Endangered). Eastern Temperate Freshwater Wetlands are associated with the Blesbokspruit and are located north and east of the haul road (refer to Figure 29). These vegetation types are further comprised of vegetation units (refer to Figure 30).

The National Environmental Management: Biodiversity Act, No. 10 of 2004 (NEMBA) provides for listing threatened or protected ecosystems. The proposed shaft and portion of the haul road falls into the Blesbokspruit Highveld Grassland ecosystem which is currently listed as Critically Endangered, while the remainder of the haul road is located in the Soweto Highveld Grassland ecosystem which is currently listed as Vulnerable (refer to Figure 31).

According to the Gauteng C-Plan V3.3 (2011) various areas which are associated with the Holfontein Project have been listed as Important due to the presence of suitable habitat for Red and Orange Listed plant species, Red Listed mammal species, Red Listed bird species as well as the presence of primary habitat (refer to Figure 32).

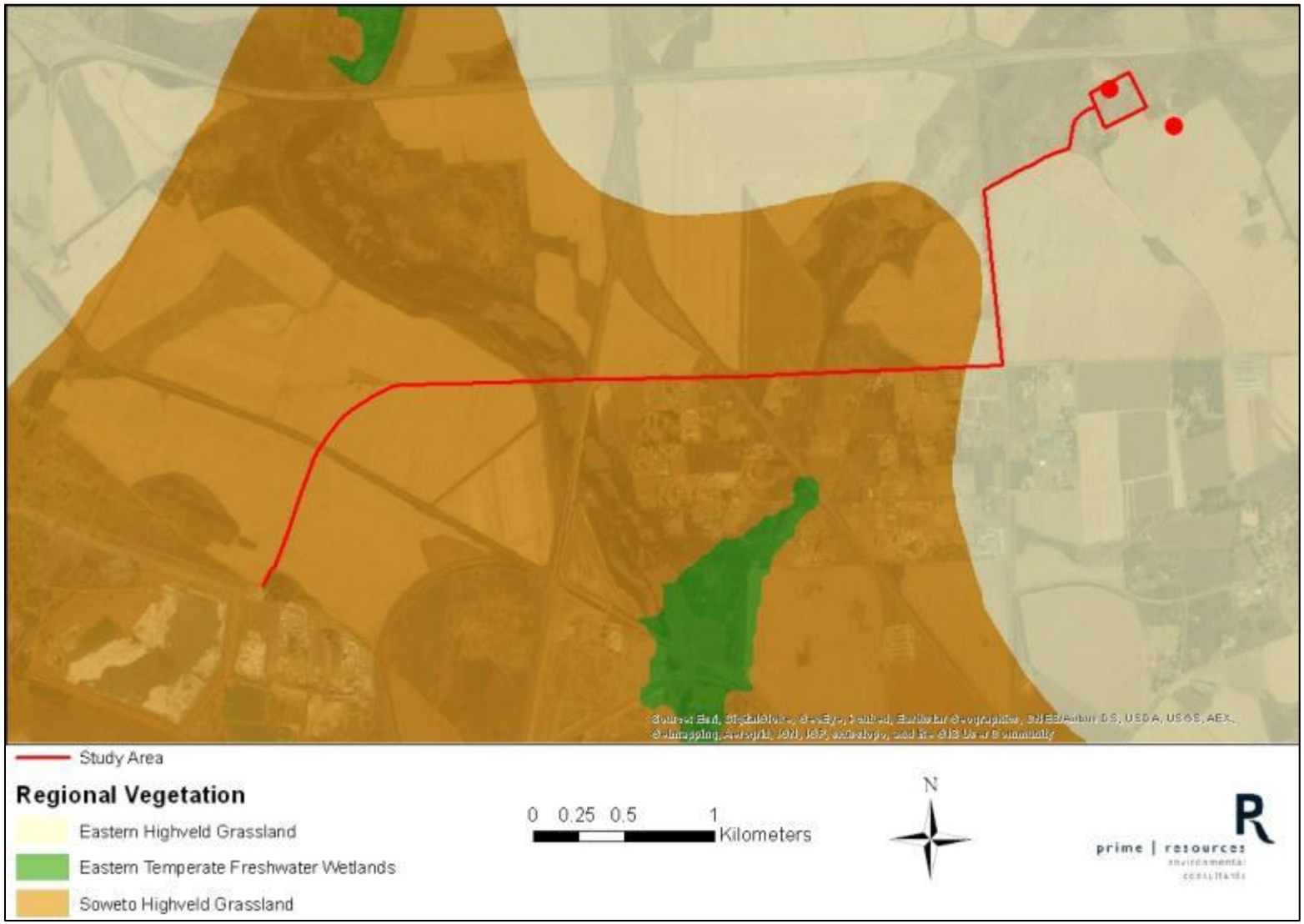


Figure 29: Regional vegetation within the project area (SANBI- BGIS)

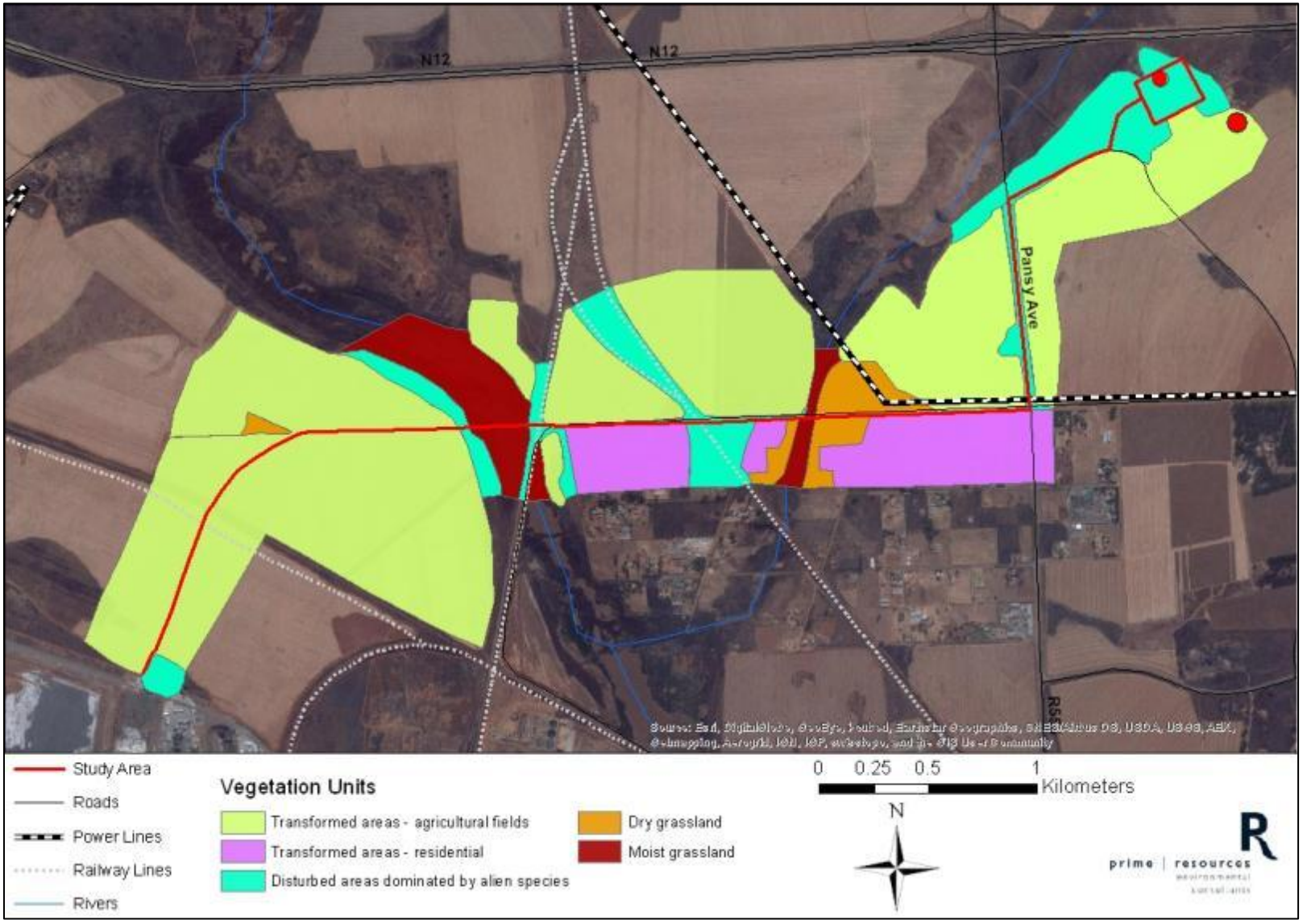


Figure 30: Vegetation units within the project area (SEF, 2015)

Figure 31: Ecosystems within the project area (SANBI-BGIS, NEMBA)

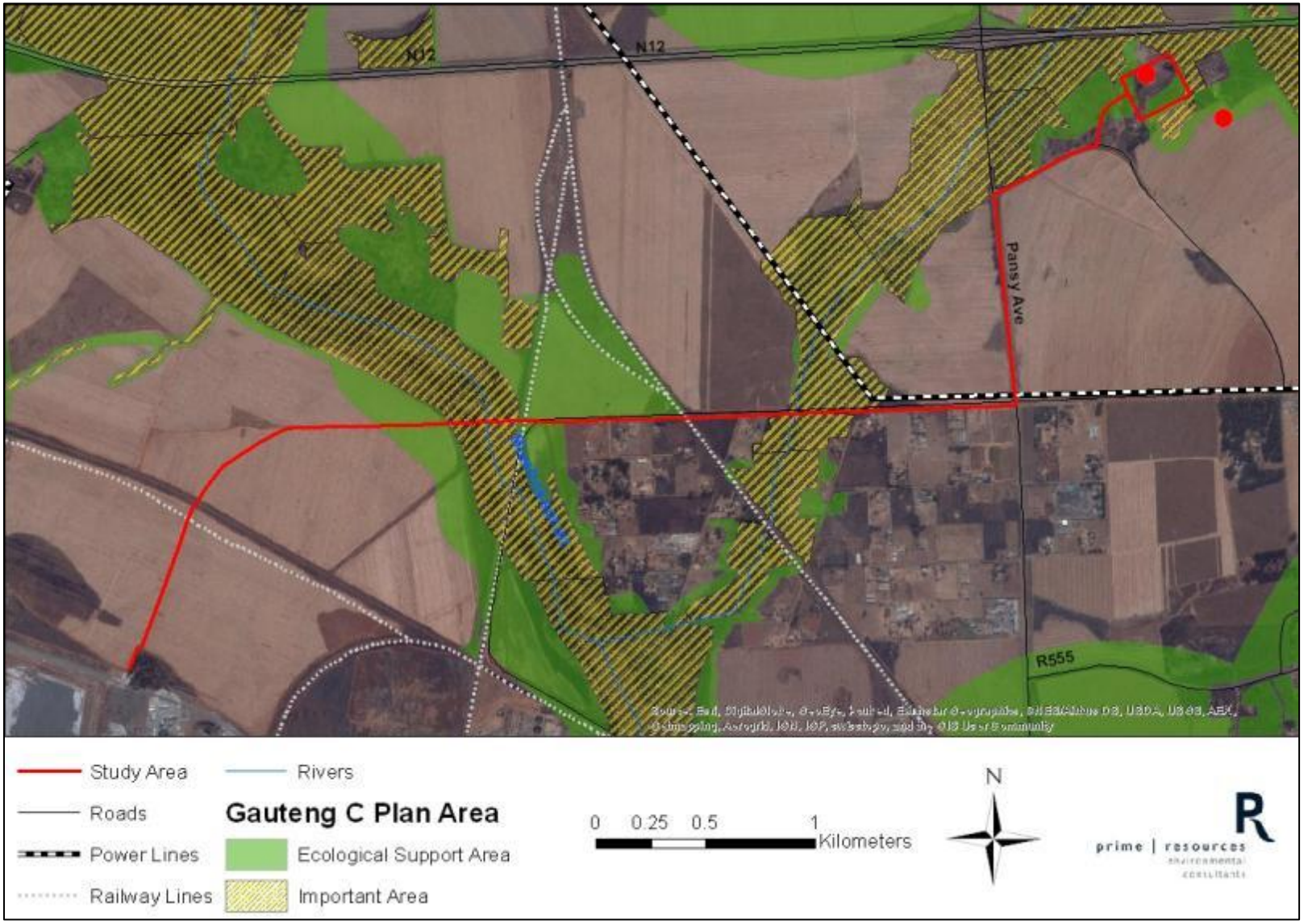


Figure 32: Areas identified in the Gauteng Conservation Plan (V3.3, 2011)

Plant species of conservation concern identified within the area include *Hypoxis hemerocallidea* and *Kniphofia typhoides* (currently listed as Near Threatened) identified in the dry grassland and *Crinum bulbispermum* (currently listed as Declining) confirmed adjacent to the Blesbokspruit in the moist grassland (refer to Figure 33).

The grassland also provides suitable habitat for at least two mammal species of conservation concern namely *Atelerix frontalis* (South African Hedgehog; currently listed as Near Threatened), and *Leptialurus serval* (Serval; currently listed as Near Threatened). The moist grassland provides suitable habitat for mammal species of conservation concern such as *Leptailurus serval* (Serval; currently listed as Near Threatened) and *Dasymys incomtus* (African Marsh Rat; currently listed as Near Threatened) and the Blesbokspruit also supported healthy populations of the rare butterfly, *Metisella meninx* (Marsh Sylph) (refer to Figure 33).

The Blesbokspruit Important Birds and Biodiversity Area (IBA) is also located approximately 10 km south of the Holfontein project area.

The site was assessed in terms of its conservation importance from a biodiversity (floral and faunal) perspective, as well as the ecological sensitivity and connectivity to other natural areas of the site to the proposed activity. Findings indicated that the proposed infrastructure falls within disturbed and transformed areas classified as having a low ecological sensitivity. Only portions of the existing road to be used as the haul road intersect dry and moist grasslands which are classified as having medium to high ecological sensitivity (refer to Figure 33).

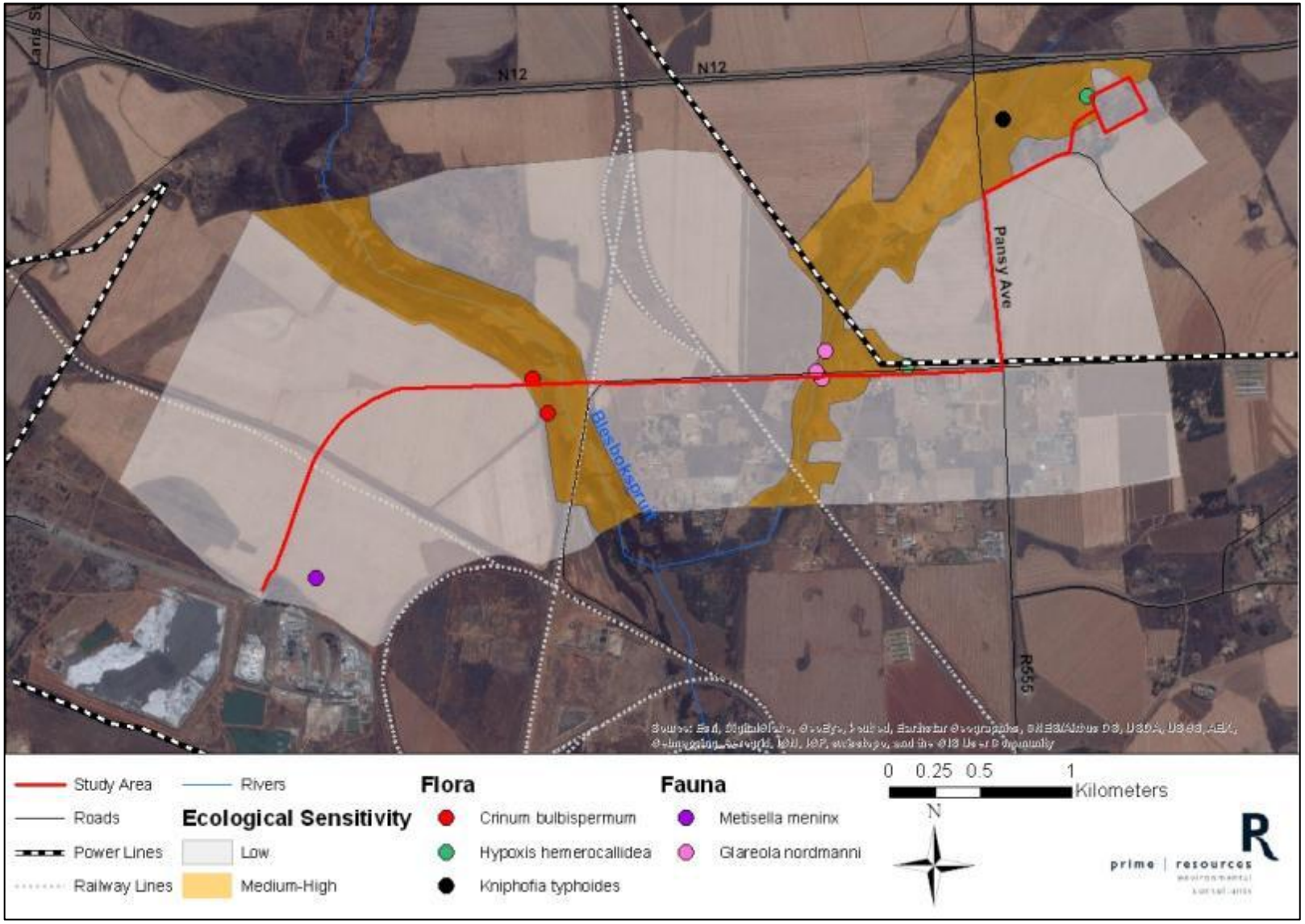


Figure 33: Ecological sensitivity of the project area

x) Traffic

A baseline traffic study was carried out by Siyazi in April 2015 (attached as Appendix 15). The road network associated with the project area includes the N12, Pansy Avenue, Holfontein Road, Carnation Road and an unnamed unpaved road (refer to Figure 34). The proposed project is located south of the N12 and east of Pansy Avenue. Pansy Avenue, Carnation Road and the unnamed unpaved road will serve as the haul roads between ME operations and the Holfontein Project.

The sections of the roads associated with the Holfontein Project can be described as follows:

Holfontein Road

- Local road providing access to surrounding farms and Holfontein shaft from Pansy Avenue;
- Road authority is Gauteng Department of Roads and Transport;
- Class number is R5;
- 30 m road reserve;
- One lane per direction;
- 3.5 m wide lanes;
- Asphalt surface;
- Speed limit not stated but 60km/h is recommended.

Pansy Avenue

- Minor arterial road providing access to the N12;
- Road authority is Gauteng Department of Roads and Transport;
- Class number is R3;
- 40 m road reserve;
- One lane per direction;
- 3.5 m wide lanes;
- Asphalt surface;
- Speed limit is 60km/h.

Carnation Road

- Local road providing access to farms and Welgedacht SH's;
- Road authority is Gauteng Department of Roads and Transport;
- Class number is R5;
- 30 m road reserve;
- One lane per direction;
- 3.2 m wide lanes;
- Asphalt surface;
- Speed limit is 60km/h;
- Eskom Power line running alongside road.

Unnamed unpaved road off Carnation Road

- Local road providing access to farms;
- Class number is R5;
- Single unpaved road;

- 5.0 m wide lane;
- Gravel;
- Speed limit not stated but 40km/h is recommended;
- Road crosses over the Blesbokspruit.

Traffic Counts

Intersection assessments were undertaken at two intersections along Pansy Avenue [(at Holfontein Road (Point A) and Carnation Road (Point B)] (Figure 34 below). These intersections are currently performing at acceptable levels of service.

The following results were obtained from the traffic count conducted on 27th February 2015:

Table 10: Peak Hour Traffic volumes at the intersections of Pansy Avenue with Holfontein Road and Pansy Avenue with Carnation Road

	POINT A- HOLFONTEIN ROAD INTERSECTION	POINT B- CARNATION ROAD INTERSECTION
AM PEAK (06:45 – 07:45)		
Number of vehicles	917	941
PM PEAK (15:15 – 16:15)		
Number of vehicles	764	760

Figure 34: Roads and intersections associated with the project area

xi) Visual Aesthetics

The following information was obtained from the visual study conducted by Prime Resources in April 2015 (attached as Appendix 16).

Landscape Characterisation

Two site visits were conducted at different times of the year, in September 2014 and March 2015. Crop height and landscape colour differed between the different times of year. Ploughing was taking place on the surrounding farms in September and the natural vegetation was dormant and brown giving the landscape a brown appearance. Crops were fully grown in March and the natural vegetation was active and green giving the landscape a green appearance. The Holfontein Stream and associated wetland are within sighting distance from the proposed site and when in flow they are indirectly visible by greener vegetation along the banks.

Landscape Quality

From the landscape quality assessment it was determined that the landscape quality of the study area (wider area in general) was Moderate and proposed site (site proposed for surface infrastructure, as it is currently, prior to any new development) was Low. The proposed site, prior to development, had a lower landscape quality score compared with that of the study area. Therefore, it was determined that it detracts from the overall scenic quality of the study area. This can be attributed to the fact that the proposed site has been disturbed by historic mining activities.

Sense of Place

Sense of place can be described as a viewer's sense of belonging and the extent to which a person can recognize or recall a place as being distinct from other places. In terms of land use the character of the landscape can be defined as mostly agricultural. The noise character at the Holfontein Project site is typical of a rural area dominated by natural noise primarily from birds, insects and domestic animals, with some noise from domestic activities in the adjacent informal residences as well as continuous background noise from vehicles on the N12 highway. The proposed site is not considered significant in terms of cultural heritage. The proposed site does not have distinct features that would allow for a wide spectrum of users or viewers to recognise it, indicating that it does not have a strong sense of place. The residents of the adjacent residences however have a firm sense of belonging and community and perceive the community as being peaceful.

Viewshed Analysis

Visibility was determined by means of a viewshed analysis for the mine components with the greatest potential visibility (shaft headgear and ventilation shaft). From the analyses it was determined that due to the undulating topography, visibility will be irregular. Field verification also confirmed a degree of visual absorption capacity in terms of vegetation screening due to the tall trees located at the proposed site as well as crops in the summer months.

The analysis revealed that based on the screening provided by topography alone, the proposed headgear has the potential to be visible from approximately 60 % of the area of potential impact (10 km radius) mostly from the west of the proposed site (refer to Figure 35), and the proposed

ventilation shaft has the potential to be visible from approximately 40 % of the area of potential impact (10 km radius) also mostly from the west of the proposed site (refer to Figure 36).

The degree of visibility is influenced by distance and it was determined that the highest visibility of the proposed infrastructure would be in the foreground i.e. within a 1.5 km radius from the proposed site; visibility will decrease in the middle ground, between 1.5 km and 10 km, would have a lesser visibility; and although visibility will be possible from distances further than 10 km from the proposed site, the visual impact at this distance is expected to be low or insignificant because of the relatively small dimension of the mine in the total field of vision.

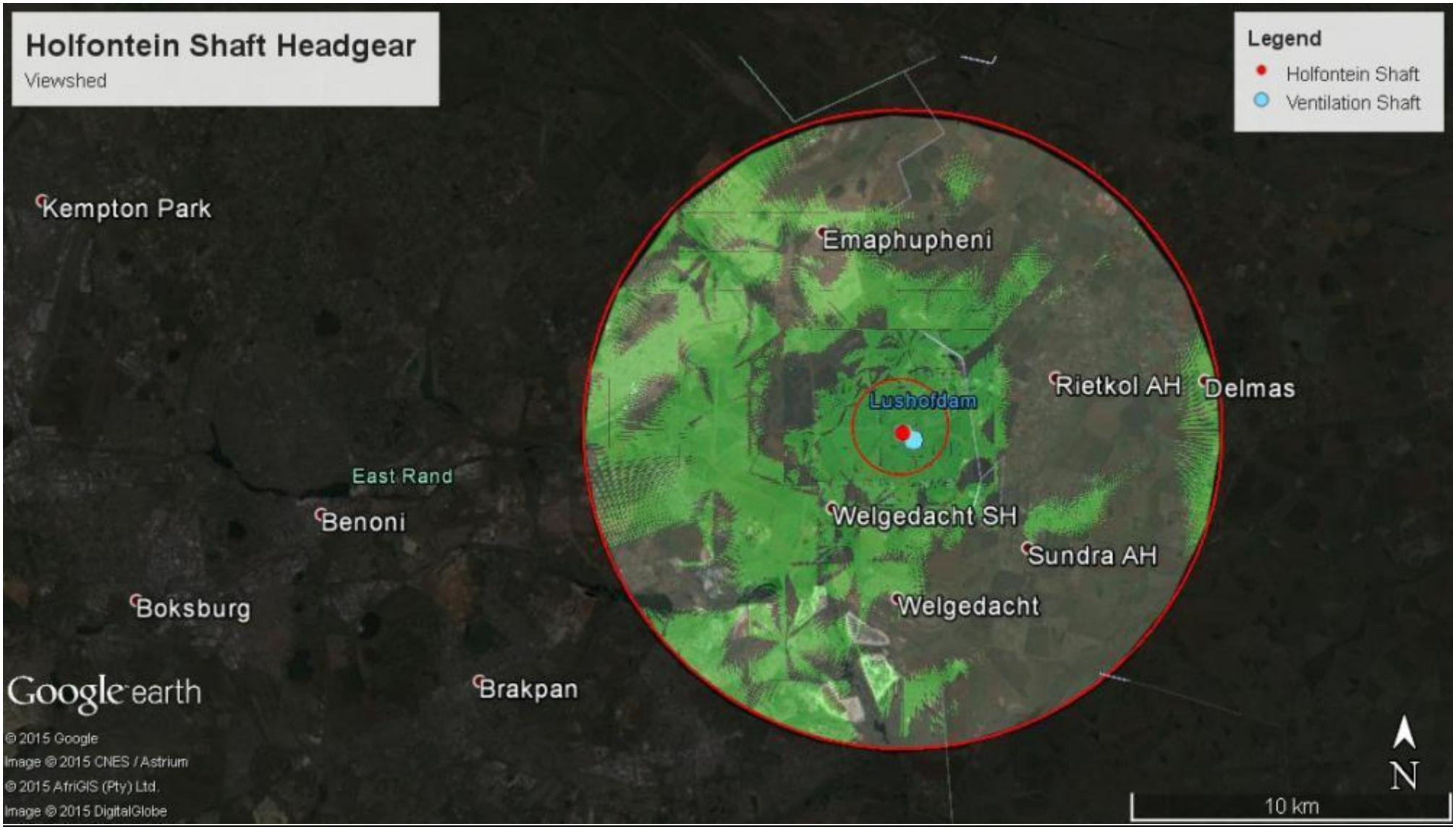


Figure 35: Holfontein shaft viewshed (areas where the shaft is visible are indicated in green)

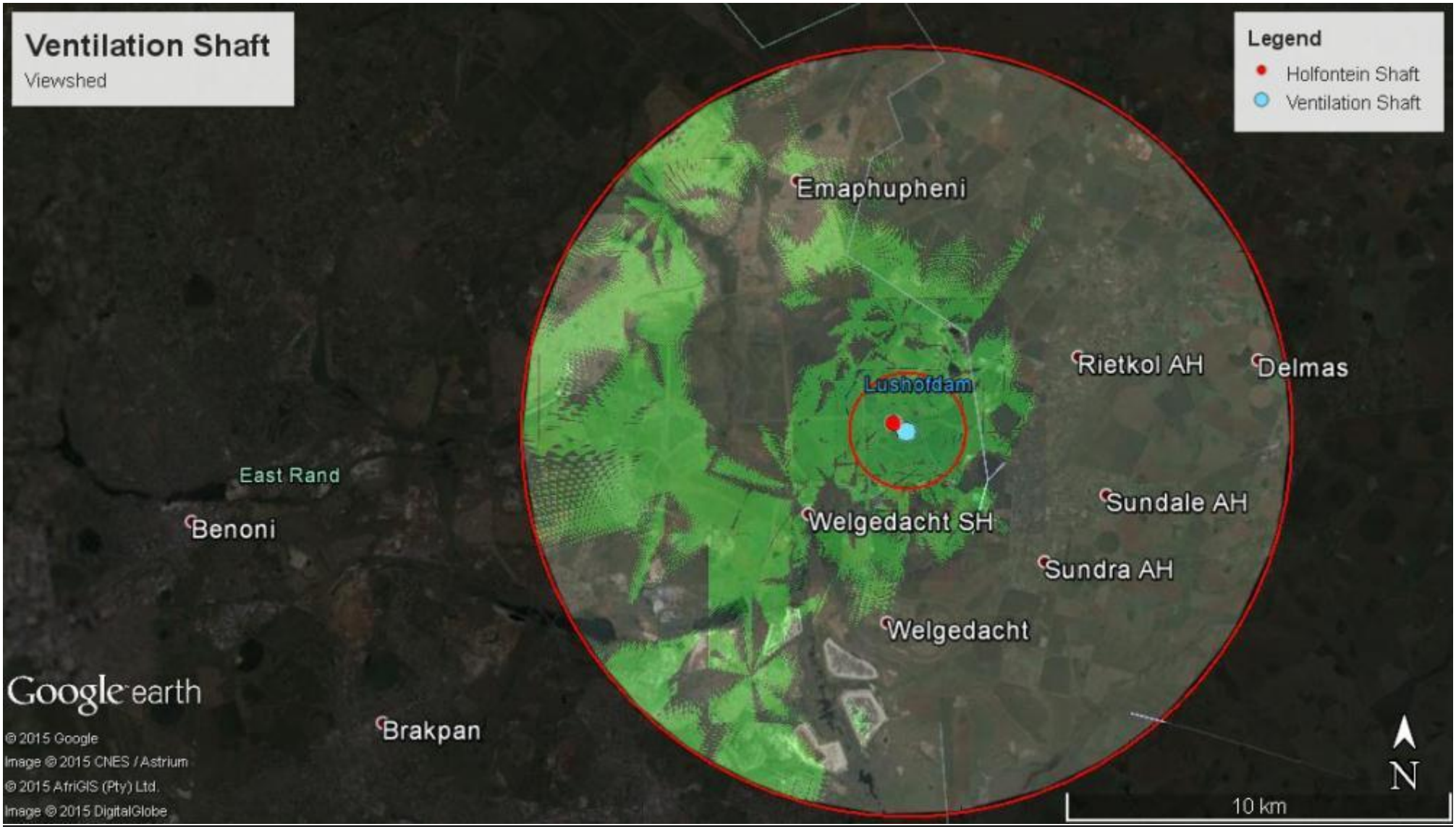


Figure 36: Ventilation shaft viewshed (areas where the shaft is visible are indicated in green)

Visual Absorption Capacity

The Visual Absorption Capacity (VAC) is the capacity of the receiving environment to absorb the potential visual impact of the proposed development while maintaining existing characteristics. The VAC is primarily a function of the vegetation, and will be high if the vegetation is tall, dense and continuous. The topography, being gently undulating, does not provide significant background in terms of high ground or ridges. The development of mining operations in the area has over time established a degree of visual impact which in itself may be regarded as an absorption factor, as the proposed development is similar in size and substance to the existing developments.

Field verification at specific viewpoints (refer to Figure 37) confirmed a degree of visual absorption capacity in terms of vegetation screening due to the tall trees located at the proposed site as well as crops in the summer months.

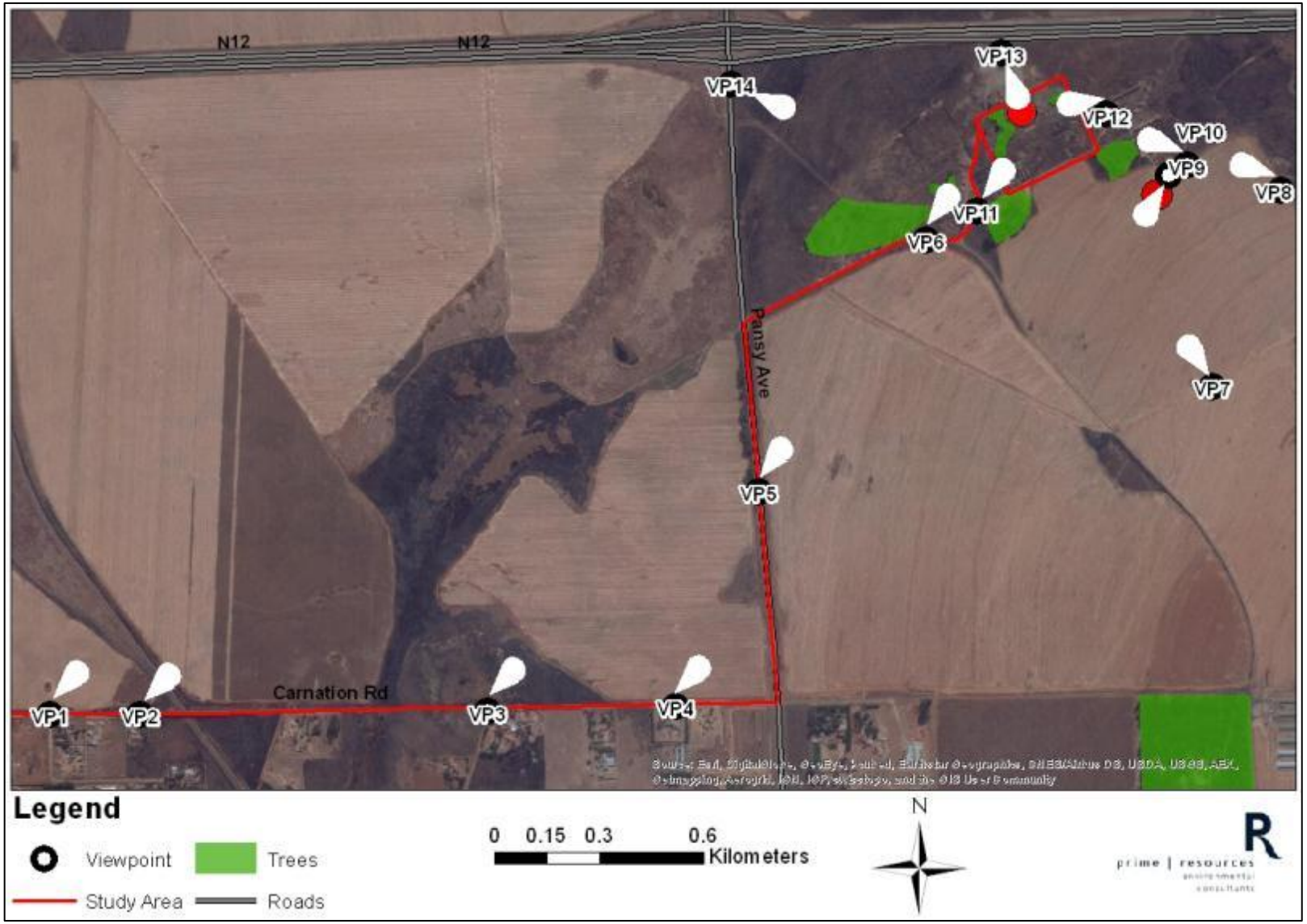


Figure 37: Viewpoints

Sensitive Visual Receptors

Visual receptors were determined using the viewshed analysis and field verification. A sensitivity assessment of the identified visual receptors was then carried out. The residents of the historic mine hostel and mine managers house as well as of the adjacent informal residences are the most sensitive visual receptors and are likely to be the most impacted due to their close proximity to- and their permanent unobstructed view of the proposed development (refer to Figure 38). Occasional viewers will be present on roads around the proposed development with those on the N12 and surrounding farm roads within the foreground (1.5 km of the proposed site) identified as the most sensitive.

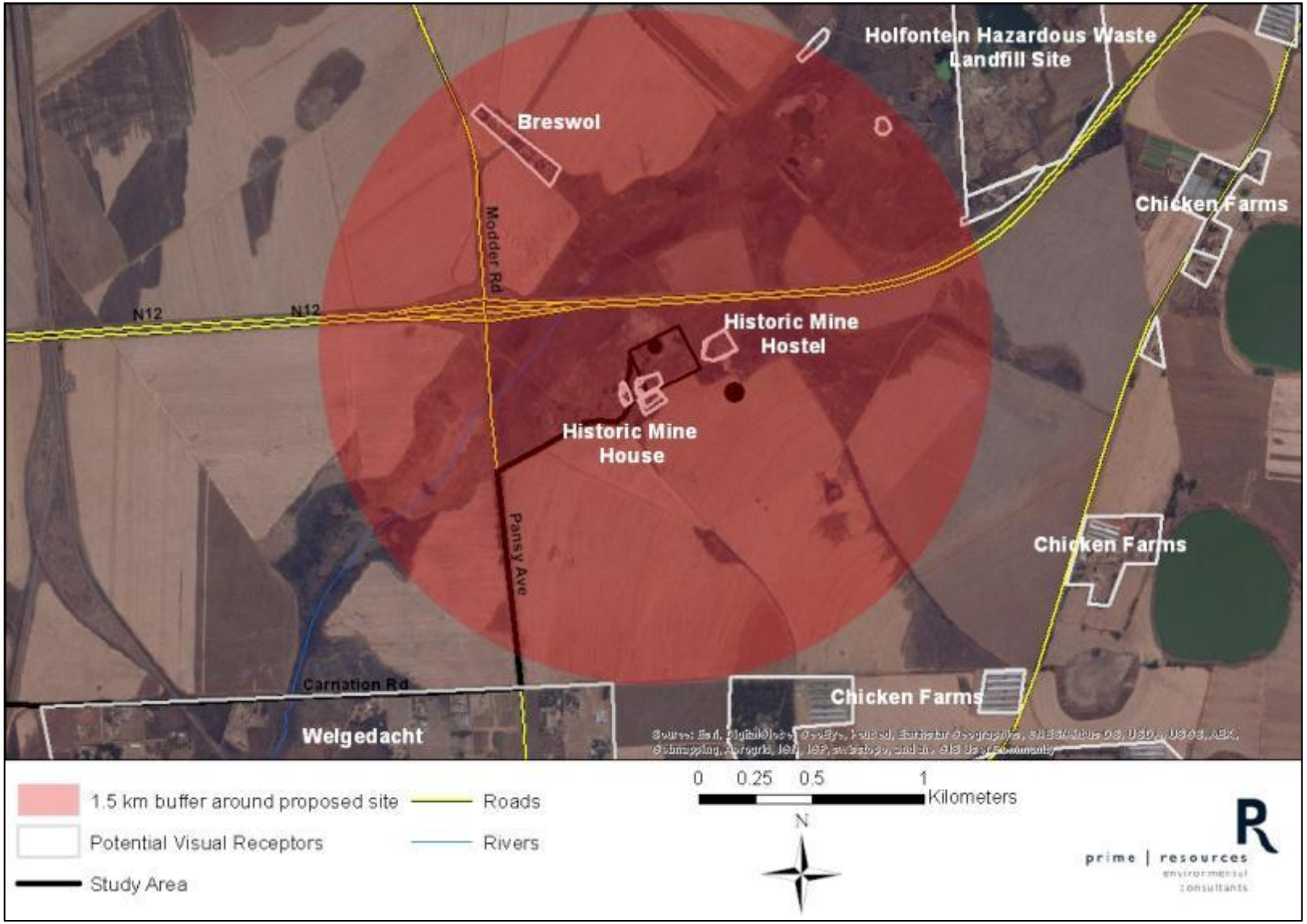


Figure 38: Sensitive visual receptors (red indicates the foreground)

xii) Wetlands

A specialist wetland baseline assessment was conducted by SEF in April 2015 (attached as Appendix 13) from which the following baseline information was obtained. According to the assessment, three hydro-geomorphic units (HGM), comprising three HGM types, were delineated and classified within the project area and within 500 m surrounding the proposed surface infrastructure. The HGM types included a valley bottom floodplain wetland, an unchannelled valley bottom wetland and a hillslope seepage wetland connected to a watercourse.

The Blesbokspruit wetland was artificially transformed from the early 1930s to a permanently inundated status as a result of various discharges of large quantities of water from surrounding underground gold mines, Sappi Enstra Paper Mill and upstream Welgedacht WWTW. Consequently, while the associated section of the Blesbokspruit watercourse was observed to express a non-perennial nature, the system was still suspected to be supported by a number of upstream industrial discharges as well as increasing urban runoff from developing areas in southern Gauteng.

NFEPA Wetlands

Freshwater Ecosystem Priority Area (FEPA) wetlands identified within the project area and vicinity include the Blesbokspruit wetland as well as several tributaries of the Blesbokspruit wetland (refer to Figure 39).

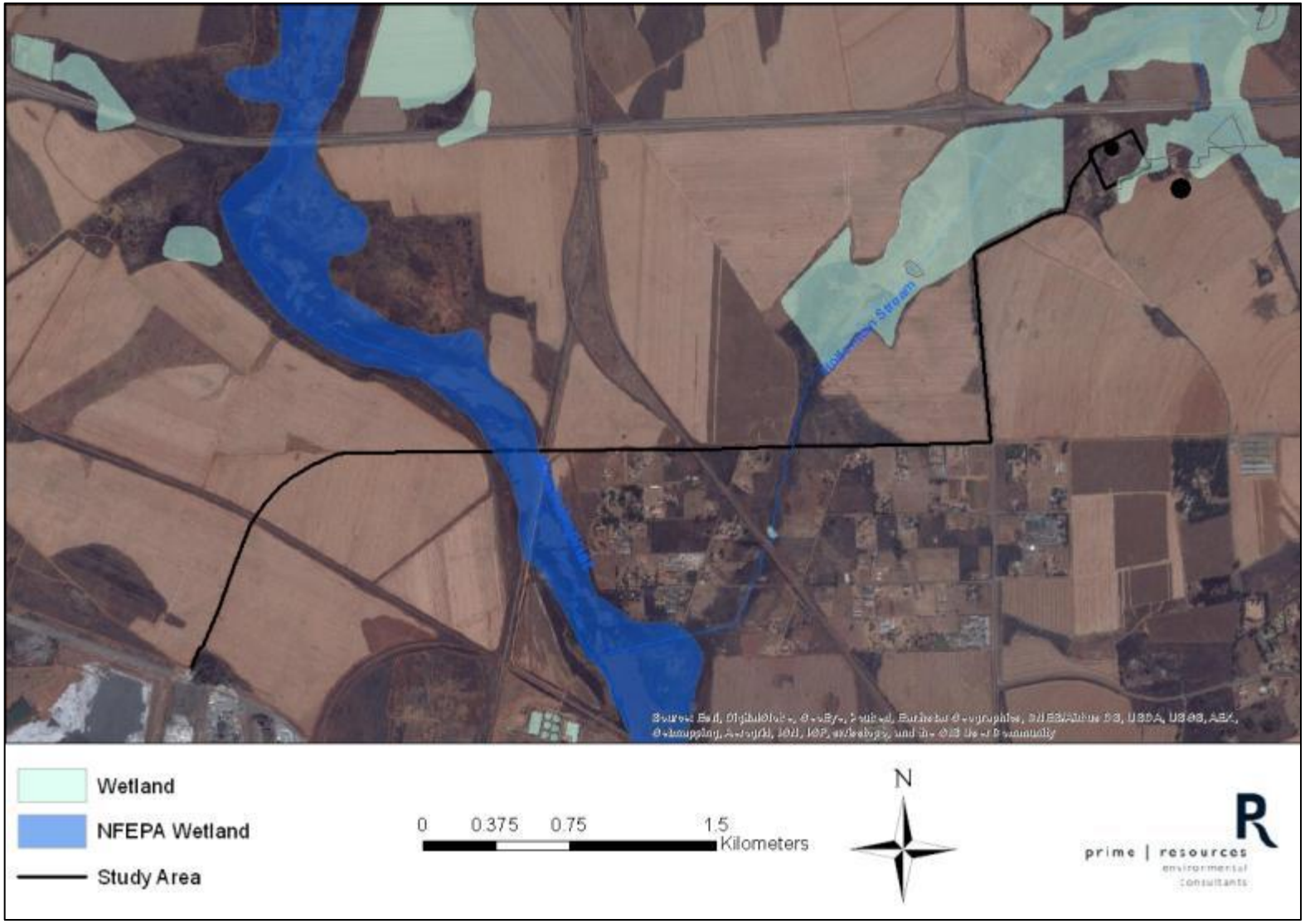


Figure 39: NFEPA map of the project area

Hydric Soils

Hydric soil forms identified within temporary and seasonal wetland zonation supported the Longlands, Pinedene Sepane, Tukulu, Bloemdal, Bainsvlei and Glenrosa soil forms. The Katspruit and Champagne soil forms were identified within the permanent zonation of wetland habitat.

Wetland Vegetation

Permanent wetland areas in the project area contained *Phragmites australis*, *Typha capensis*, *Leersia hexandra* and *Persicaria* sp., with a mixture of facultative and terrestrial species (mostly graminoids and weeds) dominating the seasonal and temporary wetland areas, including species such as *Imperata cylindrica, Agrostis lachnantha, Verbena bonariensis, Eragrostis plana, Helichrysum rugulosum, Andropogeon eucomus, Panicum schinzii, Hemarthria altissima, Crinum bulbispermum (declining) Kyllinga spp., Cyperus marginatus, Pycereus macranthus, P. nitidus, Schoenoplectus brachyceras, Juncus sp., Satyrium sp., Kniphofia typhoides (Near Threatened), Fimbristylis sp.* and *Isolepis setacea.*

Delineated Wetland Areas

Three hydro-geomorphic units (HGM) namely a valley bottom floodplain wetland, an unchannelled valley bottom wetland and a hillslope seepage wetland connected to a watercourse, were delineated and classified within the study area and within 500 m of the proposed surface infrastructure (refer to Figure 40).

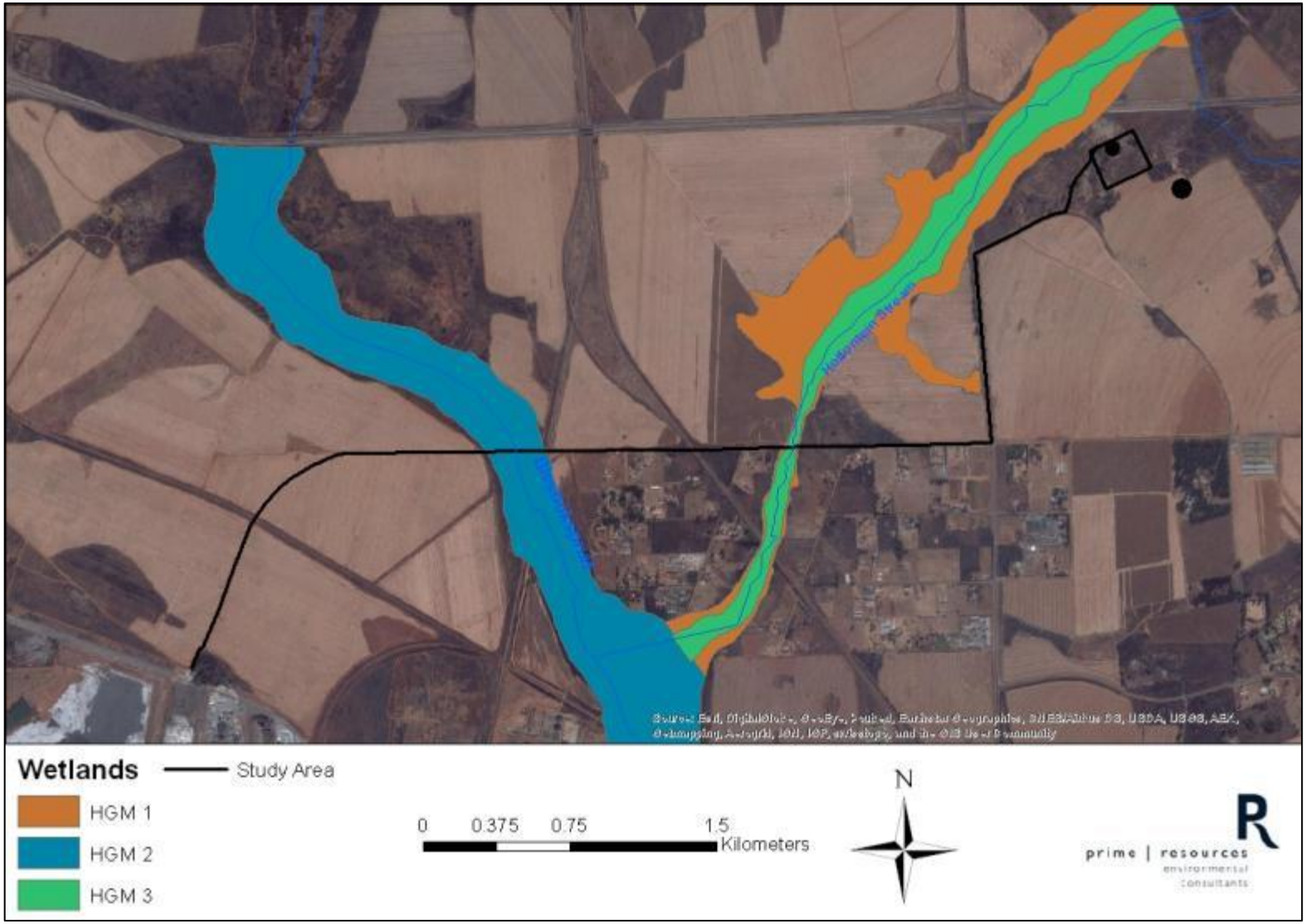


Figure 40: Wetlands delineated

Functional and Present Ecological State

HGM 1- Unchannelled valley bottom wetland

- PES and associated wetland functionality within the project area were reduced as a result of the historic and current anthropogenic land uses;
- PES Category C, representing a moderately modified system;
- Water inputs (derived from its catchment) and water retention and distribution patterns have been altered;
- The largest impact on the hydrology was canalisation within a naturally unchannelled system;
- Highest ecosystem services scores for sediment trapping, phosphate removal, nitrate removal, erosion control and maintenance of biodiversity (refer to Figure 41 below).

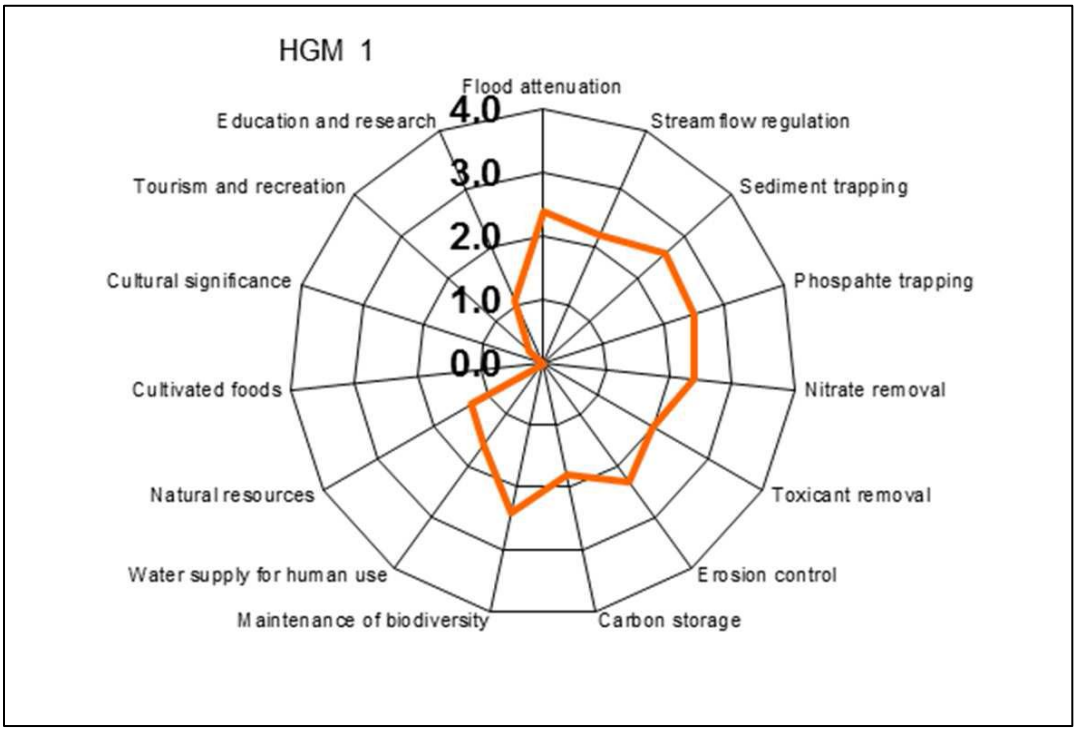


Figure 41: Spiderweb diagram depicting ecosystem services for HGM 1

HGM 2- Hillslope seepage connected to a watercourse

- PES and associated wetland functionality within the project area were reduced as a result of the historic and current anthropogenic land uses;
- PES Category C, representing a moderately modified system;
- Water inputs (derived from its catchment) and water retention and distribution patterns have been moderately altered;
- Highest ecosystem services scores for stream flow regulation, sediment trapping, toxicant and nitrate removal, erosion control and biodiversity (refer to Figure 42 below).

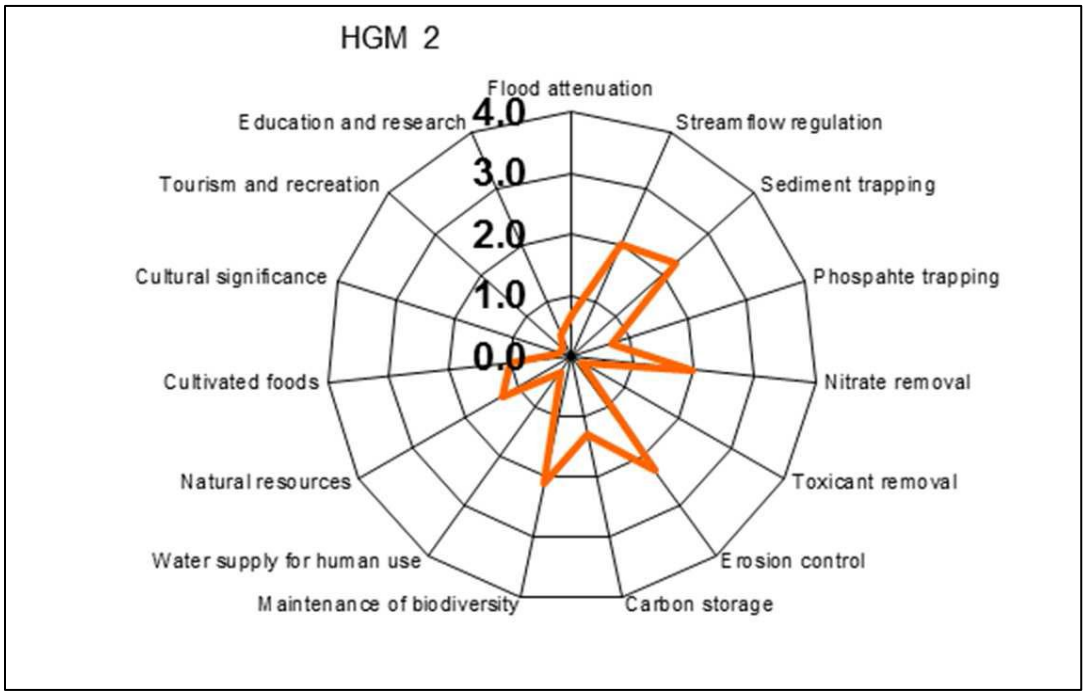


Figure 42: Spiderweb diagram depicting ecosystem services for HGM 2

HGM 3- Valley bottom floodplain wetland

- Can provide water to several downstream users throughout the year, particularly during the dry winter months;
- Regulates flow and controls erosion and flooding in the surrounding areas by absorbing excess of running and discharged waters from various sources as a result of the extensive reedbeds that have developed;
- PES Category F, representing a critically modified system;
- The largest impact on the hydrology and geomorphology of the system was the construction of several linear impeding features combined with increased water inputs from mines, industry and sewerage works, which have changed the wetland from a narrow meandering nonperennial stream with an associated "wet meadow" wetland, to a permanently inundated floodplain;
- As a result of the large size and regional importance in terms of functionality, HGM 3 received relatively high ecosystem services scores compared to other wetlands in the vicinity (refer to Figure 43).

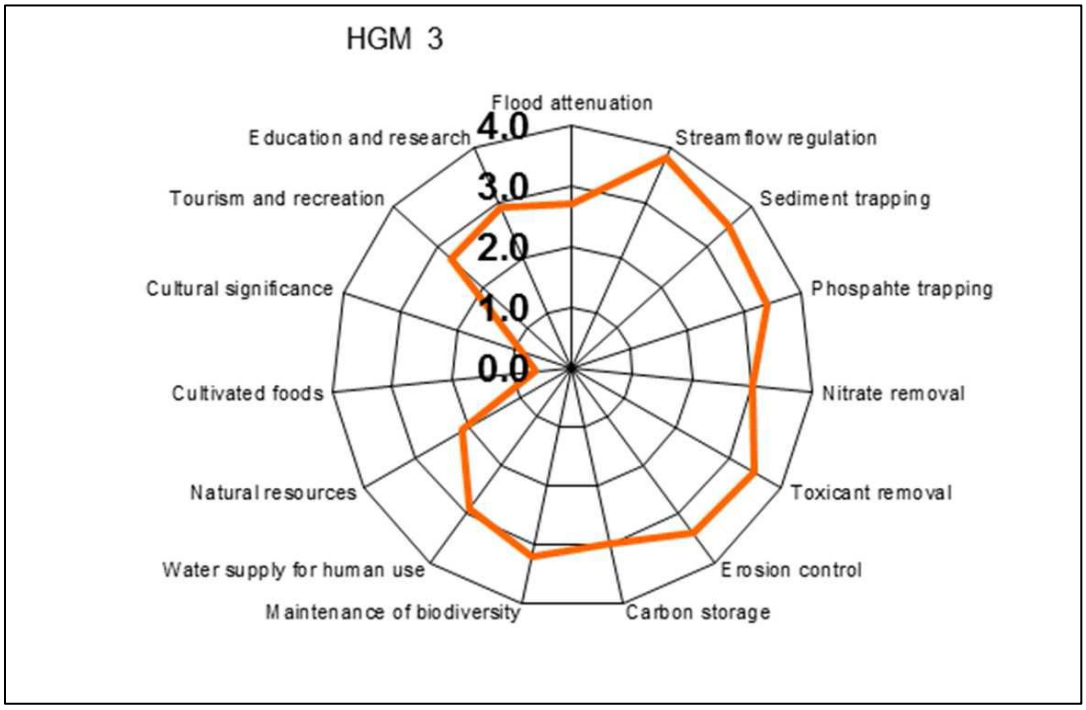


Figure 43: Spiderweb diagram depicting ecosystem services for HGM 3

Ecological Importance and Sensitivity Assessment

Wetlands within the project area serve to improve habitat within and potentially downstream of the project area through the provision of various ecosystem services, including sediment trapping, nitrate removal, toxicant removal, erosion control, carbon storage, maintenance of biodiversity and flood attenuation. PES scores were determined for wetlands within the project area using Wet-Health Level 2 assessment which indicated that two of the wetlands were in a moderately modified state and one wetland, the Blesbokspruit wetland, was critically modified. The Ecological Importance and Sensitivity Assessment was undertaken to rank water resources in terms of provision of goods and services or valuable ecosystem functions which benefit people, biodiversity support and ecological value, and reliance of subsistence users.

Ecological Importance and Sensitivity assigned to the HGM units ranged from low to high depending on their specific attributes within the project area. The **moderate** Ecological Importance and Sensitivity assigned to **HGM 1** unit can be attributed to potential and confirmed biodiversity features such as *Kniphofia typhoides* (Near Threatened) and *Crinum bulbispermum* (declining) associated with the unchannelled valley bottom. HGM 1 also plays a supporting ecological and hydrological role to HGM 3 (Ramsar site). **HGM 2** was considered to be of **low** ecological functional and human benefit importance although from a hydrological importance it does support HGM 2. It also provides extended grazing opportunities compared to terrestrial grasslands as a result of the higher moisture content of graminoids that is available later in the season. The most important wetland in terms of Ecological Importance and Sensitivity (moderate - high score) was the Blesbokspruit Floodplain as a result of the Ramsar status directly downstream of **HGM 3** in combination with several confirmed biodiversity features and hydrological functional importance associated with the wetland in the project area.

b) Description of the current land uses

Land use data for the Holfontein Project area was obtained from the Ekurhuleni GIS Data 2007 Land Use Map. The land use associated with the proposed surface infrastructure is classified as residential, with the historical mine buildings being inhabited. The land use associated with the proposed ventilation shaft is classified as low value cultivation/ agriculture (soya bean) (refer to the photographs and Figure 44 in Section 11)b)ii) below). The haul road route currently exists as asphalt and gravel roads – no new roads will be constructed.

The initial and follow up site visits (2 September 2014 and 4 March 2015) determined the current land uses (refer to the photographs below).

- Within the proposed surface infrastructure area there are concrete foundations and various remnants associated with the existing (historical) Holfontein mine shaft (Photo 1).
- Along the boundary of the proposed surface infrastructure area, the historical mine buildings are inhabited, and have associated subsistence farming activities (Photo 2 and 3).
- The ventilation shaft location is within an agricultural area that was supporting soya bean at the time of the site visits

Photo 1: Remnants of historical infrastructure at the Holfontein Mine Shaft

Photo 2: Inhabited historical mine buildings in the vicinity of the proposed project area

to 3: Inhabited historical mine buildings in the vicinity of the proposed project area

i) Description of specific environmental features and infrastructure on the site

The infrastructure within the proposed site is limited to historical mining remains (Photos 1, 4 and 5). There is also indigenous vegetation present within the project site (Photo 6) and cultivated land (soy bean) in the area where the ventilation shaft is to be located (Photo 7).

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photo 4: Historic mining remains – concrete foundations of the Holfontein shaft</td><td>Photo 5: Historic mining remains – concrete foundations of the Holfontein shaft</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Photo 6: Natural vegetation within the project area</td><td>Photo 7: Soy bean farming</td></tr>
</table>

ii) Environmental and current land use map (Show all environmental, and current land use features)

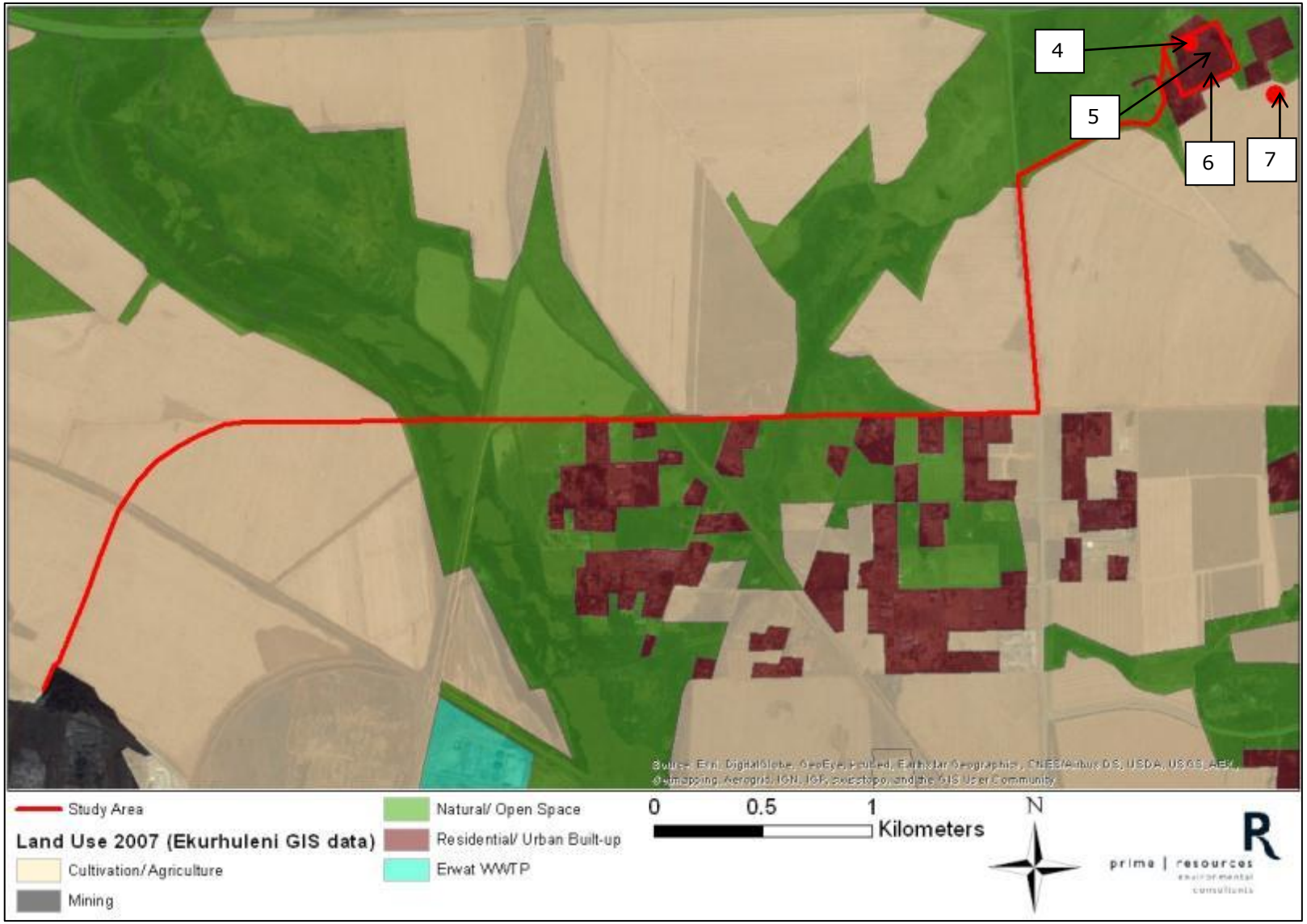


Figure 44: Ekurhuleni 2007 Land Use Map for the project area (where the photographs above were taken is illustrated by the annotations)

c) Impacts identified **(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts)**

The preferred initial site layout (refer to Figure 2) will be conveyed to relevant State Departments and IAPs during the Scoping Phase stakeholder engagement process.

The potential positive and negative impacts, including cumulative impacts, of the Holfontein Project will be assessed during the EIA phase. From an initial high level assessment, the impacts (prior to mitigation) and associated significance, probability and duration are identified in Table 11 below.

Table 11: Potential impacts of the preferred initial layout

ACTIVITY	POTENTIAL IMPACT	MAGNITUDE	SCALE	DURATION	PROBABILITY	SIGNIFICANCE	
Construction (re-furbishing) and operation of Holfontein shaft	Nuisance noise generated by hoisting and ore loading operations at the shaft	6	2	3	4	44	Medium (-)
	Dust emissions resulting from hoisting and ore loading operations at the shaft	8	2	3	3	39	Medium (-)
	Visual intrusion (including lighting at night) of the shaft and ventilation shaft	6	2	3	4	44	Medium (-)
	Underground mining negatively impacting the quality of groundwater coming into contact with exposed ore	8	2	5	4	60	High (-)
	Dewatering of the underground mining areas impacting on water users (boreholes into the dolomitic aquifer)	8	2	3	3	39	Medium (-)
	Possible influx of job seekers into the area resulting in pressure on existing infrastructure and an increase in crime and social ills	8	2	5	4	60	High (-)
	Provide sustained employment for existing employees as well as the local economic development initiatives and contribution to the GDP	8	2	3	5	65	High (+)
Construction and operation of additional infrastructure associated with the shaft	Contaminated runoff entering watercourses / wetlands or seeping into groundwater	8	2	4	3	42	Medium (-)
	Loss of conservation important plant and animal species as a result of clearing of ground	8	1	5	2	28	Low (-)
Ventilation shaft	Nuisance noise generated by fan	8	2	3	5	65	High (-)
	Air quality impact from ventilation shaft emissions	4	1	3	3	24	Medium (-)
	Visual intrusion	6	2	3	4	44	Medium (-)
Power lines	Injury to birds flying toward the downstream RAMSAR site	8	2	3	3	39	Medium (-)
Haul route	Impact on air quality by dust	8	2	3	4	52	Medium (-)

	generation from vehicle entrainment on unpaved portions of the haul route						
	Vehicle tailpipe emissions from haul trucks	4	1	3	3	24	Low (-)
	Loss of plant species of conservation concern if unpaved portions of the haul road are graded and widened without the relocation of species	6	1	5	2	24	Low (-)
	Impact on cemetery at ME operations if unpaved portions of the haul road are graded and widened in the direction of the cemetery	8	1	5	2	28	Low (-)
	Indirect impact of mining on historic mine house which may be of cultural heritage concern	6	1	5	1	13	Low (-)
	Positive impact on the integrity of the floodplain wetland associated with the Blesbokspruit from the upgrading of the low level crossing	6	2	5	5	65	High (+)
	Nuisance noise generated by haul trucks passing Welgedacht on Carnation Road	6	1	3	4	40	Medium (-)
	Traffic safety implications due to haul trucks turning onto and across Pansy Road and travelling along Carnation Road	6	1	3	4	40	Medium (-)
	Traffic safety implications for inhabitants living within the historical mine buildings near the shaft	8	1	3	3	36	Medium (-)
	Degradation of the road surfaces due to haul trucks	4	1	3	4	32	Medium (-)

i) Methodology used in determining the significance of environmental impacts

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision)

The Prime Resources (Pty) Ltd Impact Assessment Methodology and rationale was used to assess the significance of the potential impacts of the preferred initial layout and technological alternatives on the surrounding biophysical and socio-economic environment.

The methodology encompasses an assessment of the nature, extent, duration, probability and significance of the identified potential environmental, social and cultural impacts of the mining operation, including the cumulative environmental impacts. The significance of both positive and negative potential impacts will be determined through the evaluation of impact consequence and likelihood of occurrence.

The following risk assessment model has been used for determination of the significance of impacts.

SIGNIFICANCE = (MAGNITUDE + DURATION + SCALE) X PROBABILITY

The maximum potential value for significance of an impact is 100 points. Environmental impacts can therefore be rated as high, medium or low significance on the following basis:

- High environmental significance 60 – 100 points
- Medium environmental significance 30 – 59 points
- Low environmental significance 0 – 29 points

MAGNITUDE (M)	DURATION (D)
10 – Very high (or unknown)	5 – Permanent
8 – High	4 – Long-term (ceases at the end of operation)
6 – Moderate	3 – Medium-term (5-15 years)
4 – Low	2 – Short-term (0-5 years)
2 – Minor	1 – Immediate
SCALE (S)	**PROBABILITY (P)**
5 – International	5 – Definite (or unknown)
4 – National	4 – High probability
3 – Regional	3 – Medium probability
2 – Local	2 – Low probability
1 – Site	1 – Improbable
0 – None	0 – None

ii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected (Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

The preferred initial layout (refer to Figure 2) will be conveyed to relevant State Departments and IAPs during the scoping phase stakeholder engagement process and further alternatives will be investigated prior to finalising the layout if required based on issues and concerns raised during the stakeholder engagement process.

The advantages of the preferred initial layout are that it is likely to have the least impact on the surrounding environment as it remains within areas which have been disturbed by historic mining activities. These areas have a low ecological sensitivity. Areas transformed by agriculture (ventilation shaft location) have a low agricultural potential. The haul route has also been restricted to existing roads to avoid further disturbance of sensitive areas. There are also positive residual impacts in the form of upgrading the existing low level crossing of the Blesbokspruit which will allow for the floodplain wetland to attain a more natural flow path.

The disadvantages of the preferred initial layout include that the proposed activities are within close proximity (within 200 m) of the Khomponi community, and the haul route passes by residential and commercial buildings within the Welgedacht smallholdings, which is likely to result in negative social impacts.

The alternative locations have been suggested in the site screening report (Appendix 4). Site 1 is located north of the N12 highway. While it is further than 1500 m away from residential and commercial areas (therefore having fewer direct impacts on communities), it has a potentially higher impact on the environment as it is located within located within a Critical Biodiversity Area and is located close to a high value cultural heritage site. Further disadvantages are that it requires the crossing of a major highway, which is not favoured by the relevant authorities, and that there is no existing infrastructure on the site, which will therefore require a greater footprint and cost to develop.

Site 2 is located within higher value agricultural land and would require the development / transformation of this land for mining purposes. It would also have a large footprint and greater development cost as no infrastructure exists on the site. It is however possibly the site furthest from residential development and therefore would have the lowest impact on communities.

iii) The possible mitigation measures that could be applied and the level of risk (With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered)

A detailed site screening assessment was conducted and the report is attached as Appendix 4. Stakeholder engagement did not form part of the initial site screening process.

Refer to Figure 2 above for the preferred initial layout plan which will be provided to relevant State Departments and IAPs during the scoping phase stakeholder engagement process. An issues register will be compiled during the Scoping Phase engagement process and alternatives will be investigated to accommodate any issues and concerns raised. Thereafter the initial preferred layout will be amended.

Typical mitigation measures for the impacts, identified thus far, of the preferred initial layout are detailed in Section 12)g) below. Potential impacts of the final site layout will be assessed in detail during the EIA phase.

d) The outcome of the site selection Matrix. Final Site Layout Plan **(Provide a final site layout plan as informed by the process of consultation with interested and affected parties)**

The preferred initial layout plan (refer to Figure 2) located at the site identified as the preferred site from the site selection matrix (refer to Appendix 4) will be provided to relevant State Departments and IAPs during the scoping phase stakeholder engagement process for comment. If issues and concerns are raised which require the revision of the layout to the final layout, this will be done prior to the submission of the Scoping Report to the Competent Authority for consideration. If there is no need for the layout to be revised following stakeholder engagement the preferred initial layout will be considered as the final layout to be further assessed during the EIA phase.

i) Motivation where no alternative sites were considered

Not applicable. Site alternatives were considered (refer to Section 9)) and further alternatives will be assessed if required based on the outcome of the scoping phase stakeholder engagement process.

ii) Statement motivating the preferred site **(Provide a statement motivation the final site layout that is proposed)**

The preferred site location was selected as it is the most financially feasible and has limited environmental impacts. An existing shaft is to be refurbished and utilised, rather than a new shaft being excavated. The existing shaft is located within areas of low ecological sensitivity and low agricultural potential, and impacts should be contained to the small footprint area. The shaft is located within areas previously disturbed by mining activities. The haul route has been restricted to existing roads to avoid further disturbance of sensitive areas.

12) PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

a) Description of alternatives to be considered including the option of not going ahead with the activity

Layout and technological alternatives were considered for the project. Refer to Section 9). The final layout will be assessed during the EIA phase, and further technological and operational alternatives recommended based on the outcome of the EIA.

The option of not going ahead with the Holfontein Project will also be considered.

b) Description of the aspects to be assessed as part of the environmental impact assessment process **(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, Loading, hauling and transport, and mining activities such as Excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**

The project activities to be assessed include:

Refurbishment of the existing Holfontein shaft; construction of additional supporting infrastructure at the Holfontein shaft; construction of a ventilation shaft, second emergency outlet and associated winder and substation; and the construction of a power line and haul route between the Holfontein shaft and the ME operations.

The potential impacts on the following aspects will be assessed as part of the EIA process:

- Air Quality;
- Archaeology;
- Aquatic Ecology;
- Hydrogeology;
- Hydrology;
- Noise;
- Soil;
- Social;
- Terrestrial Ecology;
- Traffic;
- Visual Aesthetics; and
- Wetlands.

The findings of the EIA process will provide a detailed overview of the potential impacts (including direct, indirect, cumulative and latent impacts) of the proposed project on the biophysical and social environments.

c) Description of aspects to be assessed by specialists

The following specialists have been commissioned to assess the impacts of the Holfontein Project:

Air Quality	Prime Resources
Archaeology	Anton Pelser Archaeological Consulting
Aquatic Ecology	Strategic Environmental Focus
Hydrogeology	Groundwater Square
Hydrology	African Environmental Development

Noise	JH Acoustic Consulting
Soil	Prime Resources
Social	Prime Resources
Terrestrial Ecology	Strategic Environmental Focus
Traffic	Siyazi Gauteng
Visual Aesthetics	Prime Resources
Wetlands	Strategic Environmental Focus

A brief description of each specialist scope is provided below.

Air quality

- Relevant legislation and associated requirements
- Existing land use and associated sources of emissions
- Potential sensitive receptors,
- Environmental constraints relative to air quality
- Ambient air quality will be characterised;
- Prevailing local weather conditions, and the influence on the dispersion and dilution potential of pollutants released into the atmosphere;
- An emissions inventory will be compiled;
- Potential emissions will be modelled to determine the potential ambient air quality impacts; and
- Recommendations will be provided regarding mitigation and management of the identified potential impacts.

Archaeology

- Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites)
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
- Determine the possible impact of the project on these cultural resources;
- Recommendations of suitable mitigation measures to minimize possible negative impacts.

Aquatic ecology

- Undertake a summer survey to characterise the aquatic ecology of the Blesbokspruit and the Holfontein Stream in close proximity to the Holfontein Project area;
- Identify and assess the potential impacts of the proposed infrastructure design, development, implementation and operation on the aquatic ecology within the area;
- Identify any cumulative impacts; and
- Provide practical and implementable mitigation measures (including detailed monitoring measures) by which to manage the impacts for all phases of the project.

Groundwater

- Characterise the baseline groundwater environment of the Holfontein Project area;
- Perform a hydrocensus, within a 2 km radius of the Holfontein shaft;
- Perform a limited magnetic survey to locate shallow dolerite dykes;
- Provide a geochemical statement of anticipated water qualities of identified impacts;
- Provide input into the mine water balance in terms of groundwater management;
- Identify the potential impacts of the proposed related to contamination (quality) and dewatering (quantity) of groundwater (including cumulative impacts); and
- Provide practical and implementable mitigation measures; and opportunities and constraints in the project will be indicated.

Surface water

- Describe the catchment, in particular including a general description of the Blesbokspruit and its tributary, and the impacts from upstream mining/landfill activities on the water quality of this system;
- Illustrate surface water flow patterns at and around the proposed shaft; average flow quantities and peak flow quantities, including the modelling of the volume of rainwater falling on average on the mine site and will also model the peak rainfall, produced by a storm with a 50-year return period falling on the mining area;
- Flood lines of the Blesbokspruit and its tributary will be calculated; accurate contour lines will be acquired; surface water quality will assessed by means of analysis of four surface water samples to be taken;
- A surface water hydrocensus will be undertaken;
- The finding of the above will be used to inform the hydrological impact assessment and to determine the sizes of the surface water pollution control infrastructure; and
- A water quality monitoring programme and a stormwater management plan will also be compiled.

Noise

- Conduct a baseline measurement survey to determine the existing noise levels at the boundaries of the Holfontein Project area;
- Research into the expected noise levels to be generated by the proposed processes, or measurements at similar operations to establish the likely noise levels to be generated;
- Predict the operational noise levels and public response at the boundaries and also at any individual potentially exposed properties outside the proposed boundaries of the site;
- Predict the noise impact of the access roads due to changes in traffic on these roads; and
- Recommend mitigation methods should these be necessary or appropriate.

Soil

- Soil samples will be obtained, the soil types within the Holfontein Project area will be mapped and described (in terms of land use capability, permeability, erosivity, etc.);
- The agricultural potential of the site will be described;
- The existing and current baseline soil conditions, including but not limited to specific areas of contamination from hydrocarbons will be determined and described;

- The potential impacts of the proposed mining activities on the soil resources defined in the baseline characterisation will be assessed;
- Erosion management and mitigation measures will be recommended; and
- If required a soil monitoring programme will be compiled.

Social

- Identify the surrounding / affected communities;
- Map surrounding / affected communities within the project area in respect of the proposed mine layout;
- Identify authorities (ward councillors, EMM LED officer) concerns / queries / expectations / requirements related to the project;
- Identify relevant national, provincial and municipal plans, studies, or assessments that relate directly or indirectly to the project and its area of influence;
- Describe the socio-economic baseline environment at a national, provincial, municipal and local level; the discussion of all relevant South African legislation and the implications thereof;
- The identification and assessment of potential direct and indirect socio-economic impacts, including cumulative impacts;
- The identification of any limitations and / or shortcomings associated with this study; and
- Recommendations for avoidance, mitigation or management of identified impacts will be provided.

Terrestrial ecology

- Undertake a summer survey to characterise the terrestrial ecology within the Holfontein Project area;
- Note, describe and map any sensitive ecosystems / habitats / species that could be impacted on by the all phases of the proposed project and related infrastructure;
- Identify and assess the potential impacts of the proposed infrastructure design, development, implementation and operation on the terrestrial ecology within the area, including any cumulative impacts;
- Provide practical and implementable mitigation measures (including detailed monitoring measures) by which to manage the impacts for all phases of the project; and
- Report on applicable legislation including provincial and national legislation that will impact on the project, and any permits which may need to be obtained moving forward.

Traffic

- Conduct 12-hour manual traffic counts at identified intersections;
- Provide input in terms of access to shaft and proposed haul route (basic input in terms of road safety and road conditions from a visual assessment);
- Conduct detail trip generation and distribution calculations for proposed traffic;
- Conduct detail intersection performance evaluations;
- Provide basic geometric design input for intersections under investigation;
- Prepare a traffic impact assessment; and
- Recommend mitigation measures.

Visual aesthetics

- Characterise of the visual landscape of the Holfontein Project area;
- To identify the potential sensitive receptors, including local communities;
- To identify / determine the viewsheds and potential visual impacts (including graphical representation);
- Assess potential visual impacts using quantitative criteria, such as visibility and exposure, and qualitative criteria such as compatibility and effect on landscape integrity; and
- Recommend mitigation measures for identified potential impacts.

Wetlands

- Conduct a site visit during which all wetland areas that may be affected by the project will be delineated, the status of these wetland areas as well as their functionality and ecosystem services they provide will be assessed and described;
- Note, describe and map any sensitive ecosystems / habitats / species that could be impacted on by the all phases of the proposed project and related infrastructure;
- Identify and assess the potential impacts of the proposed infrastructure design, development, implementation and operation on the wetlands;
- Identify any cumulative impacts; and
- Provide practical and implementable mitigation measures (including detailed monitoring measures) by which to manage the impacts for all phases of the project.

d) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

As described in Section 9), the preferred site and alternatives (Sites 1 to 3 in Figure 3) have been assessed in the site screening report (Appendix 4). The final layout, and any further alternatives (as suggested or raised during the scoping and public engagement process), will be assessed during the EIA phase, in terms of the methodology proposed in Section 11)c)i) above.

i) The proposed method of assessing duration significance

The Prime Resources (Pty) Ltd Impact Assessment Methodology and rationale as described in Section 11)c)i) above will be used to assess the significance of the potential impacts of the Holfontein Project on the surrounding biophysical and social environment.

ii) The stages at which the competent authority will be consulted

The Competent Authority (DMR) has been consulted in a pre-application meeting held on 25 March 2015 at the Braamfontein Offices of the DMR. Refer to the register attached as Appendix 6.1.

The Competent Authority (DMR) was formally notified of the project upon submission of the application for Environmental Authorisation, and Section 102 Notification, via the online SAMRAD system on 9 June 2015.

This Scoping Report will be made available to the Competent Authority (DMR) during the 30-day commenting *period* (11 June 2015 to 12 July 2015). The Scoping Report will further be updated with

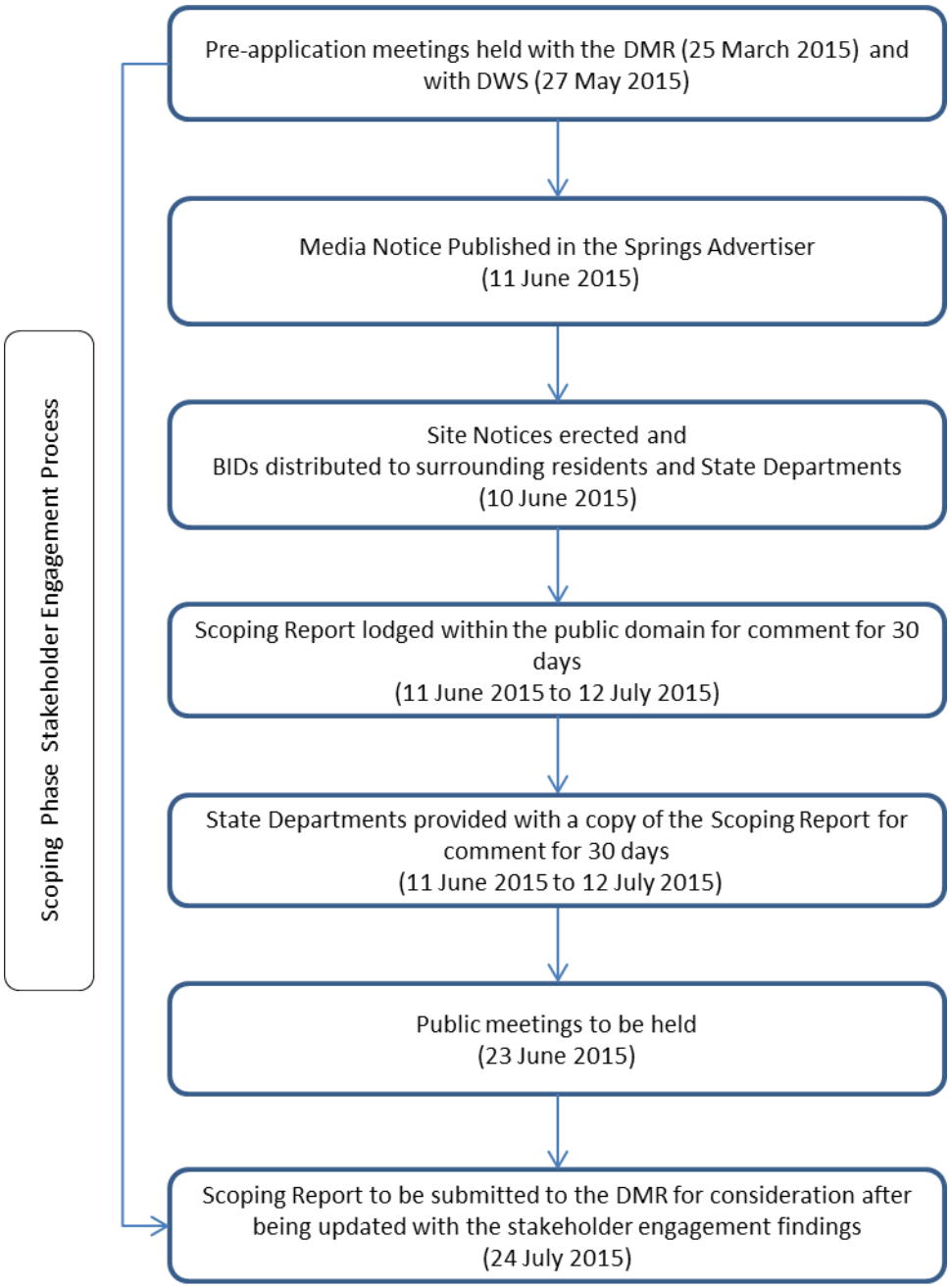
any comments received and will be submitted to the Competent Authority at the end of the commenting period for consideration (24 July 2015).

The EIAR and EMPr will be made available to the Competent Authority (DMR) during the 30-day commenting period (15 September 2015 to 16 October 2015) for the EIA phase. The EIAR and EMPr will further be updated with any comments received and will be submitted to the Competent Authority at the end of the commenting period for consideration (10 November 2015).

e) Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

i) Steps to be taken to notify interested and affected parties **(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h) (ii) herein)**

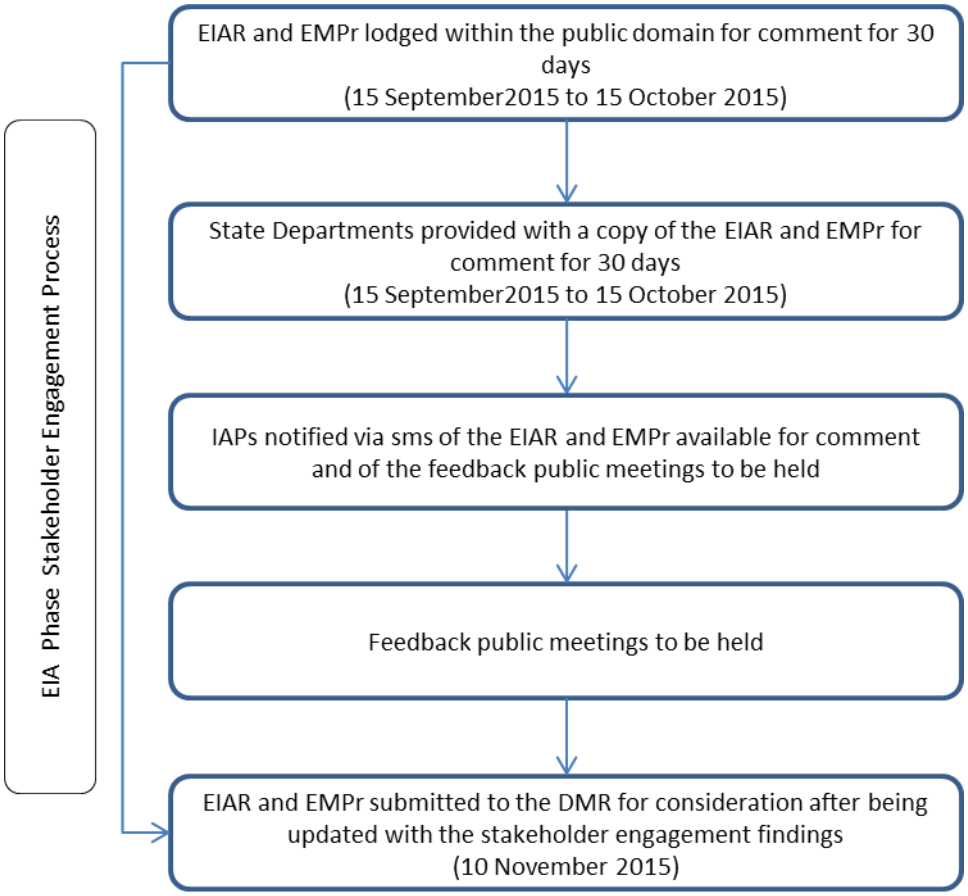
IAPs were notified during the Scoping Phase stakeholder engagement process detailed under Section 10) above. This includes notification via media notice (in Springs Advertiser, dated 11 June 2015), site notices erected at and around the site on 10 June 2015, and via dissemination of BIDs to surrounding residents by hand and to State Departments by email on 10 June 2015. Registered IAPs were notified of the availability of the draft Scoping Report for review (via the media notice published on 11 June 2015, site notices erected -and BIDs disseminated on 10 June 2015), and details of the public meetings were made available to registered IAPs (via sms on 19 June 2015).



IAPs will be further engaged during the EIA phase as per the process described in Section 12)e)ii) below.

ii) Details of the engagement process to be followed **(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and records of such consultation will be required in the EIA at a later stage)**

The EIA phase engagement process is graphically represented in the flow diagram below. All IAPs will be notified of any changes to these dates.



An Environmental Impact Assessment Report (EIAR) and an Environmental Management Programme (EMPr) will be compiled and made available for comment, in the public domain at the same locations as the Scoping Report, as well as made available to State Departments (including the Competent Authority) for a period of 30 days (15 September 2015 to 16 October 2015).

A sms will be sent out to all registered IAPs notifying them of the localities where the EIAR and EMPr can be viewed; of the commenting period; as well as providing the details of the feedback public meetings to be held.

Feedback public meetings will be held, where a presentation will be made to inform the public about the potential impacts; outcomes of the investigations; respond to issues and concerns raised; IAPs will also once again be given the opportunity to raise issues and concerns they may have to the EAP and ask any questions they may have. The IAP database and Comments and Response Report will be updated throughout the feedback stakeholder engagement process and submitted, together with the EIAR and EMPr, to the Competent Authority for consideration after the 30 day commenting period has ended.

iii) Description of the information to be provided to Interested and Affected Parties

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land)

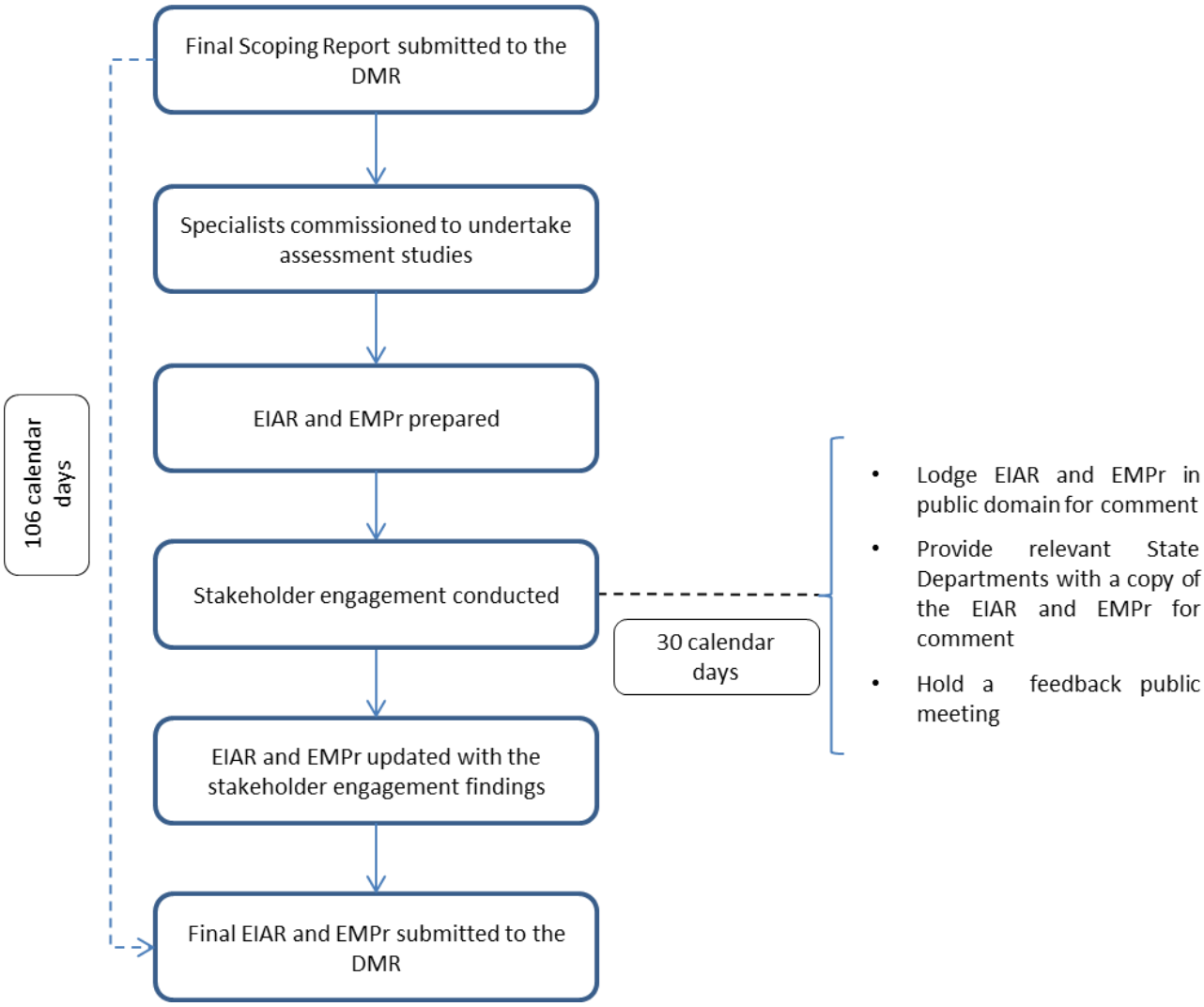
EIA Phase – Feedback Public Participation Process

The information provided will consist of details of the project, including the layout and description of project components, specialist information relating to the existing / baseline information of the site,

potential impacts of the project as identified by the specialists and the EAP, proposed mitigation and management measures to avoid or reduce the impact, the process to be followed for the EIA and commenting by IAPs.

f) Description of the tasks that will be undertaken during the environmental impact assessment process

The tasks to be undertaken during the EIA phase are graphically represented in the following flow diagram:



g) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation...**	**POTENTIAL FOR RESIDUAL RISK**
Construction (re-furbishing) and operation of Holfontein shaft	Nuisance noise generated by hoisting and ore loading operations at the shaft	Noise reduction measures (i.e. use on non-resonating materials, reduction in drop heights etc.) to be implemented if standards are exceeded	None foreseen from activity as the operation of the shaft will cease at closure
	Dust emissions resulting from hoisting and ore loading operations at the shaft	Dust suppression techniques to be implemented	None foreseen from activity as the operation of the shaft will cease at closure.
	Visual intrusion (including lighting at night) of the shaft and ventilation shaft	Camouflaging measures to be employed as well as measures to reduce light spill	None foreseen as infrastructure is to be removed at closure
	Underground mining negatively impacting the quality of groundwater coming into contact with exposed ore	Water treatment options will have to be investigated based on the water quality and expected pollution plume	Possible impact on the quality of groundwater when it comes into contact with exposed ore as groundwater levels begin to return to pre-mining state after closure
	Dewatering of the underground mining areas impacting on water users (boreholes into the dolomitic aquifer)	A hydrocensus has been conducted of surrounding water uses. Measures will have to be investigated if complaints arise	None foreseen as dewatering will cease at closure
	Possible influx of job seekers into the area resulting in pressure on existing infrastructure and an increase in crime and social ills	A collaboration between the Mine and the municipality to be undertaken to prevent an increase in inhabitants within the historical mine buildings and surrounds	If the settling of job seekers in the area is not prevented the impacts on infrastructure, crime and social ills will remain after mine closure
	Provide sustained employment for existing employees as well as the local economic development initiatives and contribution to	Positive impact which does not require mitigation. Measures to enhance positive impacts will be investigated	Positive impacts will no longer occur after the closure.

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)**.	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation...**	**POTENTIAL FOR RESIDUAL RISK**
	the GDP		
Construction and operation of additional infrastructure associated with the shaft	Contaminated runoff entering watercourses / wetlands or seeping into groundwater	Dirty water catchment to have an impermeable floor and to be bunded. All dirty water to be diverted to a pollution control dam and contained on site	None foreseen as all infrastructure will be removed and operations will cease at closure
	Loss of conservation important plant and animal species as a result of clearing of ground	If in the unlikely event species of conservation concern are identified within the proposed surface infrastructure area, permits will be acquired for the removal and relocation of these species	The impact of loss if mitigation is not implemented effectively remains
Ventilation shaft	Nuisance noise generated by fan	Noise reduction measures (such as installing the fan underground) to be implemented if standards are exceeded	None foreseen as the operation of the ventilation shaft will cease at closure
	Air quality impact from ventilation shaft emissions	Air cleaning technologies to be implemented if standards are exceeded	None foreseen as the operation of the ventilation shaft will cease at closure
	Visual intrusion	Camouflaging measures to be employed	None foreseen as ventilation shaft infrastructure is to be removed at closure
Power lines	Injury to birds flying toward the downstream RAMSAR site	Installation of markers and bird diverters on power lines	None foreseen as power lines will be removed at closure
Haul route	Impact on air quality by dust generation from vehicle entrainment on unpaved portions of the haul route	Dust suppression techniques to be implemented	Unlikely unless there is ineffective rehabilitation resulting in exposed areas susceptible to wind erosion
	Vehicle tailpipe emissions from haul trucks	Vehicle maintenance measures, fuel choice measures, air cleaning technology measures to be implemented if standards are exceeded	None foreseen as hauling activities will cease at closure
	Loss of plant species of conservation concern if unpaved portions of the haul	A permit to be obtained for removal and relocation if plant species of conservation	The impact of loss if mitigation is not implemented effectively remains

ACTIVITY whether listed or not listed. **(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).**	**POTENTIAL IMPACT** **(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)**	**MITIGATION TYPE** **(modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)** **E.g.** **Modify through alternative method.** **Control through noise control** **Control through management and monitoring through rehabilitation...**	**POTENTIAL FOR RESIDUAL RISK**
	road are graded and widened without the relocation of species	concern are to be impacted	
	Disturbance of cemetery at ME operations when unpaved portions of the haul road are graded and widened	A buffer zone of 30 m as recommended by the specialist to be left between the haul route and fence boundary of the cemetery	None foreseen as the impact if the 30 m buffer zone is respected
	Indirect impact of mining on historic mine house which may be of cultural heritage concern	The access portion of the haul route has been re-routed to avoid passing the historic mine house and other dwellings	None foreseen as the access portion of the haul route has been re-routed
	Positive impact on the integrity of the floodplain wetland associated with the Blesbokspruit at the low level crossing	Positive impact does not require mitigation. The positive impacts will be enhanced by constructing the culvert as per the recommendations of the hydrology and wetland specialists	Positive impact on wetlands as the upgrade to the low level crossing, which is to remain in place after closure, will result in a more natural flow regime for the floodplain wetland associated with the Blesbokspruit
	Nuisance noise generated by haul trucks passing Welgedacht on Carnation Road	Restricting hauling to daytime hours	None foreseen as hauling activities will cease at closure
	Traffic safety implications due to haul trucks turning onto and across Pansy Road and travelling along Carnation Road	Decrease speed limits on haul route, construct designated turning lanes at affected intersections, limit hauling to daylight hours	None foreseen as hauling activities will cease at closure
	Traffic safety implications for inhabitants living within the historical mine buildings near the shaft	Community traffic safety awareness campaigns will need to implemented and drivers will need to be made aware of the possibility of local residents being on the roads	None foreseen as hauling activities will cease at closure
	Degradation of the road surfaces due to haul trucks	Regular maintenance of haul routes is to be conducted	None foreseen as hauling activities will cease at closure and roads will be repaired as part of rehabilitation

13) OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

a) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

i) Impact on the socio-economic conditions of any directly affected person **(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix and confirm that the applicable mitigation is reflected herein)**

A socio-economic study is currently being conducted by Prime Resources.

Directly affected persons are: the landowners of the Remaining Extent of Holfontein 71 IR and Ptn 68 of Holfontein 71 IR namely Dwarstrek (Pty) Limited and Berman Leslie Toby respectively; the Khomponi community, who currently reside in the historical mine buildings and informal structures nearby; and the Welgedacht smallholdings. The Remaining Extent of Holfontein 71 IR will be purchased by the mine – this is in the process of being finalised. The Applicant will notify the other landowner of Ptn 68 of Holfontein 71 IR, and necessary compensation will be discussed for the area where the ventilation shaft and associated infrastructure is to be located.

The Khomponi community is located within 200 m of the proposed surface infrastructure, and will be directly affected by the construction and operation of the shaft and associated infrastructure.

The Welgedacht smallholdings along Carnation Road will be affected by nuisance impacts along the haul road.

From an initial investigation for the Scoping Phase, potential socio-economic impacts include:

- Nuisance impacts of dust, noise and visual intrusion (including lighting at night) on the residential areas within 200 m of the proposed site;
- Nuisance noise of the haul trucks passing the Welgedacht smallholdings along Carnation Road;
- Health impacts of emissions of criteria pollutants (i.e. PM_{10}, $PM_{2.5}$ etc.) from operations on the residential areas within 200 m of the proposed site;
- Traffic nuisance and safety implications of haul trucks on the haul route; and
- Influx of job seekers into the area resulting in pressure on existing infrastructure, decreased sanitation due to lack of services, and an increase in crime and social ills.

Possible mitigation measures for the potential impacts identified during the high level impact assessment has been included in Section 11)c)iii).

A socio-economic impact assessment is currently being conducted to confirm and assess the impacts. Mitigation measures for identified impacts will be included in the EMPr. The current baseline study does refer to the relevant legislation.

ii) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act **(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as an Appendix and confirm that the applicable mitigation is reflected herein)**

A baseline cultural and heritage study was conducted by Apelser Archaeological Consulting in April 2015 (attached as Appendix 7). A number of sites and features were identified in the project area, all relating to historical gold mining at Holfontein. The features have been identified as not being of significance from a cultural heritage point of view and can therefore be demolished.

The baseline study identified a site located adjacent to the project site, an old house, which possibly dates to the 1940s. The study went on to say that it is in a relatively good state of preservation, and that an architectural historian be consulted to undertake a detailed study of this structure. It must be noted however that this historical mine house is currently inhabited. Further, the access road that previously passed near this house has been re-routed so that the house will not be directly impacted by the project. Mitigation measures to ensure that the historic mine house is not impacted by the proposed project have been included in Section 11)c)iii) and will also be included in the EMPr.

Alongside the proposed haul road, in close proximity to the ME operations, is a cemetery that contains historical and modern graves. It is situated approximately 30 m away from the haul road, and any road expansion and truck activity could possibly impact on the cemetery. The cemetery was identified during 2006 by the Mine who indicated their willingness to keep the cemetery intact and to preserve it while still allowing access to descendants. As graves have a high significance rating from a cultural heritage point of view it is recommended that the site continue to be preserved and that a 30 m buffer be maintained between the proposed haul road and the boundary fence of the cemetery. This mitigation measure has been included in Section 11)c)iii). This measure will also be included in the EMPr.

b) Other matters required in terms of sections 24(4)(a) and (b) of the Act **(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as an Appendix)**

Site, layout, technological and operational alternatives have been assessed for the project thus far, as required by section 24(4)(b)(i) (refer to Section 9). This site screening assessment compares various aspects of the sites and further serves as an investigation into the potential impacts of the alternatives. The preferred initial layout was determined to be the most suitable for development (refer to Figure 2 in Section 11)c)). Should further alternatives be identified during the scoping phase stakeholder engagement process, these will be assessed before finalising the site layout.

The EIAR will address the following requirements in terms of sections 24(4)(a) and (b) of the Act:

SECTION OF NEMA	CONTENTS	DESCRIPTION OF HOW THE ASPECT HAS BEEN ADDRESSED THUS FAR AND WILL BE FURTHER ADDRESSED DURING THE EIA
Section 24(4)(a)		
24(4)(a)	Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment – must ensure, with respect to every application for an environmental authorisation—	Refer to Section 12) for the plan of study for the EIA process.
24(4)(a)(i)	Coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;	The Scoping Report and EIAR will be made available to all the relevant organs of state, including DWS for the activities requiring a WUL, for comment during the stakeholder engagement processes. The DMR remains the Competent Authority. Refer to Section 10).
24(4)(a)(ii)	That the findings and recommendations flowing from an investigation, the general objectives of integrated environmental management laid down in this Act and the principles of environmental management set out in section 2 are taken into account in	The general objectives of integrated environmental management laid down in NEMA and the principles of environmental management set out in section 2

SECTION OF NEMA	CONTENTS	DESCRIPTION OF HOW THE ASPECT HAS BEEN ADDRESSED THUS FAR AND WILL BE FURTHER ADDRESSED DURING THE EIA
	any decision made by an organ of state in relation to any proposed policy, programme, process, plan or project;	will be addressed in the EIAR and EMPr.
24(4)(a)(iii)	That a description of the environment likely to be significantly affected by the proposed activity is contained in such application;	Refer to Section 11)a) for a detailed description of the baseline environment likely to be affected by the project.
24(4)(a)(iv)	Investigation of the potential consequences for or impacts on the environment of the activity and assessment of the significance of those potential consequences or impacts; and	Refer to Section 11)c) for an initial identification and assessment of the potential impacts. A detailed impact assessment will form part of the EIA phase.
24(4)(a)(v)	Public information and participation procedures which provide all interested and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures; and	Refer to Section 10) which details the scoping phase stakeholder engagement process followed. Further stakeholder engagement will be conducted during the EIA phase. Refer to Section 12)e).
24(4)(A)	Where environmental impact assessment has been identified as the environmental instrument to be utilised in informing an application for environmental authorisation, subsection (4)(b) is applicable	Environmental impact assessment has been identified as the environmental instrument therefore (4)(b) is applicable.
Section 24(4)(b)		
24(4)(b)	Must include, with respect to every application for an environmental authorisation and where applicable—	
24(4)(b)(i)	Investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity;	Alternatives have been investigated and assessed for the project thus far. Refer to Section 9). The final layout will be assessed during the EIA and based on the outcome, recommendations will be made in terms of further layout and

SECTION OF NEMA	CONTENTS	DESCRIPTION OF HOW THE ASPECT HAS BEEN ADDRESSED THUS FAR AND WILL BE FURTHER ADDRESSED DURING THE EIA
		technological alternatives which may be required.
24(4)(b)(ii)	Investigation of mitigation measures to keep adverse consequences or impacts to a minimum;	Mitigation measures for potential impacts identified during the initial assessment have been identified. Refer to Section 11)c)iii). A detailed impact assessment will further form part of the EIA phase. Refer to Section 12) for the plan of study for the EIA process. Mitigation measures will also be recommended accordingly.
24(4)(b)(iii)	Investigation, assessment and evaluation of the impact of any proposed listed or specified activity on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), excluding the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act;	The National Heritage Resources Act has been taken into account. Refer to sections 5), and 0. Heritage considerations will form part of this environmental process.
24(4)(b)(iv)	Reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information;	These have already been addressed to some extent in the specialist baseline studies conducted (Appendices). These will be further addressed in the EIAR.
24(4)(b)(v)	Investigation and formulation of arrangements for the monitoring and management of consequences for or impacts on the environment, and the assessment of the effectiveness of such arrangements after their implementation;	Monitoring and management of consequences for or impacts on the environment will be provided for in the EMPr in terms of management measures to mitigate potential impacts and commitments to undertake the required EMPr performance audits.
24(4)(b)(vi)	Consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3); and	Refer to Section 11)a) for maps indicating the geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes informed by maps compiled by relevant
24(3)	The Minister, or an MEC with the concurrence of the Minister, may compile information and maps that specify the attributes of the environment in particular geographical	

SECTION OF NEMA	CONTENTS	DESCRIPTION OF HOW THE ASPECT HAS BEEN ADDRESSED THUS FAR AND WILL BE FURTHER ADDRESSED DURING THE EIA
	areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every competent authority.	departments.
24(4)(b)(vii)	Provision for the adherence to requirements that are prescribed in a specific environmental management Act relevant to the listed or specified activity in question.	Listed activities for the Holfontein Project have been identified. Refer to Section 4)a). Environmental impact assessment has been identified as the environmental instrument.

14) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I Gené Main**herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.**

Signature of the EAP
DATE: 9 June 2015

15) UNDERTAKING REGARDING LEVEL OF AGREEMENT

I Gené Main**herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.**

Signature of the EAP
DATE: 9 June 2015

-END-