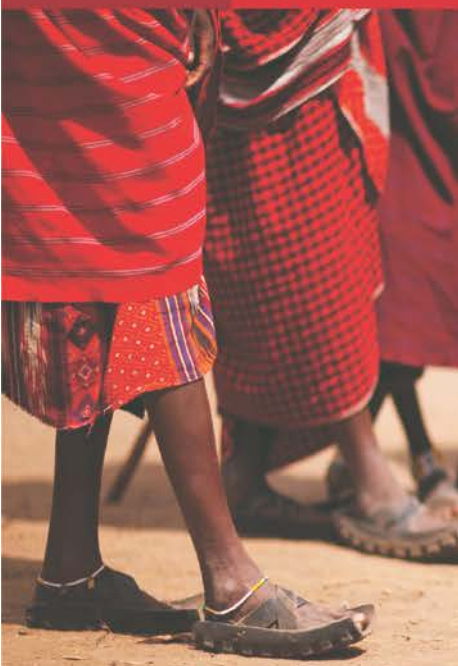


DIGBY WELLS
ENVIRONMENTAL



Heritage Component of the Environmental Impact Assessment for the Grootegeluk Expansion Project

Notification of Intent to Develop

Project Number:

EXX2768

Prepared for:

Exxaro Resources (Pty) Ltd

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Project Name:	Heritage Component of the Environmental Impact Assessment for the Grootegeluk Expansion Project
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NOTIFICATION OF INTENT TO DEVELOP

Introduction

Digby Wells Environmental (hereafter Digby Wells) has been contracted by Exxaro Coal (Pty) Ltd (hereafter Exxaro) to conduct a Basic Assessment Report for the Grootegeluk Expansion Project according to the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Water Use Licence Application (WULA) according to the National Water Act, 1998 (Act No. 36 of 1998) (NWA). It also includes an Atmospheric Emissions Licence (AEL) in accordance with the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA), as well as an amendment in terms of the provisions of Section 102 the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), to its Environmental Management Programme (EMP).

Project Location

Name of property	Grootegeluk
Erf or farm numbers	Daarby 458 LQ Enkelbult 562 LQ Appelvlakte 448 LQ Portion1 and Re Nelsonskop 464 LQ Portion 1
Coordinates of approximate centre of project area	-23.642847/27.558117
1: 50 000 Topographical map number	2327DA Ellisras
Nearest Towns	Lephalale
Magisterial district	Ellisras Magisterial District
District municipality	Waterberg District Municipality
Local municipality	Lephalale Local Municipality
Maximum extent of proposed development	168 ha in total
Current use	Open cast coal mining
Predominant land use/s of surrounding properties	Mining operations

Project/Development Details

Exxaro intends to expand their Grootegeluk Coal Mine, located approximately 20 km west of Lephalale in the Limpopo Province. This expansion is to ensure adequate supply for Eskom's Medupi Power Station, once it comes online towards the end of 2014.

An application for amendment of the existing Grootegeluk Coal Mine Mining Right will also be made to the Department of Mineral Resources (DMR) in accordance with NEMA and the MPRDA. In addition, an Integrated Water Use Licence Application (IWULA) will be submitted in accordance with the National Water Act, 1998 (Act No. 36 of 1998) (NWA), as well as an AEL in accordance with the NEM: AQA.

NHRA Section 38 Triggers

The following activities may require a Heritage Impact Assessment (HIA) in terms of Section 38 of the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA).

		NHRA Section 38 (1) Activities / Triggers		Summary description (E.g. 500 m conveyor belt, open cast pit, etc.)
<input checked="" type="checkbox"/>	a	Any linear development or barrier >300 m		<ul style="list-style-type: none"> ■ Expansion of the existing rail loop (2.5 km); 33Kv Power line (9 km) and New road (2 km)
<input type="checkbox"/>	b	Any bridge or similar structure >50 m		
<input type="checkbox"/>	c	Any development or activity that will change the character of a site:		
<input checked="" type="checkbox"/>	i		≥5 000m ² in extent	<ul style="list-style-type: none"> ■ Coal Stockyard expansion (approximately 48 ha); and ■ Car park and gate covering an area of 0.6 ha
<input type="checkbox"/>	ii		Involving ≥3 existing erven/ subdivisions	
<input type="checkbox"/>	iii		Involving ≥3 or more erven/ divisions consolidated within past 5 years.	
<input type="checkbox"/>	d	Rezoning of a site ≥10 000m ² in extent.		
<input checked="" type="checkbox"/>	8	Other triggers, e.g.: in terms of other legislation, (i.e.: National Environment Management Act, etc.)		MPRDA, NEMA, MWA, NEM:AQA

Activities

The following activities will take place during the lifespan of the proposed project.

Identified Project Activity (including Listed Activities)	Description	Development as defined in NHRA	Trigger for HIA	Sources of risk to heritage resources	Project Phase
GN R544 22	<p>The construction of a road, outside urban areas,</p> <ul style="list-style-type: none"> i. With a reserve wider than 13.5 m; or ii. Where no reserve exists where the road is wider than 8 m. <p>The construction of the proposed road will be 20 m in width and 2 km in length.</p>	2 (viii) a, e & f	<p>38 (1) a</p> <p>The construction of a linear development exceeding 300 m</p>	Potential damage or destruction to sub-surface heritage resources	■ Construction
GN R544 28	The expansion of or changes to existing facilities for any purpose or activity where such expansion or changes to will result in the need for a permit or licence in terms of national or provincial legislation governing the release of emissions or pollution.	2 (viii) a	<p>38 (8)</p> <p>If an evaluation of impacts is required in terms of NEMA or MPRDA</p>	Potential damage or destruction to sub-surface heritage resources	■ Construction
GN R544 53	“The expansion of railway lines, stations or shunting yards where there will be an increased development footprint...”	2 (viii) a, f	<p>38 (8)</p> <p>If an evaluation of impacts is required in terms of NEMA or MPRDA</p>	Potential damage or destruction to sub-surface heritage resources	■ Construction

Additional Impact Assessment Process

The following impact assessment processes are currently being undertaken for the proposed project.

Legislation, i.e. NEMA, MPRDA, etc.	NEMA, MPRDA, NWA, NEM:AQA
Consenting Authority that has/will receive information	Department of Environmental Affairs (DEA)
Reference Number	LEDET Ref No.: 12/1/9/1-W89 NEAS Ref No.: LIM/EIA/0000882/2014
Present phase of process at Authority, e.g. Draft Scoping Report	Draft Basic Assessment Report

Identified/known heritage resources and potential impacts

The following categories of heritage resources as defined in Section 3 of the NHRA are known to occur within the proposed project area.

<input type="checkbox"/>	3(2)(a)	Places, buildings, structures and equipment of cultural significance <i>Description of resource:</i> None <i>Potential impact:</i> None
<input type="checkbox"/>	3(2)(b)	Places to which oral traditions are attached or which are associated with living heritage <i>Description of resource:</i> None <i>Potential impact:</i> None
<input type="checkbox"/>	3(2)(c)	Historical settlements and townscapes <i>Description of resource:</i> None <i>Potential impact:</i> None
<input type="checkbox"/>	3(2)(d)	Landscapes and natural features of cultural significance <i>Description of resource:</i> None <i>Potential impact:</i> None
<input type="checkbox"/>	3(2)(e)	Geological resources of scientific or cultural importance <i>Description of resource:</i> None

		<i>Potential impact: None</i>
<input type="checkbox"/>	3(2)(f)	Archaeology and/or palaeontology (Including archaeological sites and material, fossils, rock art, battlefields & wrecks)
		<i>Description of resource: None</i>
		<i>Potential impact: None</i>
<input type="checkbox"/>	3(2)(g)	Graves and burial grounds (e.g.: ancestral graves, graves of victims of conflict, historical graves & cemeteries)
		<i>Description of resource: None</i>
		<i>Potential impact: None</i>
<input type="checkbox"/>	3(2)(a)	Other human remains
		<i>Description of resource: None</i>
		<i>Potential impact: None</i>
<input type="checkbox"/>	3(2)(h)	Sites of significance relating to the history of slavery in South Africa
		<i>Description of resource: None</i>
		<i>Potential impact: None</i>
<input type="checkbox"/>	3(2)(i)	Movable objects
		<i>Description of resource: None</i>
		<i>Potential impact: None</i>

Recommendations

Is a Heritage Impact Assessment required?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<p>If NO, provide motivation: The project area is located within an operational mine area, and no heritage resources have been identified during this assessment. A total of 95 % of the project area is located within disturbed areas, while the remaining 5 % is located in an area (the new rail loop and gate infrastructure) that has seen little development, other than that of the railway construction. The new rail loop will disturb approximately 2.5 km of undisturbed land and the parking lot/gate infrastructure will disturb 0.6 ha of undisturbed land.</p> <p>Chance Finds Procedures are recommended for the excavations for the rail loop, and a Watching Brief is recommended for the ground clearance for the parking lot/gate infrastructure. These must be implemented in the EMP</p>		

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LIST OF ABBREVIATIONS AND TERMS

CFP	Chance Finds Procedures
DEA	Department of Environmental Affairs
EIA	Environmental Impact Assessment
EMP	Environmental Management Programme
ESA	Early Stone Age
GN	Government Notice
GSSA	The Genealogical Society of South Africa
HIA	Heritage Impact Assessment
HRA	Heritage Resources Authority
LLM	Lephalale Local Municipality
LSA	Later Stone Age
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MSA	Middle Stone Age
NASA	The National Archives of South Africa
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NID	Notification of Intent to Develop
NWA	National Water Act, 1998 (Act No. 36 of 1998)
SAHRA	South African Heritage Resources Agency
SAHRIS	The South African Heritage Information System
WULA	Water Use License Application

1 Introduction

Digby Wells Environmental (hereafter Digby Wells) has been contracted by Exxaro Coal (Pty) Ltd (hereafter Exxaro) to complete a Basic Assessment Report (BAR) for the Grootegeluk Expansion Project. This will be conducted according to the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and Water Use Licence Application (WULA) according to the National Water Act, 1998 (Act No. 36 of 1998) (NWA), as well as an amendment in terms of the provisions of Section 102 the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), to its Environmental Management Programme (EMP) (the Section 102 Amendment).

1.1 Terms of Reference

The Grootegeluk Expansion Project required specialist studies to obtain environmental authorisation in terms of the MPRDA, NEMA, and NWA.

1.2 Scope of Work

To comply with the legislative requirements, a heritage study for the Grootegeluk Expansion Project inclusive of a Notification of Intent to Develop (NID) for submission to the relevant Heritage Resources Authority (HRA) was required. This included:

- Review of relevant previous heritage studies in the study area;
- Completing historical layering for the project area;
- Undertaking a site screening survey ;
- Reporting; and
- Providing recommendations for further heritage assessments.

2 Project Background Information

Exxaro intends to expand some of the infrastructure that forms part of the Grootegeluk Coal Mine, located approximately 20 km west of Lephalale in the Limpopo Province. This infrastructure expansion is to ensure adequate supply for Grootegeluk's customers, including Eskom. The expansion will consist of the following activities:

- Expansion of the rail loop, load out stations and associated infrastructure;
- Expansion of the existing coal stock yard and stockpiles;
- Expansion of the fuel storage depot;
- Expansion of beneficiation plants and associated infrastructure
- New road or conveyors to fines recovery area;
- New gate and hard park area; and

- New 33kV power line.

The upgrading and construction of all infrastructure associated with the project will be within the Grootegeluk Coal Mine project boundary. The expansion will be within currently disturbed areas of the mine, with the exception of the new rail loop, fines recovery conveyor and the gate which will be located within fragmented areas of undisturbed land.

2.1 New Rail Load-out Station Project:

The rail infrastructure entails the construction of a new double-rail loop, two departures lines and the expansion of the existing shunt yard. The rail line will be flanked on either side by a service road; the width of the rail line and service road will be approximately 20 m.

Due to an increase in market demand and production, greater logistical infrastructure is required on the mine to export its products to the local and international markets. This project is the enabler of all current and future projects on Grootegeluk and consists of a number of elements namely:

- Construction of a new rail loop of approximately 2.5 km to replace the existing D8 rail loop. This will accommodate the increase of rail traffic to Grootegeluk and allow for the loading of 200 wagon trains in the future. Included in this element is an approximate 480 m extension of the rail shunt yard to stage the trains after arrival and before departure;
- The rail line will be flanked on either side by a service road; the width of the rail line and service road will be approximately 20 m.
- Extension of the existing GG4/5 stockyard to its full capacity. The three existing stackers will be upgraded and the reclaimer will be replaced by a higher capacity machine to feed the new Load-Out Stations;
- Construction of a new Rail Load-Out Station to load the coal multi-products on trains;
- Construction of a new Road Load-Out Station to load the coal multi-products onto trucks; and
- Construction of conveyors, roads, stormwater channels and all other associated infrastructure to feed and support the above mentioned facilities.

The coal stockyards will be expanded and are located within the proximity of the load out stations alongside the rail infrastructure and existing stockyards. The stockyards will all be within currently disturbed areas.

2.2 New Stockyards and Stockpiles

2.2.1 GG 6/2 Stockyard

The aim of the GG6 expansion project is to increase the amount of semi-soft coking coal (SSCC) product from the GG2 & 6 plants. The increase in the SSCC product will be achieved by making some internal modifications on both the GG2 and GG6 plants. This plant also produces power station coal (PSC) that is sent to the Matimba power station.

The scope of the changes at the existing GG6 stockyard includes;

- Stockpiles will be extended to a size of 13 ha
- New stacker on the GG6 side of the stockpiles
- Extension of the new multi-product conveyor; and
- Substation upgrades.

The new stacker will operate across the entire length of the GG6 stockpiles to accommodate the new extension. The new multi-product conveyor will be extended to connect with the rapid load out station, allowing flexibility in terms of final product destination. The substation at the stockyard will be upgraded to accommodate equipment changes.

The upgraded plant will process 18.8 Mt per annum of run-of-mine (ROM); this is inclusive of an additional 600 tph to the current ROM. As a result of these upgrades, SSCC production will increase to 2.2 million tons per annum, and a reduction in PSC to 5.7 million tons.

2.2.2 GG10 Stockyard

Grootegeluk wants to expand its multi-product coal production with an additional 2 Mt per annum. To achieve this, a plant similar to the GG 4 & 5 plant needs to be constructed and will be known as GG10 at a size of 35 ha.

The current delays in constructing Eskom's Medupi power station allows for the newly constructed GG 7 plant to produce the required metallurgical coal, while the GG10 plant is being constructed. This plant however needs to be modified to split the current power station coal product flow from the GG 7 & 8 plant into a new stream that can be typically split into three products, namely:

- Small nuts (-50mm + 25mm) with 10 – 15% ash content;
- Peas (-25mm + 10mm) with 10 – 15% ash content; and
- Power station coal (-10mm) as per current design.

The required plant modifications are:

- Remove two of the existing crushers in the GG 7 module;

- Installing of a new product conveyor to take the product to a new crushing and screening plant;
- Construction of a new crushing and screening plant where the products will be split into small nuts, peas and power station coal;
- Construction of three new product conveyors that will take the products to the required stockpiles and yards;
- Construction of two lined conical stockpiles with capacities of approximately 5000 tons each for phase 1 of the project. These stockpiles will be loaded out by means of a Front End Loader (FEL) and 20 – 40 ton haul trucks to:
 - Existing stockpiles to load product via existing stockyards to rail load out for export.
 - Existing Exxaro Reductants plant feed stockpiles
 - Supplied to existing clients collecting coal from Grootegeluk.
- Phase 2 will consist of a new multi-product stockyard with stackers and a reclaimer joining up with the new proposed load out system to export the product from the mine via rail.
- Electrical and control systems will be tied into the existing GG 7 & 8 infrastructure.
- Storm water management will be designed to tie in with the existing infrastructure around the proposed locations of the new plants and stockyards.

Phase 1 of the project is being executed within the approved GMEP project construction area.

For phase 2 of the project, three areas for stockyard locations are currently being considered as indicated on the blockplan.

2.2.3 Multi-product Overflow Stockyard

For the start-up of Medupi Power station, Grootegeluk wants to build a Strategic/Overflow Stockyard to be able to supply Medupi with sufficient coal. This stockyard will also be used for product stockpiling when the GG7/8 stockyard is at full capacity, to prevent plant shut down. The Multi-Product Overflow stockyard can be used for a variety of different products and plants and will be reclaimed to feed all Load-Out Stations and conveyors, as required. The Multi-Product Overflow Stockyard will be designed according to the same standard as all new Grootegeluk stockyards.

2.2.4 Design of New Stockyards

According to the NWA, with specific reference to GN704 on the use of water for mining and related activities, any person in charge of a mine or activity must:

- Collect the water arising within any dirty area, including water seeping from mining operations, outcrops or any other activity, into a dirty water system; and
- Prevent water containing waste or any substance which causes or is likely to cause pollution of a water resource from entering any water resource, either by natural flow or by seepage, and must retain or collect such a substance or water containing waste for use, re-use, evaporation or for purification and disposal in terms of the Act.

The two paragraphs above, as per the Act, formed the basis of the hydrological criteria for the civil design of the stockyard expansions. The coal product stockyard catchment area is classified as dirty which requires run-off to be contained and prevent seepage of dirty water into clean water resources.

The stockyard lining is vital for compliance with GN704 as it must be 100% impervious to seepage and allow for efficient drainage of run-off, class C type of barrier will comply. The lining must also be structurally capable of supporting the weight of the stockyard and/or heavy loading vehicles. Therefore all new stockyards will be covered with a final layer of concrete, underlain by a 1.5 mm thick continuous HDPE liner. This concrete-HDPE liner system complies with the above mentioned requirements.

The surface slab will be on top of a series of structural layer works to ensure distribution of loads across the stockyard. A layer of Kaytech Kaytape will be installed between the final compacted layer of G5 material and an HDPE liner. This Kaytape layer will prevent the 1.5 mm HDPE liner from being damaged while pouring the concrete.

The stockyard slab is sloped to drain dirty water into a concrete box drain (with silt traps and sumps), that runs parallel to the stockyard. From the sump the dirty water is pumped into the mine's overall dirty water handling system. The concrete box drains have removable precast concrete dog-bone covers which allows for easy access during maintenance.

Any stockyard in proximity to a clean water area will also be isolated with a berm and swale combination, sized to contain a 1:50 year flood event. This stockyard design will ensure the efficient collection and handling of dirty water and prevent pollution of clean water resources.

2.3 Fuel Depot Upgrade

Currently Grootegeluk has a total storage capacity of 1 329 m³, operated by Total, for its mining vehicles. With the current and future fleet expansions and in-pit crushing and conveying (IPCC) system that are planned, the fuel storage capacity needs to increase to approximately 3 750 m³. This project will entail the installation of two new 1 140 m³ fuel tanks with associated infrastructure, at the existing fuel depot premises. The total bunded capacity is sufficient to withhold the largest tank failure capacity in accordance with SANS 10089-1:2008. Grootegeluk shall comply with the relevant Health and Safety procedures as prescribed by the Mine Health and Safety Act, NO29 of 1996. In addition this facility will comply with the Mines Emergency Preparedness Procedure (WB RS A01 003 Emergency

plan 2014-2015 Rev 10) and relevant Standard Operating Procedure (SPI: GG/H03.005) with regards to flammable substances.

2.4 Fines Recovery

Grootegeluk has a Tailings Storage Facility (TSF) that has been operational since the commencement of the mine. In order to reduce the size of the TSF and extend its life, Grootegeluk propose to reclaim the fine tailings and blend it into the power station coal that is sold to Matimba and Medupi power stations. To blend, the fines need to be transported from the TSF to the blending location. The operational solution consists of the following:

- Construction of a new road next to the new rail loop that will allow trucks to transport the reclaimed fines tailings to the blending location of the power station coal product conveyors;
- Construction of a new conveyor from the Fines Tailings Dam to the power station conveyors, with buffer stockpiles at the fines tailings dam and the provincial road. These stockpiles will also be designed according to the abovementioned specification.

2.5 Warehouse Gate Expansion

The Reductants Plant is being operated as a separate Business Unit from Grootegeluk Coal Mine and their personnel need direct access to their premises. Currently they are using the Grootegeluk Medupi Expansion Project (GMEP) construction gate. The new rail loop will intersect with the existing GMEP construction gate facility, which has necessitated its relocation. The gate facility will be relocated next to the existing Warehouse as indicated on the blockplan and will be approximately 6 000 m² and will be located to the north of the Grootegeluk Coal Mine plant.

2.6 New 33kV power line

The new 33kV power line will run from the existing substation to a switching station to supply power to the new infrastructure. In addition to the overhead power line a new 33kV switchyard will also need to be constructed near the Grootegeluk Lab.

The power line will be approximately 9 km long and will be a double circuit line with twin goat conductors on each phase. Each overhead line will be capable of transmitting approximately 80MVA and will cater for a number of future projects at Grootegeluk. In addition the overhead line project will create spare capacity while the existing network is rationalised and consolidated.

Once completed the overhead power line will serve as an interconnection between the main substation, main pit substation and north pit substation.

2.7 Ancillary infrastructure

2.7.1 New Canteen

As a result of the Grootegeluk expansion there is a larger workforce, and more contractors on site. The existing Canteen does not have sufficient capacity to service the increased staff complement, nor does it comply with the mine's health and safety standard. To address this, a new Canteen will be constructed (as indicated on the blockplan) with sufficient capacity and according to the required Health & Safety standards, to replace the existing one.

2.7.2 New HDV Workshop

The Heavy Delivery Vehicle (HDV) Workshop is used to service, repair and rebuild the primary and secondary mine vehicles of Grootegeluk. The current HDV Workshop does not have sufficient capacity to cater for the expansion of the mine's primary and secondary fleet. Concrete rehabilitation and structural repairs will also be made to the existing HDV Workshop, which will decrease its capacity for the duration. An additional HDV Workshop will be built to service the growing fleet of primary and secondary mine vehicles and to meet demand during the structural repairs of the existing one.

2.7.3 Temporary Hazardous Waste Facility

Grootegeluk is also increasing their Temporary Hazardous Waste Storage capacity by building a new facility near the existing one. This facility is geared to temporarily store the hazardous waste generated on the mine until it is transported to a licensed facility off-site (Holfontein Landfill Site), in terms of NEM; Waste Act NO59 of 2008.. The facility is 736m² in size and is located in the old Stores area, which has been relocated to the new Warehouse, and will be roofed and bunded. . This facility has been registered with the Department of Environmental Affairs (DEA) under reference no. 12/9/11/STO6/5.

2.7.4 Waste Tyre Storage Site

A waste tyre storage site will be installed to cater for the expansion of the mine vehicle fleet. This area will entail an earthworks prepared area with drainage channels where the used tyres from the primary mining vehicle will temporarily be stored until it is disposed of to a designated facility off-site from the mine. This facility will have a size of 26 310 m² which is below the threshold of 30 000 m² as prescribed the Waste Tyre Regulations promulgated on 30-February-2009. The site on which the Waste Tyres will be stored shall meet the minimum requirements as set out under Regulation 16(6) of the Waste Tyres Regulations. This facility has been registered with the Department of Environmental Affairs (DEA) under reference no. 12/9/11/STO7/5.

2.7.5 In Pit Crushing and Conveying (IPCC)

With the increase of the Grootegeluk mine pit shell, hauling distances are continuously increasing. To reduce hauling distance and prevent additional hauling equipment requirements, an IPCC system is envisaged.

The IPCC project consists of two 6000 tph systems which will crush, collect and transport conveyors positioned on the northern side of the existing pit feeding the GG2/6 and GG1 plants respectively.

The IPCC system consists of four semi mobile crushing stations with production capacity of 3000 tph, each located within the current pit, in the Bench 4 elevation. The haul truck transports the Run-off-Mine (ROM) material from the shovel to the semi-mobile crusher. The semi-mobile crusher units crush and discharge ROM onto the two bench collecting conveyors with production capacity of 6000 tph each. The two bench collecting conveyors discharge onto two transport conveyors which take the ROM material out of the pit.

As the mine progresses (and haul distance increases) the semi-mobile crusher is relocated at fixed intervals to limit haul distance. When the semi-mobile crushers are relocated the bench collecting conveyor is extended to tie-up with the new position.

A radial telescopic stacker and stockpile is provided for each of the two conveyor systems to empty each conveyor system in the event of plant shutdown and to provide a buffer in front of the plants to ensure consistent ROM material supply to the beneficiation plants. The material on these stockpiles will be reclaimed with front-end loaders and hauled to the tip bins when required. All of this infrastructure will be built in the current mining area.

2.8 Relevant Contact Details

The contact details of the developer, consultant and landowners are provided in Table 2-1, Table 2-2 and Table 2-3 respectively.

Table 2-1: Client Contact details

ITEM	COMPANY CONTACT DETAILS
Company	Exxaro Resources (Pty) Ltd
Contact person	Filomaine Swanepoel
Tel no	014 763 9288
Fax no	012 307 5437
Cell no	083 622 1104
E-mail address	filomaine.swanepoel@exxaro.com
Postal address	P. O. Box 9229, Pretoria

Table 2-2: Consultant contact details

ITEM	COMPANY CONTACT DETAILS
Company	Digby Wells Environmental
Contact person	Marcelle Radyn
Tel no	011 789 9495
Fax no	011 789 9498
Cell no	082 442 1405
E-mail address	marcelle.radyn@digbywells.com
Postal address	Private Bag X10046, Randburg, 2125

Table 2-3: Land owner contact details

ITEM	CONTACT DETAILS
Title Deed Owner	Exxaro Coal (Pty) Ltd - Grootegeluk
Contact person	Mervin S Govender
Work no	014 763 9099
Cell no	083 286 3273
Postal address	P. O. Box 178, Lephale

3 Development Context of the Study Area

The development and planning context in which the proposed Grootegeluk Expansion Project will operate was summarised from the following sources:

- Statics South Africa (http://beta2.statssa.gov.za/?page_id=993&id=lephalale-municipality, accessed 25/04/2014);
- *Lephale Local Municipality Integrated Development Plan 2013-2016*. Lephale Local Municipality: Lephale; and
- *Waterberg District Municipality 2013/14 IDP*. Waterberg District Municipality.

The socio-economic status of Lephale was concluded from statics from the Lephale Local Municipality (LLM) IDP and Stats SA (2011). The LLM is approximately 14 000 km² and has a total population of 115 767 people at a population density of 8 persons/km². Of the total population only 35 327 (30.5%) are economically active with 10 100 (9%) unemployed individuals (Ranked 142nd in the country with regards to the unemployment rate). Education levels and income levels are depicted in Table 3-1 and Table 3-2 below:

Table 3-1: Education levels within the LLM (Stats SA, 2011)

Group	Percentage
No Schooling	2,4%
Some Primary	37,7%
Completed Primary	6%
Some Secondary	35,9%
Completed Secondary	11,9%
Higher Education	1,5%
Not Applicable	4,6%

Table 3-2: Average Household income for the LLM (Stats SA, 2011)

Income	Percentage
No income	12,5%
R1 - R4,800	3,2%
R4,801 - R9,600	6,3%
R9,601 - R19,600	16,3%
R19,601 - R38,200	20,2%
R38,201 - R76,4000	15,4%
R76,401 - R153,800	11,2%
R153,801 - R307,600	7,9%
R307,601 - R614,400	4,7%
R614,001 - R1,228,800	1,5%
R1,228,801 - R2,457,600	0,4%
R2,457,601+	0,2%

The Gross Domestic Product (GDP) of the LLM is largely dependent on the mining and energy sectors, contributing approximately 59% and 11% respectively. The agricultural sector, however, is the largest employer, employing around 39% of the local workforce.

The LLM IDP places special emphasis on the tourism sector with reference to the rich eco-tourism of the municipality. This has been highlighted as a key point of economic growth and expansion (Lephalale Local Municipality, 2013). Another factor that was highlighted in the IDP is that of the vast coal reserves present within the municipal area. The Waterberg District Municipality (WDM) has also highlighted the importance of the Lephalale Coal fields and states that it is important to the development of not only the local and district municipalities, but the Province and the country as a whole (Waterberg District Municipality, 2013). The Grootegeluk Project has been grouped with Medupi and a project of national strategic importance (Lephalale Local Municipality, 2013). The growth rate of the LLM is ranked 17th country wide, with a growth rate of 3.06% making it the fastest growing local municipality in the WDM (Statistics South Africa, 2011).

In summary, while tourism has been highlighted as a strong factor for growth in the area, the mining sector will be the main driver of development for the LLM. The nature of mining development therefore poses significant cumulative impacts on the cultural landscape and heritage resources.

4 Legislative Framework

The NID considered a legal framework that includes the MPRDA, NEMA and NHRA. The applications of these Acts are discussed below.

4.1.1 MPRDA

A Section 102 Amendment does not explicitly require a heritage study and therefore does not trigger a NHRA section 38(8) application. However, a Section 102 Amendment does require that an existing EMP required in terms of section 39 of the MPRDA must be revised. Such revision must be made commensurate with requirements stipulated in section 22(4) (a) of the MPRDA that require the applicant to conduct an EIA and submit an EMP for approval.

The EIA must therefore be conducted in accordance with section 38 of the MPRDA that give effect to the general objectives of integrated environmental management encapsulated in Chapter 5 of NEMA. The EIA must furthermore speak to impacts that the mining will have on the environment in accordance with section 24(7) of the NEMA.

The EIA consequently informs the EMP. Any subsequent revision of an EMP must then also consider and integrate possible management of environmental impacts on heritage resources.

4.1.2 NEMA

The NEMA stipulates under section 2(4)(a) that sustainable development requires the consideration of all relevant factors including (iii) the disturbance of landscapes and sites

that constitute the nation's cultural heritage must be avoided, or where it cannot be altogether avoided, is minimised and remedied.

Under section 23(2)(b) it is required to "identify, predict and evaluate the actual and potential impact on the...cultural heritage... the risks and consequences and alternatives and options for mitigation of activities, with a view to minimizing negative impacts, maximizing benefits and promoting compliance with the principles of environmental management set out in section 2".

Sections 24(1) (c) and 24(7) (b) state "the potential impact on...the cultural heritage of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing permitting, or otherwise allowing the implementation of an activity."

4.1.3 NHRA

The NID was completed in terms of section 38(8) of the NHRA where:

- Impacts on potential heritage resources must be assessed as part of the EIA required under sections 23(2)(b); 24(1)(c) and 24(7)(b) of the NEMA; and
- To give effect to the requirement that the consenting authority – in this case the DEA – consider any comments and recommendations of the relevant HRA prior to the granting of consent.

5 Methodology

A landscape approach was adopted employing both qualitative (text-based) and quantitative (field-based) methodologies. To provide the appropriate context for the interpretation of identified heritage resources, the connection between material culture, the cultural landscape and natural environment was required. In order to achieve this, several steps were undertaken and are outlined below.

5.1 Background Information

Background information was identified and reviewed (analysed) to obtain salient information summarised in this NID. Information sources that were consulted are summarised listed below and listed in section 9. It included text-based and cartographic sources, and database information.

5.1.1 Published Literature

Published literature including academic papers and Municipal IDP's that was found to be relevant included (full references are provided in Section 9)

- Breutz, 1938;
- Huffman, 2006;

- Lepekoane, 1994;
- Lephalale Local Municipality 2013;
- Lephalale Municipality 2013;
- Muncina and Rutherford, 2006;
- Plug, 2000;
- Van der Ryst, Lombard, Biemond and Master, 2004; and
- Waterberg District Municipality, 2013.

5.1.2 Reviewed Heritage Reports

Previously completed heritage studies were reviewed to expand on the background information discussed. The findings provide evidence-based inferences to be made with regard to the potential for, and description of heritage resources that are likely to occur in the project region. The following heritage cases and reports were found to be relevant:

- Du Piesanie, J., & Nel, J. (2012). Phase 2 Archaeological Impact Assessment Mitigation for the Boikarabelo Coal Mine (SAHRA PERMIT NO 80/11/07/015/51). Randburg: Digby Wells Environmental;
- Karodia and Higgitt, 2013. Heritage Impact Assessment For The Proposed Thabametsi Project, Lephalale, Limpopo Province;
- Nel, J. (2011). Phase 1 Archaeological Impact Assessment for the Proposed Temo Coal Mine, Lephalale Local Municipality, Waterberg District, Limpopo Province. Randburg: Digby Wells Environmental;
- Van der Walt, J. (2012). Archaeological Scoping Report for the proposed Sekoko Waterberg Colliery, Lephalale, Limpopo Province. Auckland Park: Heritage Contracts and Archaeological Consulting;
- Van Schalkwyk, 2005. Heritage Impact Scoping Report for the Proposed New Matimba B Power Station, Lephalale District, Limpopo Province; and
- Van der Walt, 2014. Archaeological Impact Assessment for the proposed Thabametsi Coal-Fired Power Station, Lephalale, Limpopo Province.

5.1.3 Databases

A review of relevant databases was completed to identify potential heritage resources within the Grootegeluk Project area. These included:

- Statistics South Africa (Stats SA);
- National Automated Archival Information Retrieval System (NAAIRS);
- The Genealogical Society of South Africa (GSSA);
- The University of the Witwatersrand Archaeological Site Database; and

- The South African Heritage Information System (SAHRIS).

5.1.4 Historical Layering

Historical layering is a process whereby diverse cartographic sources from various time periods are layered chronologically using GIS. The rationale behind historical layering is threefold, as it:

- Enables a virtual representation of changes in the land use of a particular area over time;
- Provides relative dates based on the presence/absence of visible features; and
- Identifies potential locations where heritage resources may exist within an area.

Historic cartographic sources reviewed in this report include:

- Major Jackson 1902 Zoutpan

Aerial photographs reviewed for the Grootegeluk Project are summarised in Table 5-1 below.

Table 5-1: Aerial imagery reviewed for the Grootegeluk Project

Aerial photographs						
Job no.	Flight plan	Photo no.	Map ref.	Area	Date	Reference
216	13	36694	2327	Krokodilrivier/Mokolo (Mogol)	1948	216/1948
	14	00967				
		00968 00970				
15	36751					
648	14	01012	2326 2327	Ellisras	1969	648/1969
	15	00973				
498/168	003	00025	2327	Ellisras	1981	498/168/1981
	004	00102 00110				
940	009	03077	2326 2327	Ellisras	1990	940/1990

5.2 Screening Assessment

A site screening survey was conducted on the 12th May 2014, by Natasha Higgitt. A walkthrough of impacted areas was completed while accompanied by an Exxaro Grootegeluk Health and Safety Officer. A GPS track log was kept of all areas visited (see Plan 4) and photographs were taken to record the general environment.

5.3 Site Naming

For the purpose of this report, site naming employed the following conventions:

- Sites identified in previous assessments were referred to by their respective report site names and prefixed with the relevant South African Heritage Resources Agency (SAHRA) Case ID or report reference number.

6 Discussion

6.1 Geology and Palaeontology

The geology of the project area consists of the Clarens Formation in the northern section with the Letaba Formation in the southern section of the project area. For the purpose of this report, only the Clarens Formation will be discussed as this falls within the project area.

The Clarens Formation consists of Aeolian desert sandstone, ephemeral stream deposits and basaltic lava flows (Lavin, 2013). Potential fossils associated with this formation include silicified wood and other plant remains, freshwater crustaceans, invertebrate trace fossils and other trace fossils, including dinosaur and mammal tracks. Other palaeontological remains may include the occurrence of rare dinosaurs such as *Massospondylus*, remains of *crocodylomorphs* and advanced *cynodonts*, including early mammals such as *Erythrotherium* (Lavin, 2013).

According to the SAHRIS PalaeoSensitivity map the project area falls within a high sensitivity zone (Council for GeoScience, 2014). However, the proposed project area has been impacted to such an extent that little, if any evidence of fossils remains. The development of the rail loop extension and service gate will not affect any bedrock nor will any blasting take place. In addition, the site screening survey also did not identify any geological outcrops that may provide better evidence of palaeontological potential in the project area, and as such there will also not be any impact on exposed potential fossil-bearing strata.

6.2 Soils, Climate and Vegetation

The project area falls within the Savannah Biome and falls within the Limpopo Sweet Bushveld sub-biome (Mucina & Rutherford, 2006: 474). This sub-biome is characterised by the presence of plains with short open woodland. Thickets of impenetrable *Acacia erubescens* (blue thorn) and *Dichrostachys cinera* (sicklebush) are present makes surveying

extremely difficult. During the site visit, grass cover and thickets of bushes and trees hampered visibility (see Figure 6-1). Open patches and animal burrows were examined for exposed artefacts, but did not provide any information.



Figure 6-1: Dense vegetation and grass cover within the project area

The sub-biome experiences a summer rainfall with extremely dry winters with an average rainfall of 350mm in the north-east and 500mm in the south-west. The soils of the biome include clayey-loamy soils on the plains and low lying areas and shallow, gravelly soils on the undulating area with patches of black clayey soils and Kalahari sand. Calcrete and surface limestone layers can also be found in the low-lying areas such as pans where *in situ* Stone Age lithics can be found (Mucina & Rutherford, 2006).

6.3 The Cultural Landscape

The Stone Age component of the cultural landscape is represented by the presence of Early Stone Age (ESA), Middle Stone Age (MSA) and Later Stone Age (LSA) sites scattered across the region. The majority of these sites are surface scatters with no *in situ* preservation (Van Schalkwyk, 2005: 7). There are a few examples of *in situ* preservation of Stone Age lithics in pans, where the lithics have been found in layers at the edge of dried-up pans (Nel, 2011; Van der Walt, 2012; Van der Walt, 2014). Furthermore, an engraving site occurs approximately 2.5 km from the proposed rail loop extension on a koppie known as 5091/Nelsonkop. The engravings include animal spoor, cupules and elongated grooves (Van der Walt, 2014). Similar engravings have been identified in Botswana, approximately 60 km north-west of the Nelsonkop site (Van der Ryst, Lombard, Biemond, & Master, 2004). Stone

Age lithics and undiagnostic ceramics were identified at Nelsonkop, while stone walling was found on top of the hill (Van der Walt, 2014).

Ceramic facies that occur within the wider region include the *Letsibogo* and *Madikwe* facies (du Piesanie & Nel, 2012 & Huffman, 2007). Most sites are ephemeral surface scatters of ceramic sherds (Karodia & Higgitt, 2013) with grain bin platforms (du Piesanie & Nel, 2012). Other instances of Iron Age heritage remains include cattle posts where cattle were kept in fenced compounds that were seasonally occupied (Breutz, 1938; Lepekoane, 1994 & du Piesanie & Nel, 2012).

As tsetse fly, causing sleeping sickness was still prevalent in the region as late as the 19th century (Plug, 2000). The Limpopo Valley was infested with Tsetse fly from 1836 – 1888 until the fly was eradicated (Fuller, 1923). This inhibited early white settlement as farmers could not herd cattle in the area. The historical record within the municipality therefore only really begins around 1900.

Ellisras was established in 1960 and named after the two original farm owners Patrick Ellis and Piet Erasmus who settled in the area in the 1930's (Lephalale Municipality, 2013). The town was later renamed to Lephalale in 2002 after the Phalala River that runs through the municipality.

A survey of historical aerial photographs, dated to between 1948 and 1969, indicated a rural, agricultural landscape with little surface disturbance (as seen in Figure 6-2 and Figure 6-3). This changes significantly from the late 1970s when the Grootegeluk Mine was developed. Aerial photographs dated to 1981 and 1990 indicate this significant change in landscape and land use (depicted in Figure 6-4 and Figure 6-5). By 1981 the current existing rail loop had already been established and most of the related mine infrastructure had been built. The continued expansion is evident in the 1990 photograph.

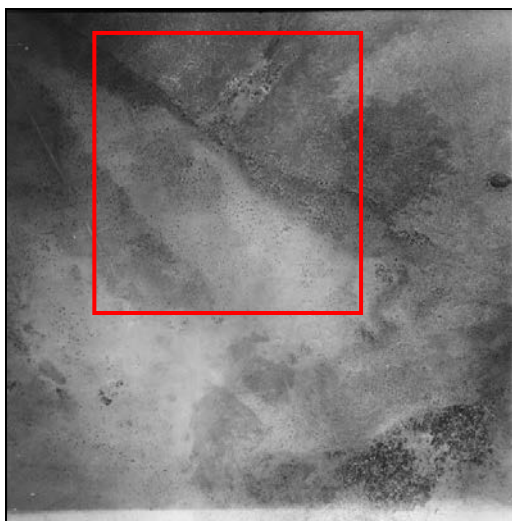


Figure 6-2: The Grootegeluk Expansion Project area in 1948

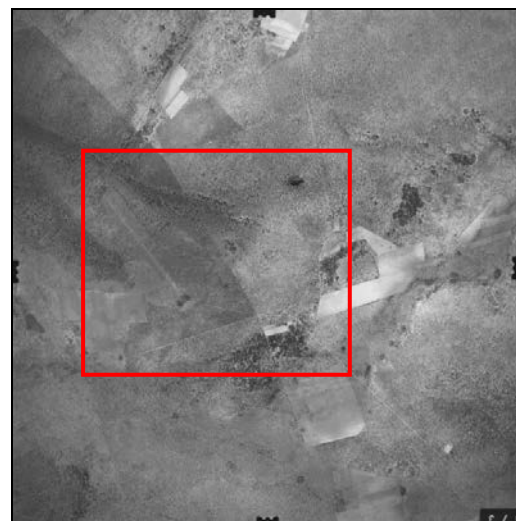


Figure 6-3: The Grootegeluk Expansion Project area in 1969



Figure 6-4: The Grootegeluk Expansion Project area in 1981



Figure 6-5: The Grootegeluk Expansion Project area in 1990

Mining access roads, power lines and the existing rail loop are currently present within the project area which has already impacted the project area (see Plan 3).

7 Sources of Risk

Sources of risk to sub-surface heritage resources were determined considering the Listed Activities for which Exxaro is applying for environmental authorisation (see Table 7-1). While the project area does not show signs of heritage resources and the risks are low, there may be unidentified sub-surface heritage resources that may be impacted on during the various phases of the project. A total of 95 % of the project area is located in current mining areas, while 5 % is located on undisturbed land. The sources of risk are therefore applied to the 5 %.

Table 7-1: Sources of Risk for the Grootegeluk Expansion Project

Identified Listed Activities	Description	Development as defined in NHRA	Trigger for HIA	Sources of risk to heritage resources	Project Phase
GN R544 22	<p>The construction of a road, outside urban areas, With a reserve wider than 13.5 m; or where no reserve exists where the road is wider than 8 m.</p> <p>The construction of the proposed road will be 20 m in width and 2 km in length.</p>	2 (viii) a, e & f	38 (1) a: The construction of a linear development exceeding 300 m	Potential damage or destruction to sub-surface heritage resources	■ Construction
GN R544 28	The expansion of or changes to existing facilities for any purpose or activity where such expansion or changes to will result in the need for a permit or licence in terms of national or provincial legislation governing the release of emissions or pollution.	2 (viii) a	38 (8): If an evaluation of impacts is required in terms of NEMA or MPRDA	Potential damage or destruction to sub-surface heritage resources	■ Construction
GN R544 53	“The expansion of railway lines, stations or shunting yards where there will be an increased development footprint...”	2 (viii) a, f	38 (8): If an evaluation of impacts is required in terms of NEMA or MPRDA	Potential damage or destruction to sub-surface heritage resources	■ Construction

7.1 Construction Phase

The highest likelihood of negative impacts on heritage resources to occur is associated with activities that will be undertaken during construction phase of the proposed projects. While the majority of the proposed project is located within current mining areas, the rail loop (2.5 km) and new parking lot/gate infrastructure (0.6 ha) are located in areas that have not been disturbed. Here, the potential to negatively impact sub-surface heritage resources, such as damage or destruction, is the greatest.

For the Grootegeluk Project, project activities identified as sources of risk during construction include:

- Ground clearance for the parking lot/gate infrastructure (0.6 ha); and
- Ground clearance and excavation for the rail extension (2.5 km).

Ground clearance and excavation for the construction of the rail loop and parking lot/gate infrastructure may disturb or damage any sub-surface heritage resources. However, excavations for the rail loop may uncover bedrock that may contain palaeontological resources. In this instance, they may be a positive impact as the excavation may identify unknown fossil heritage in the area.

7.2 Operational Phase

During the operation phase of the proposed project, sources of risk to heritage resources are limited. However, as identified in previous sections, the study area is predominantly associated with a mining landscape, thus negating the intensity of this risk to heritage resources.

7.3 Decommissioning Phase

No sources of risk to heritage resources are envisaged for the decommissioning phase of the project, unless any infrastructure at the time of decommission is protected in terms of section 34 of the NHRA.

7.4 Cumulative Impacts

No cumulative impacts on heritage resources are foreseen as a result of the Grootegeluk Expansion Project. A total of 95 % of the expansion and impact will occur within current mining areas. However, if any bedrock is affected, the following impact may occur:

- Exposure of palaeontological resources through excavations for construction and ground clearance could contribute to the understanding of the palaeontological record.

8 Conclusion and Recommendations

The Grootegeluk Expansion Project includes a rail loop extension, new access road, Bulk Material Handling section and new gate and associated parking lot. These areas are located within the Grootegeluk Mine operation area, which was established in 1981. While the surrounding areas contain heritage resources such as surface scatters of Stone Age and Iron Age heritage resources, no surface heritage resources were identified within the proposed expansion project area. The development context of the LLM is to drive the mining industry in the municipality. The proposed expansion project for the Grootegeluk mine will help to further the aim of the municipality and assist with the development of the District Municipality.

- As a result of the above, Digby Wells Heritage proposes a Letter of Exemption for further Heritage Studies be issued by SAHRA to exempt the Grootegeluk Expansion Project from all further heritage studies provided that the following is included in the EMP:
 - The EMP must include an integrated set of Chance Finds Procedures (CFP's) that must be implemented in the event that any significant archaeological and / or palaeontological material is exposed during the excavations for the rail loop; and
 - A Watching Brief is recommended for the ground clearance for the parking lot/gate infrastructure. A Watching Brief includes the presence of a qualified archaeologist on site during ground clearance to be on hand if any sub-surface heritage resources are uncovered and who will be able to make on-site recommendations.

9 References

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Notification of Intent to Develop

Heritage Component of the Environmental Impact Assessment for the Grootegeluk Expansion Project

EXX2768



DIGBY WELLS
ENVIRONMENTAL

Appendix A: Curriculum Vitae



DIGBY WELLS
ENVIRONMENTAL

NATASHA HIGGITT

Ms Natasha Higgitt
Assistant Heritage Consultant
Social Department
Digby Wells Environmental

1 EDUCATION

- University of Pretoria
- BA Degree (2008)
- Archaeology Honours (2010)
- Title of Dissertation- Pass the Salt: An Archaeological analysis of lithics and ceramics from Salt Pan Ledge, Soutpansberg, for evidence of salt working and interaction.

2 LANGUAGE SKILLS

- English - Excellent (read, write and speak)
- Afrikaans - Fair (read, write and speak)
- Italian – Poor (Speaking only)

3 EMPLOYMENT

- July 2011 to Present: Assistant Heritage Consultant at Digby Wells Environmental
- April 2011 to June 2011: Lab assistant at the Albany Museum Archaeology Department, Grahamstown, Eastern Cape
- April 2010 to March 2011: Intern at the Archaeology Department, Albany Museum, Grahamstown, Eastern Cape under the Department of Sports, Recreation, Arts and Culture, Eastern Cape Government, South Africa (DSRAC)

4 FIELD EXPERIENCE

- Human remains rescue excavation at St Francis Bay, Eastern Cape
- Human remains rescue excavation at Wolwefontein, Eastern Cape
- Recorded two rock art sites at Blaauwbosch Private Game Reserve, Eastern Cape



- Attended a 2 week excavation/study tour in the Friuli Region in Italy, organised by the *Società Friulana di Archeologia*, sponsored by *Ente Friuli nel Mondo*, and excavated a 12th century medieval castle
- Attended a 2 week excavation in Limpopo, Waterpoort Archaeological Project organised by Xander Antonites (Yale PhD Candidate)
- A total of 5 University of Pretoria Archaeology field schools in Limpopo and Gauteng spanning over 4 years

5 PROJECT EXPERIENCE

- Heritage Statement for a Proposed Acetylene Gas Production Facility, located near Witkopdorp, Daleside, south of Johannesburg, Gauteng Province for Erm Southern Africa (Pty) Ltd (Digby Wells Environmental)
- Heritage Impact Assessment for the Platreef Platinum Project, Mokopane, Limpopo for Platreef Resources (Digby Wells Environmental)
- Heritage Statement for ATCOM and Tweefontein Dragline Relocation Project, near Witbank, Mpumalanga Province for Jones and Wagner Consulting Civil Engineers (Digby Wells Environmental)
- Heritage Statement Report for the Wilgespruit Bridge Upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Heritage Statement Report for the Kosmosdal sewer pipe bridge upgrade, Pretoria, Gauteng Province for Iliso Consulting (Pty) Ltd (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Thabametsi Coal Mine, Lephalale, Limpopo for Exxaro Coal (Digby Wells Environmental)
- Heritage Statement for the Zandbaken Coal Mine Project, Zandbaken 585 IR, Sandbaken 363 IR and Bosmans Spruit 364 IS, Standerton, Mpumalanga for Xtrata Coal South Africa (Digby Wells Environmental)
- Phase 1 Heritage Impact Assessment for the Brakfontein Thermal Coal Mine, Mpumalanga for Universal Coal (Digby Wells Environmental)
- Development of a RAP for Aureus Mining for the New Liberty Gold Mine Project, Liberia (Digby Wells Environmental)
- Phase 1 Archaeological Impact Assessment for the MBET Pipeline, Steenbokpan, Limpopo (Digby Wells Environmental)
- Notice of Intent to Develop and Cultural Resources Pre-Assessment for Orlight SA (PTY) Ltd Solar PV Project. 2012. (Digby Wells Environmental)
- Agricultural Survey for Platreef ESIA, Mokopane, Limpopo. 2011. (Digby Wells Environmental)



- Cultural Resources Pre-Assessment for the Proposed Sylvania Everest North Mining Development in Mpumalanga, near Lydenburg. 2011. (Digby Wells Environmental)
- Phase 2 Mitigation of Archaeological sites at Boikarabelo Coal Mine, Steenbokpan, Limpopo. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for Proposed Platinum Mine Prospecting in Mpumalanga, near Bethal for Anglo Platinum. 2011. (Digby Wells Environmental)
- Cultural Resources Pre-Assessment for proposed Platinum Mine at Mokopane, Limpopo for Ivanhoe Platinum. 2011. (Digby Wells Environmental)
- Phase 1 AIA Mixed-use housing Development, Kwanobuhle, Extension 11, Uitenhage, Eastern Cape. 2011.
- Phase 1 AIA Centane to Qholora and Kei River mouth road upgrade survey, Mquma Municipality, Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Clidet Data Cable survey, Western Cape, Northern Cape, Free State and Eastern Cape. 2011. (SRK Consulting)
- Phase 1 AIA Karoo Renewable Energy Facility, Victoria West, Northern Cape. 2011. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Hamburg, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Windfarm survey in Molteno, Eastern Cape. 2010. (Savannah Environmental)
- Phase 1 AIA Housing Development at Motherwell, P.E. 2010. (SRK Consulting)
- Phase 1 AIA Sand quarry survey in Paterson, Eastern Cape. 2010. (SRK Consulting)
- Phase 1 AIA Quarry Survey at Victoria West. 2010. (Acer [Africa] Environmental Management Consultants)
- Phase 1 AIA Quarry Survey at Port Elizabeth. 2010. (E.P Brickfields)

6 PROFESSIONAL AFFILIATIONS

- Association of Southern African Professional Archaeologists (ASAPA): Professional member
- Association of Southern African Professional Archaeologists (ASAPA): CRM Practitioner (Field Supervisor: Stone Age, Iron Age and Rock Art)
- South African Museums Association (SAMA): Member

JOHAN NEL

Mr Johan Nel

Unit manager: Heritage Resources Management

Social Sciences

Digby Wells Environmental

1 EDUCATION

Date	Degree(s) or Diploma(s) obtained	Institution
2014	Integrated Heritage Resources Management Certificate, NQF Level 6	Rhodes University
2002	BA (Honours) (Archaeology)	University of Pretoria
2001	BA	University of Pretoria
1997	Matric with exemption	Brandwag Hoërskool

2 LANGUAGE SKILLS

Language	Speaking	Writing	Reading
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

3 EMPLOYMENT

Period	Company	Title/position
09/2011 to present	Digby Wells Environmental	Manager: Heritage Resources Management unit
05/2010-2011	Digby Wells Environmental	Archaeologist
10/2005-05/2010	Archaic Heritage Project Management	Manager and co-owner
2003-2007	Rock Art Mapping Project	Freelance archaeologist Resident archaeologist



2002-2003	Department of Anatomy, University of Pretoria	Special assistant: Anthropology
2001-2002	Department of Anatomy, University of Pretoria	Technical assistant
1999-2001	National Cultural History Museum & Department of Anthropology and Archaeology, UP	Assistant: Mapungubwe Project,

4 EXPERIENCE

Johan Nel has 13 years of combined experience in the field of cultural heritage resources management (HRM) including archaeological and heritage assessments, grave relocation, social consultation and mitigation of archaeological sites. I have gained experience both within urban settings and remote rural landscapes. Since 2010 I have been actively involved in environmental management that has allowed me to investigate and implement the integration of heritage resources management into environmental impact assessments (EIA). Many of the projects since have required compliance with International Finance Corporation (IFC) requirements and other World Bank standards. This exposure has allowed me to develop and implement a HRM approach that is founded on international best practice and leading international conservation bodies such as UNESCO and ICOMOS. I have worked in most South African Provinces, as well as Swaziland, the Democratic Republic of the Congo, Liberia and Sierra Leone. I am fluent in English and Afrikaans, with excellent writing and research skills.

5 PROFESSIONAL REGISTRATION

Position	Professional Body	Registration Number
Council member	Association for Southern African Professional Archaeologists (ASAPA); ASAPA Cultural Resources Management (CRM) section	095
Member	International Association of Impact Assessors (IAIA)	N/A
Member	International Council on Monuments and Sites (ICOMOS)	
Member	Society for Africanist Archaeologists (SAfA)	N/A

6 PUBLICATIONS AND CONFERENCE PAPERS

Authors and Year	Title	Published in/presented at
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Nel, J. (2001)	Cycles of Initiation in Traditional South African Cultures.	South African Encyclopaedia (MWEB).
Nel, J. 2001..	Social Consultation: Networking Human Remains and a Social Consultation Case Study	Research poster presentations at the. Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists the National Museum, Cape Town
Nel, J. 2002.	Collections policy for the WG de Haas Anatomy museum and associated Collections.	Unpublished. Department of Anatomy, School of Medicine: University of Pretoria.
Nel, J. 2004..	Research and design of exhibition for Eloff Belting and Equipment CC	Institute of Quarrying 35th Conference and Exhibition on 24 – 27 March 2004
Nel, J. 2004.	Ritual and Symbolism in Archaeology, Does it exist?	Research paper presented at the Bi-annual Conference (SA3) Association of Southern African Professional Archaeologists: Kimberley
Nel, J & Tiley, S. 2004.	The Archaeology of Mapungubwe: a World Heritage Site in the Central Limpopo Valley, Republic of South Africa.	Archaeology World Report, (1) United Kingdom p.14-22.
Nel, J. 2007.	The Railway Code: Gautrain, NZASM and Heritage.	Public lecture for the South African Archaeological Society, Transvaal Branch: Roedean School, Parktown.
Nel, J. 2009.	Un-archaeologically speaking: the use, abuse and misuse of archaeology in popular culture.	The Digging Stick. April 2009. 26(1): 11-13: Johannesburg: The South African Archaeological Society.
Nel, J. 2011.	'Gods, Graves and Scholars' returning Mapungubwe human remains to their resting place.' In: Mapungubwe Remembered.	University of Pretoria commemorative publication: Johannesburg: Chris van Rensburg Publishers.
Nel, J. 2012	HIAs for EAPs.	. Paper presented at IAIA annual conference: Somerset West.



Nel, J. 2013.	The Matrix: A proposed method to evaluate significance of, and change to, heritage resources.	Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.
Nel, J. 2013	HRM and EMS: Uncomfortable fit or separate process.	. Paper presented at the 2013 ASAPA Biennial conference: Gaborone, Botswana.

7 PROJECT EXPERIENCE

- 2003-2004. Freelance consulting archaeologist. Archaeological Impact Assessment. Roodt&Roodt. RSA. Limpopo, Mpumalanga, Northwest. Project manager/specialist
- 2004-2005. Resident archaeologist Rock Art Mapping Project. Archaeological surveys. UKZN. RSA. Didima, KZN. Specialist
- 2006. Exploratory excavation of an unknown cemetery at Du Preezhoek, Fountains Valley, Portion 383 of the farm Elandsport 357 JR, Pretoria, Gauteng. Section 36 Grave relocation. Bombela Civil Joint Venture. RSA. Pretoria, Gauteng. Specialist
- 2006. Report on exhumation, relocation and re-internment of 49 graves on Portion 10 of the farm Tygervallei 334 JR, Kungwini Municipality, Gauteng. Section 36 Grave relocation. D. Georgiades East Farm (Pty) Ltd. RSA. Kungwini, Gauteng. Specialist
- 2006. Social consultation for Elawini Lifestyle Estate Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Nelspruit, Mpumalanga. Project manager/specialist
- 2007-2008. Research report on the remains of kings Mampuru I and Nyabela. Research report. National Department of Arts and Culture. RSA. Graafwater, Western Cape. Specialist
- 2007. Summary report: Old dump on premises of the new Head Offices, Department of Foreign Affairs, Pretoria, Gauteng. Archaeological Impact Assessment. Imbumba-Aganang D & C Joint Venture. RSA. Pretoria, Gauteng. Project manager/specialist
- 2007. Final consolidated Heritage Impact Assessment report: Proposed development of high-cost housing and filling station, Portion of the farm Mooiplaats 147 JT. Heritage Impact Assessment. Go-Enviroscience. RSA. Schoemanskloof, Mpumalanga. Project manager/specialist
- 2007. Final consolidated report: Watching Brief on Soutpansberg Road Site for the new Head Offices of the Department of Foreign Affairs, Pretoria Gauteng. Section 35 Phase 2 Archaeological Mitigation. Imbumba-Aganang D & C Joint Venture. RSA. Pretoria, Gauteng. Project manager/specialist
- 2007. Recommendation of Exemption: Above ground SASOL fuel storage tanks located at grain silos in localities in the Eastern Free State. Request for Exemption. SASOL (Pty) Ltd. RSA. Eastern Free State. Project manager/specialist



- 2007. Final consolidated report: Phase 2 test excavations ascertaining the existence of alleged mass graves, Tlhabane West, Extension 2, Rustenburg, Northwest Province. Section 36 Test excavations. Bigen Africa Consulting Engineers. RSA. Rustenburg, Northwest. Project manager/specialist
- 2007. Archaeological investigation of Old Johannesburg Fort. Section 35 Phase 2 Archaeological Mitigation. JDA. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2007. Social consultation for Motaganeng Residential Development Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Burgersfort, Limpopo. Project manager/specialist
- 2007. Repatriation of Mapungubwe Human Remains. Repatriation. DEAT. RSA. Mapungubwe, Limpopo. Project manager/specialist
- 2007. Research report on cultural symbols. Research report. Ministry of Intelligence Services. RSA. Graafwater, Western Cape. Project manager/specialist
- 2008. Phase 1 Heritage and Archaeological Impact Assessment: Proposed establishment of an access road between Sapekoe Drive and Koedoe Street, Erf 3366 (Extension 22) and the Remainder of Erf 430 (Extension 4). Archaeological Impact Assessment. AGES (Polokwane). RSA. Tzaneen, Limpopo. Specialist
- 2008. Heritage Impact Assessment for proposed water pipeline routes, Mogalakwena District, Limpopo Province. Heritage Statement. AGES (Polokwane). RSA. Mogalakwena District Municipality, Limpopo. Specialist
- 2008. Final report: Heritage resources Scoping survey and preliminary assessment for the Transnet Freight Line EIA, Eastern Cape and Northern Cape. Heritage Statement. Transnet. RSA. Eastern Cape; Northern Cape. Specialist
- 2008. Heritage resources scoping survey and preliminary assessment: Proposed establishment of township on Portion 28 of the farm Kennedy's Vale 362 KT, Steelpoort, Limpopo Province. Heritage Statement. AGES (Polokwane). RSA. Steelpoort, Limpopo. Specialist
- 2008. Report on skeletal material found at Pier 30, R21 Jones Street offramp, Kempton Park. Heritage Statement. Bombela Civil Joint Venture. RSA. Kempton Park, Gauteng. Specialist
- 2008. Social consultation for Smoky Hills Platinum Mine Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Maandagshoek, Limpopo. Specialist
- 2008. Southstock Collieries Grave Relocation. Section 36 Grave relocation. Doves Funerals, Witbank. RSA. Southstock, Mpumalanga. Specialist
- 2008. Social consultation for Zondagskraal Coal Mine Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Zondagskraal, Mpumalanga. Specialist



- 2009. Proposed road upgrade of existing, and construction of newroads in Burgersfort, Limpopo Province. Archaeological Impact Assessment. AGES (Polokwane). RSA. Burgersfort, Limpopo. Specialist
- 2009. Randwater Vlakfontein-Mamelodi water pipeline survey. Heritage Impact Assessment. Archaeology Africa cc. RSA. Pretoria, Gauteng. Specialist
- 2009. Van Reenen Eco-Agri Development Project. Heritage Impact Assessment. Go-Enviroscience. RSA. Vanreenen, Freestate/KwaZulu-Natal. Specialist
- 2009. Social consultation for Zonkezizwe Grave Relocation. Section 36 Consultation. PGS (Pty) Ltd. RSA. Midrand, Gauteng. Specialist
- 2009. Heritage Impact Assessment for conversion of PR to MRA. Heritage Impact Assessment. Georock Environmental. RSA. Musina, Limpopo. Specialist
- 2010-2012. Kibali Gold Mine Grave Relocation. International grave relocation project. Randgold Resources. DRC. Watsa, Province Orientale. Specialist
- 2010. Archaeological Impact Assessment for Galaxy Gold Mine Tailings Dam Extension, Barberton, Mpumalanga Province. Archaeological Impact Assessment. Galaxy Gold. RSA. Barberton, Mpumalanga. Specialist
- 2010. Archaeological Impact Assessment for the HCI Khusela Coal: Palesa Extension ESIA Update on portions of the farm Roodepoort 349 JR, Thembisile Local Municipality (Mpumalanga) and Kungwini Municipality (Gauteng). Archaeological Impact Assessment. HCI Khusela. RSA. Mpumalanga; Gauteng. Specialist
- 2010. Heritage scoping survey for the amendment of the existing City Deep EMP for the reclamation of Slimes Dam 3/L/42 and 3/L/40. Heritage Statement. Crown Gold Recoveries. RSA. Johannesburg, Gauteng. Specialist
- 2010. Letter of Recommendation of Exemption for the proposed Crown Gold Recoveries (Pty) Ltd Pipeline Project. Request for Exemption. Crown Gold Recoveries. RSA. Johannesburg, Gauteng. Specialist
- 2010. Mitigation of an archaeological metalworking site for Kibali Gold Mine. Archaeological mitigation. Randgold Resources. DRC. Watsa, Province Orientale. Specialist
- 2010. Heritage Impact Assessment for Nzoro Hydropower Station. Heritage Impact Assessment. Randgold Resources. DRC. Watsa, Province Orientale. Specialist
- 2010. Heritage Impact Assessment for Temo Coal EIA. Heritage Impact Assessment. Temo Coal. RSA. Steenbokpan, Limpopo. Specialist
- 2011-2012. Platreef Platinum Mine Burial Grounds and Graves Census. Burial Grounds and Graves Census. Platreef (Pty) Ltd. RSA. Mokopane, Limpopo. Project manager/specialist
- 2011. Addendum to Phase 1 Archaeological Impact Assessment for the Boikarabelo Coal Mine (proposed railway link from the farm Kruishout to the farm Buffelsjagt). Archaeological Impact Assessment. Resources Generation. RSA. Lephalale, Limpopo. Project manager/specialist



- 2011. Heritage Impact Assessment for Koidu Diamond Mine. Heritage Impact Assessment. Koidu . Sierra Leone. Koidu, . Project manager/specialist
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- 2011. Nzoro hydropower station ESIA. Heritage Impact Assessment. Randgold Resources. DRC. Watsa, Province Orientale. Project manager/specialist
- 2011. Specialist review of Heritage Impact Assessment report for Zod Gold Mine, Armenia. Review report. Zod Gold Mine. Armenia. Desktop review. Project manager/specialist
- 2012. Phase 1 Archaeological Impact Assessment for MBET Pipeline. Archaeological Impact Assessment. Resources Generation. RSA. Lephalale, Limpopo. Project manager/specialist
- 2012. Heritage Impact Assessment for the Witwatersrand Goldfields Acid Mine Drainage Project (Western Basin). Heritage Impact Assessment. BKS (PTY) LTD. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2012. Phase 1 Heritage Impact Assessment of the proposed Geluksdal Tailings Storage Facility and Pipeline Infrastructure. Heritage Impact Assessment. Gold One. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2012. Heritage Statement for the Central Basin, Witwatersrand AMD Project. Heritage Statement. BKS (PTY) LTD. RSA. Johannesburg, Gauteng. Project manager/specialist
- 2012. Heritage Statement for Rhodium Reefs Ltd Platinum Operation, 2430CA & CC, De Goedeverwaching 332 KT; Boschkloof 331 KT; Belvedere 362 KT; Kennedy's Vale 361 KT; and Tweefontein 360 KT, Limpopo. Heritage Statement. Eastplats Group. RSA. Steelpoort, Limpopo. Project manager/specialist
- 2012. Notification of Intent to Develop: Proposed Aggeneys Photo-voltaic solar power plant on Portion 1 of the farm Aroams 57 RD, Northern Cape (DEA ref: 12/12/20/2630). Heritage Statement. Orlight Solar. RSA. Aggeneys, Northern Cape. Specialist
- 2012. Notification of Intent to Develop: Proposed Kenhardt Photo-voltaic solar power plant on RE of the farm Klein Zwartbast 188 RD, Northern Cape (DEA ref: 12/12/20/2631). Heritage Statement. Orlight Solar. RSA. Kenhardt, Northern Cape. Project manager/specialist
- 2012. Notification of Intent to Develop: Proposed Loeriesfontein Photo-voltaic solar power plant on Portion 1 of the farm Klein Rooiberg 227 RD, Northern Cape (DEA ref: 12/12/20/2632). Heritage Statement. Orlight Solar. RSA. Loeriesfontein, Northern Cape. Specialist
- 2012. Notification of Intent to Develop: Proposed Vanrhynsdorp Photo-voltaic solar power plant on RE of the farm Paddock 257 RD, Western Cape (DEA ref: 12/12/20/2633). Heritage Statement. Orlight Solar. RSA. Vanrhynsdorp, Western Cape. Project manager/specialist
- 2012. Notification of Intent to Develop: Proposed Graafwater Photo-voltaic solar power plant on Portion 1 of the farm Graafwater 97 RD and RE of Bueroskraal 220 RD, Western Cape



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- 2012. Phase 2 archaeological impact assessment mitigation for Boikarabelo Coal Mine (SAHRA Permit No: 80/11/07/015/51). . Section 35 Phase 2 Archaeological Mitigation. Resources Generation. RSA. Steenbokpan, Limpopo. Project manager/specialist
- 2012. Final Phase 2 archaeological impact assessment mitigation report for Boikarabelo Coal Mine, Limpopo (SAHRA Permit No: 80/11/07/015/51). . Section 35 Phase 2 Archaeological Mitigation. Resources Generation. RSA. Steenbokpan, Limpopo. Specialist
- 2012. Holder of Destruction Permit No. 84 for archaeological sites at Boikarabelo Coal Mine. Section 35 Destruction permit. Resources Generation. RSA. Steenbokpan, Limpopo. Project manager/specialist
- 2012. Specialist review of Heritage Impact Assessment report for Mkuju Uranium Mine. Review report. Uranex . Zambia. Desktop review. Project manager/specialist
- 2013. Heritage Impact Assessment for the proposed Consbrey Colliery Project, 2629BB and 2629BD, Mpumalanga Province. Heritage Impact Assessment. Msobo Coal. RSA. Breyten, Mpumalanga. Project manager/specialist
- 2013. Heritage Impact Assessment for Rhodium Reef Limited Platinum Operation, 2430CC Kennedys Vale, De Goedevoering 332 KT, Limpopo Province. Heritage Impact Assessment. Rhodium Reefs Limited. RSA. Steelpoort, Limpopo. Project manager/specialist
- 2013. Heritage Statement for the Consbrey Colliery. Heritage Statement. Msobo Coal. RSA. Chrissiesmeer, Mpumalanga. Project manager/specialist
- 2013. Heritage Statement for the Harwar Colliery. Heritage Statement. Msobo Coal. RSA. Chrissiesmeer, Mpumalanga. Project manager/specialist
- 2013. Heritage Statement for the Waterberg Prospecting Rights Application, Blouberg, Limpopo Province. Heritage Statement. Platinum Group Metals Ltd. RSA. Breyten, Mpumalanga. Specialist
- 2013. Destruction Permit Application Report for Kangala Coal Project. Section 34 Built Environment Permit. Universal Coal (Pty) Ltd. RSA. Delmas, Mpumalanga. Specialist
- 2013. Holder of Destruction Permit No. 399 for archaeological sites at Boikarabelo Coal Mine. Section 35 Destruction permit. Resources Generation. RSA. Steenbokpan, Limpopo. Project manager/specialist
- 2013. Relocation of graves in Kinjor and Larjor for Aureus New Liberty Gold Mine. International grave relocation project. Aureus Mining. Liberia. Kinjor. Specialist
- 2013. New Liberty Gold Mine Grave Relocation Plan. International grave relocation project. Aureus Mining. Liberia. Kinjor. Project manager/specialist
- 2013. Thabametsi Coal Mine Burial Grounds and Graves Census. Burial Grounds and Graves Census. Exxaro Coal. RSA. Lephalale, Limpopo. Specialist



- 2013. Bokoni Platinum Mine Burial Grounds and Graves Census. Burial Grounds and Graves Census. Bokoni Platinum. RSA. Atok, Limpopo. Specialist
- 2013. Specialist review of Heritage Impacts Assessment for Songwe REE project. Review report. Mkango Resources. Malawi. Desktop review. Project manager/specialist
- 2013: Heritage Impact Assessment for the Platreef Platinum Mine EIA project. Platreef Resources. RSA. Mokopane, Limpopo. Specialist project manager.

Notification of Intent to Develop

Heritage Component of the Environmental Impact Assessment for the Grootegeluk Expansion Project

EXX2768



DIGBY WELLS
ENVIRONMENTAL



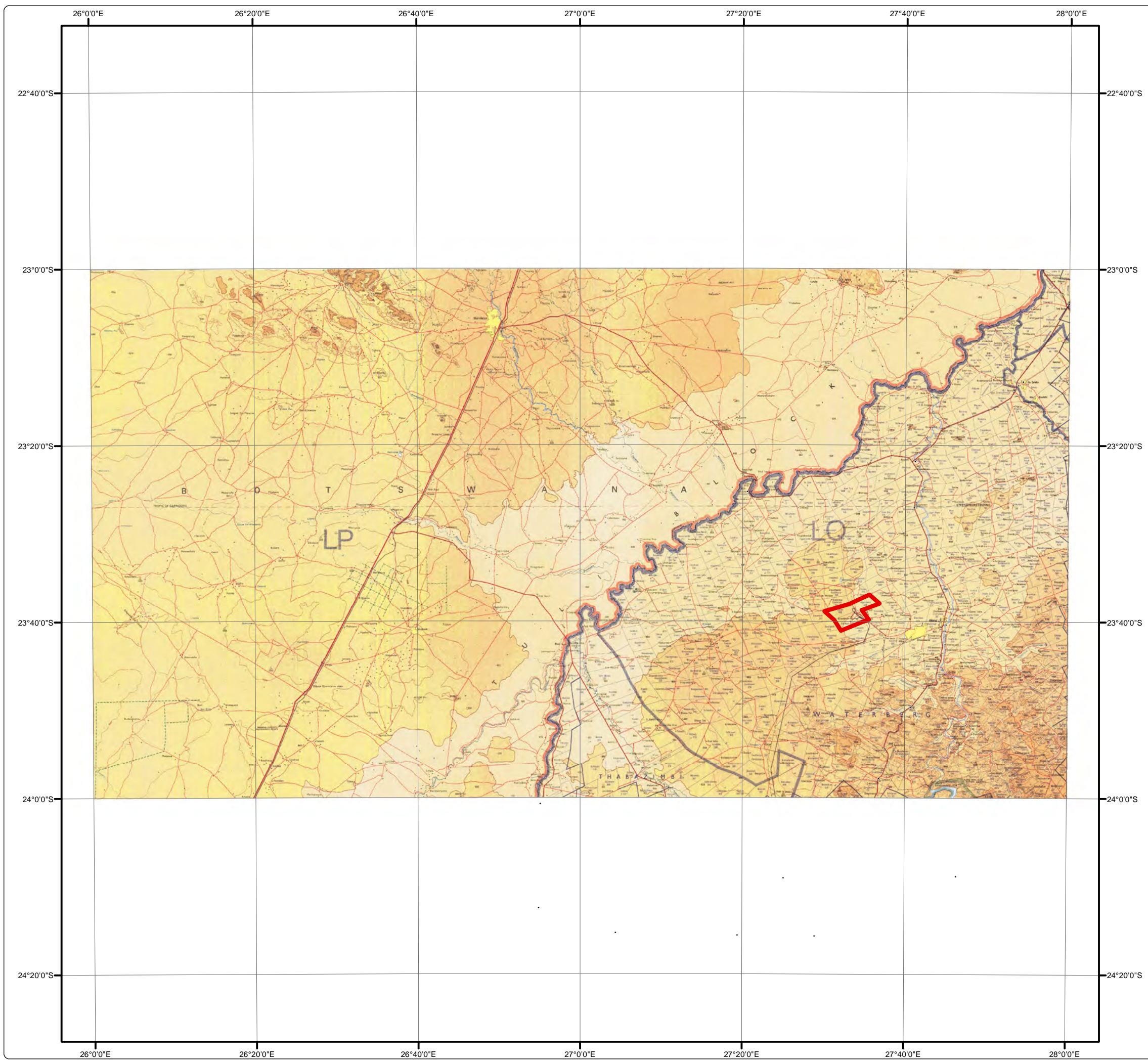
Appendix B: Location and Site Maps

Exxaro Grootegeluk Rail Loop Extension

Regional Setting
1: 250 000 Topo-Cadastral

Legend

 Project Area

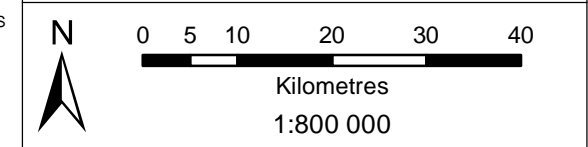


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2326 Lephalale



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

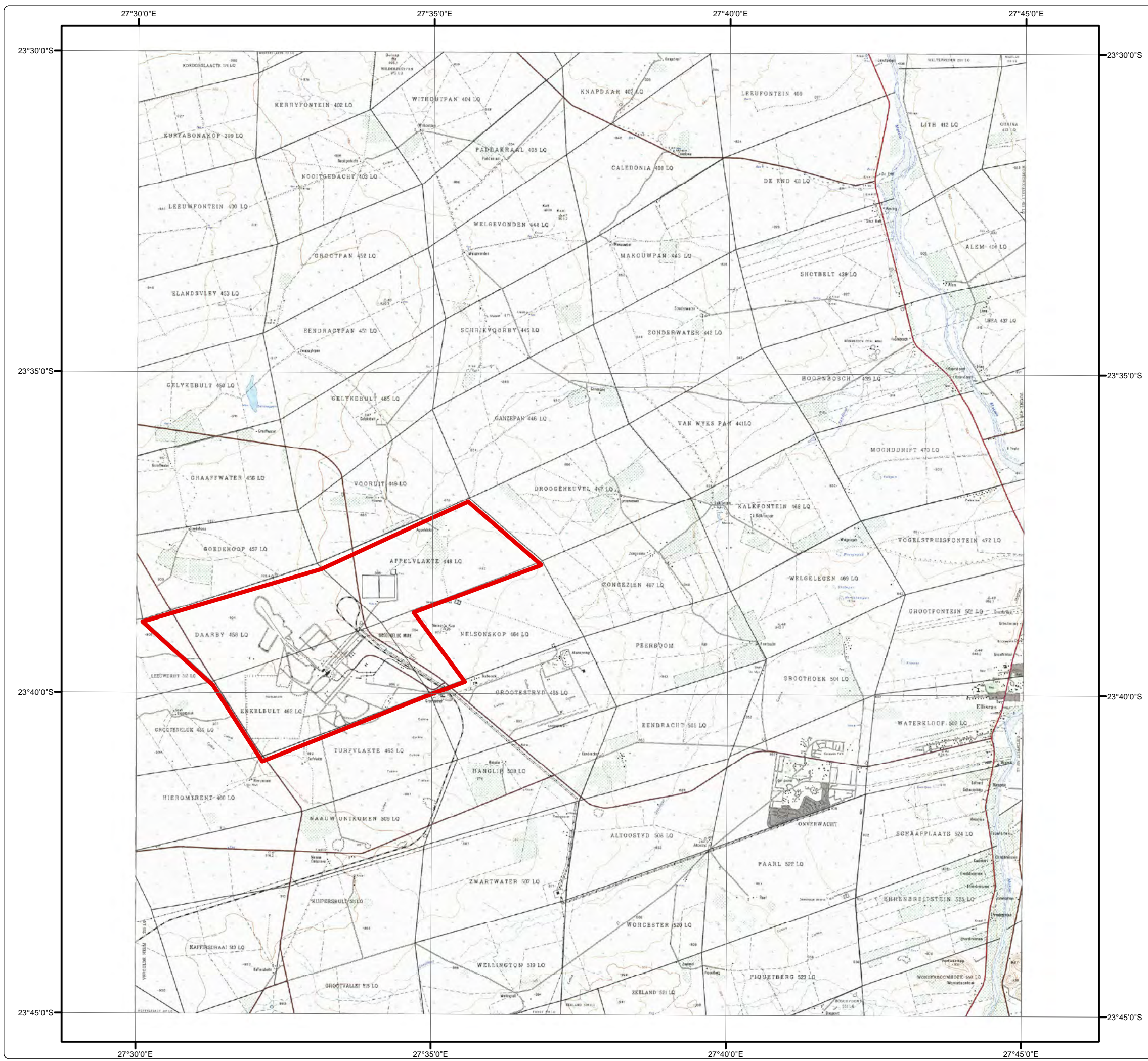
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Datum: Cape Revision Number: 1
Central Meridian: 27°E Date: 23/06/2014



Exxaro Grootegeluk Rail Loop Extension

Local Setting
1: 50 000 Topo-Cadastral

Legend

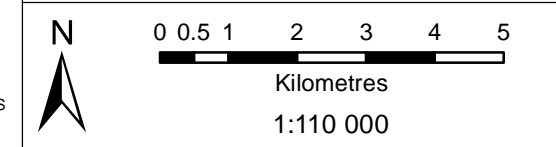


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2327DA Lephale



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: anp.EXX2678.201406.120
Datum: Cape Revision Number: 1
Central Meridian: 27°E Date: 23/06/2014



Exxaro Grootegeluk Rail Loop Extension

Proposed Infrastructure

Legend

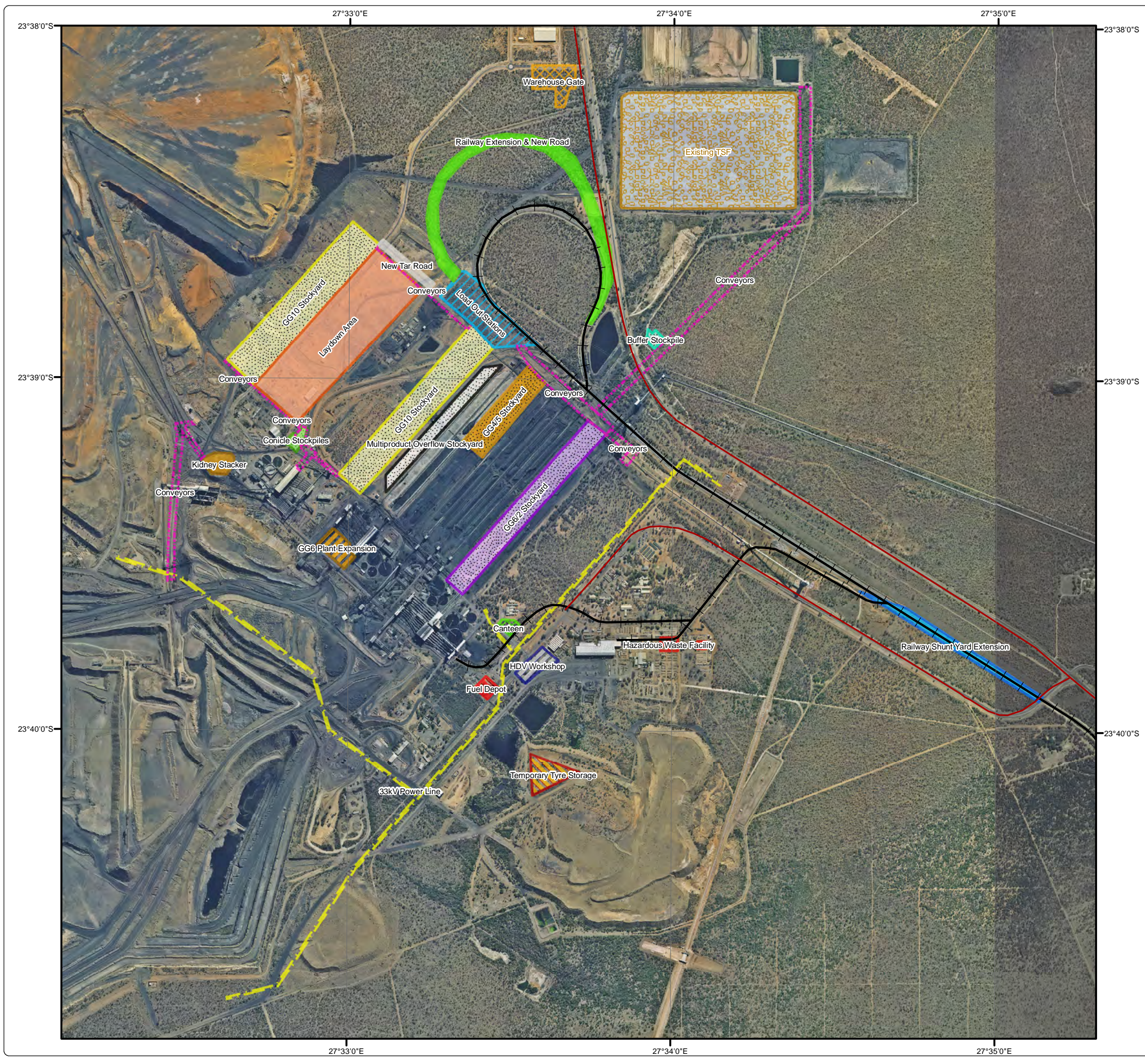
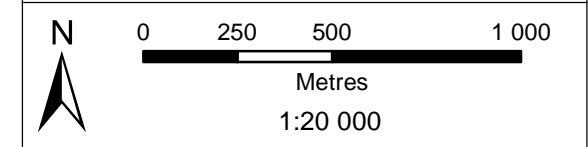
- Main / Secondary Road
- Existing Railway Line
- Existing TSF
- Proposed Infrastructure**
- GG6 Plant Expansion
- GG9 Plant Expansion
- GG4/5 Stockyard
- GG6/2 Stockyard
- GG10 Stockyard
- Multiproduct Overflow Stockyard
- Conicle Stockpiles
- Buffer Stockpile
- Fuel Depot
- Kidney Stacker
- Laydown Area
- New Tar Road
- Railway Extension & New Road
- Railway Shunt Yard Extension
- Load Out Stations
- Warehouse Gate
- HDV Workshop
- Hazardous Waste Facility
- Canteen
- Temporary Tyre Storage
- 33kV Power Line
- Conveyors



DIGBY WELLS
ENVIRONMENTAL

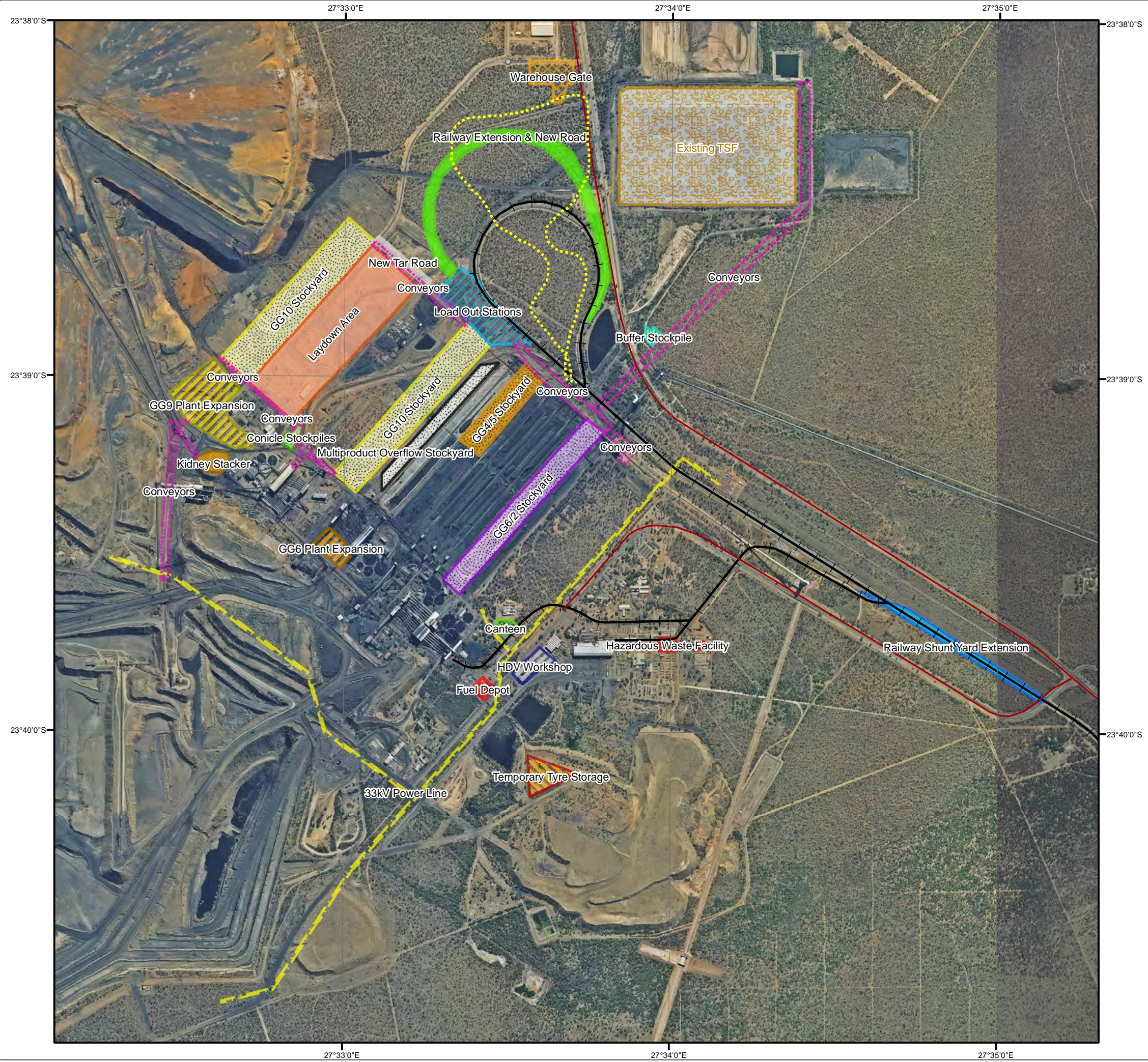
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Projection: Transverse Mercator Ref #: anp.EXX2678.201405.070
Datum: Cape Revision Number: 1
Central Meridian: 27°E Date: 07/07/2014



Exxaro Grootegeluk Rail Loop Extension

GPS Track Log



Legend

- GPS Track Log
- Main / Secondary Road
- Existing Railway Line
- Existing TSF
- Proposed Infrastructure**
- GG6 Plant Expansion
- GG9 Plant Expansion
- GG4/5 Stockyard
- GG6/2 Stockyard
- GG10 Stockyard
- Multiproduct Overflow Stockyard
- Conicle Stockpiles
- Buffer Stockpile
- Fuel Depot
- Kidney Stacker
- Laydown Area
- New Tar Road
- Railway Extension & New Road
- Railway Shunt Yard Extension
- Load Out Stations
- Warehouse Gate
- HDV Workshop
- Hazardous Waste Facility
- Canteen
- Temporary Tyre Storage
- 33kV Power Line
- Conveyors



• Sustainability • Service • Positive Change • Professionalism • Future Focused • Integrity

Projection: Transverse Mercator Ref #: anp.EXX2678.201406.121
 Datum: Cape Revision Number: 1
 Central Meridian: 27°E Date: 23/06/2014

