ANGLO OPERATIONS (PTY) LTD: LESLIE 2

EIAR AND EMPR

FOR PUBLIC REVIEW

DMR REF. NUMBER: GP 30/5/1/2/2(10045) MR / GP 30/5/1/2/3/2/1 (10045) EM

February 2017

SHANGONI
Management Services (Pty) Ltd

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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: ANGLO OPERATIONS (PTY) LTD
PROJECT: LESLIE 2
DOCUMENT: EIAR AND EMPR FOR PUBLIC REVIEW
TEL NO: +27 (0)11 638 4608
FAX NO: +27 (0)11 638 4608
POSTAL ADDRESS: Private Bag X1; Marshalltown; Johannesburg; 2107
PHYSICAL ADDRESS: 55 Marshall Street; Johannesburg
DMR FILE REF. NUMBER: GP 30/5/1/2/2(10045) MR / GP 30/5/1/2/3/2/1 (10045) EM

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 a 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 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process—

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
(b) describe 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 the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
(d) determine the—-
    (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    (ii) degree to which these impacts—
        (aa) can be reversed;
        (bb) may cause irreplaceable loss of resources, and
        (cc) can be avoided, managed or mitigated;
(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
(g) identify suitable measures to manage, avoid or mitigate identified impacts; and
(h) identify residual risks that need to be managed and monitored.

TABLE OF CONTENTS

ANNEXURES

Annexure A: **Figures**

Annexure B: **Project team CV's and EAP Declaration**

Annexure C: **Correspondence with Government Departments**

Annexure C1: Original Application form
Annexure C2: Application Form Acknowledgement letter from DMR
Annexure C3: Minutes of DMR pre-application meeting
Annexure C4: Scoping Report Acceptance Letter from DMR
Annexure C5: Scoping Amended Application form and EIA listed activities reference page
Annexure C6: Extension Request Letter to DMR
Annexure C7: Extension Request Response Letter from DMR

Annexure D: **Prospecting Rights and Renewals**

Annexure E: **Mining Works Programme**

Annexure F: **Alternatives Assessment Report**

Annexure G: **Public Participation Report(s)**

Annexure H: **Specialist studies**

Annexure H1: Soil, Land use and Land Capability Assessment
Annexure H2: Terrestrial Flora and Fauna Assessment
Annexure H3: Storm Water Management Plan
Annexure H4: Wetland and Aquatic Assessment
Annexure H5: Geohydrological Assessment and Waste Classification and Characterisation
Geotechnical Investigation in support of Waste Characterisation
Annexure H6: Air Quality Impact Assessment
Annexure H7: Environmental Noise Impact Assessment
Annexure H8: Blasting and Vibration Assessment
Annexure H9: Visual Impact Assessment
Annexure H10: Traffic Impact Assessment
Annexure H11: Phase 1 Archaeological (Heritage) Impact Assessment
Annexure H12: Phase 1 Palaeontological Impact Assessment
Annexure H13: Socio-Economic Assessment
Annexure H14: Land Trade-Off and Macro Economic Assessment

Annexure I: **Social and Labour Plan**

Annexure J: **Risk Assessment Report**

Annexure K: **Financial Provision, Rehabilitation, Decommissioning- and Closure Plan**

REFERENCES

AGIS - Comprehensive Atlas, Agricultural Geo-Referenced Information System, www.agis.agric.za/agisweb/agis.html.

Anglo Operations Limited. 2016. Leslie 2 Mining Works Programme.

Anglo Operations Limited. 2016. Leslie 2 Social and Labour Plan.

Anglo Operations Limited. 2005. Leslie 2 Prospecting Environmental Management Plan (EMP).

Blast Management and Consulting. 2016. Blast Impact Assessment. Leslie 2 Mining Operations.

BM Geological Services. 2016. Phase 1 Palaeontological Heritage Impact Assessment report on the site of a mining right application on an area known as the Leslie 2 project, Gauteng Province

Department of Environmental Affairs. Integrated Environmental Management Guideline Series 9. Guideline on need and desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010. GN 891 of 2014.

Department of Environmental Affairs. National Environmental Management Act, 1998 (Act 107 of 1998). GNR.982 Environmental Impact Assessment (EIA) Regulations, dated December 2014.

Department of Environmental Affairs. National Environmental Management Act, 1998 (Act 107 of 1998). GNR.983 Environmental Impact Assessment (EIA) Regulations, dated December 2014.

Department of Environmental Affairs. National Environmental Management Act, 1998 (Act 107 of 1998). GNR.984 Environmental Impact Assessment (EIA) Regulations, dated December 2014.

Department of Environmental Affairs. Integrated Environmental Management Information Series. Criteria for determining alternatives in EIA.

Department of Mineral Resources. Guideline for Consultation with communities and Interested and Affected Parties.

Gauteng Department of Agriculture and Rural Development (GDARD). Gauteng Provincial Environmental Management Framework (EMF), dated November 2014

Shangoni Management Services (Pty) Ltd.

Gauteng Department of Agriculture and Rural Development (GDARD). Gauteng Spatial Development Framework (SDF); dated July 2011

Gauteng Department of Agriculture and Rural Development (GDARD). Gauteng Conservation Plan, Version 3.3

KHg Applied Geologists. 2017. Preliminary Report. Phase 1 Engineering Geological Investigation: Portion 22 Winterhoek 314 IR Mpumalanga.

Lesedi Local Municipality. Draft Integrated Development Plan (IDP), 2016/17

Mosaka Economic Consultants trading as Conningarth Economists. 2017. Anglo Operations (Pty) Ltd: Proposed Leslie 2 Project. Land trade-off study and macro-economic impact analysis for the proposed Leslie 2 Project located near Devon and Leandra in the Sedibeng District Municipality.

Mucina & Rutherford. 2006. The vegetation of South Africa, Lesotho and Swaziland.

Nemai Consulting. 2016. Anglo Operations (Pty) Ltd: Leslie 2 – Application for a mining right, environmental authorisation and waste management licence. Socio-economic Impact Assessment

Pistorius. J. 2016. A phase I heritage impact assessment (HIA) study for Anglo Operations (Pty) Ltd's proposed Leslie 2 Project (near Leandra) in Gauteng Province

SANBI – South African National Biodiversity Institute.

Scientific Aquatic Services. 2017. Soil, land use and land capability assessment for the proposed Leslie 2 underground coal mining operation, within the Gauteng Province

Scientific Aquatic Services. 2016. Aquatic and wetland assessment as part of the environmental assessment and authorisation process for the Leslie 2 underground coal mining operation, Gauteng Province.

Scientific Terrestrial Services. 2017. Faunal and Floral Ecological Assessment as part of the Environmental Assessment and Authorisation process for the proposed Leslie 2 Underground Coal Mining operation, Gauteng Province.

Scientific Terrestrial Services. 206. Visual impact assessment as part of the Environmental Assessment and authorisation process for the proposed Leslie 2 mining project, Gauteng Province.

Shangoni Management Services (Pty) Ltd.

Sedibeng District Municipality Integrated Development Plan (IDP), 2016-17

Sedibeng District Municipality Draft Spatial Development Framework (SDF), 2014 – 2017

Shangoni AquiScience. December 2016. Geohydrological EIA in support of a mining right application, environmental authorisation, and waste management licence for the Leslie 2 Project.

Shangoni Management Services. 2016. Anglo Operations (Pty) Ltd: Leslie 2 – Hydrological Assessment.

Shangoni Management Services. 2017. Anglo Operations (Pty) Ltd: Leslie 2 – Air quality impact assessment.

Varicon cc. 2016. Anglo Operations (Pty) Ltd. Leslie 2 Underground Coal Mine. Environmental noise impact assessment report.

WSP. 2016. Traffic Impact Assessment. Environmental impact evaluation of the proposed Leslie 2 mining operation located on Palmietfontein 316 IR and Winterhoek 314 IR near Leandra, Gauteng

PART A

SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1. Details and expertise of the EAP

1.1 Details of the EAP

Name of The Practitioner: Shangoni Management Services: Wilda Meyer
Tel No.: (012) 807 7036
Fax No.: (012) 807 1014
e-mail address: wilda@shangoni.co.za

1.2 Expertise of the EAP

Table 1: The qualifications of the EAP

NAME	QUALIFICATIONS
Brian Hayes	Professional Engineer. M.Sc.: Environmental Engineering
Wilda Meyer	B.Sc. (Hons): Geography and Environmental Management

Table 2: Summary of the EAP's past experience

NAME	SUMMARY OF EXPERIENCE
Brian Hayes	Brian is a registered professional engineer (Chemical) with a master degree in Environmental Engineering from the University of Nottingham. Brian has 23 years' experience in environmental management and environmental engineering.
Wilda Meyer	Wilda obtained a B.Sc. Hons degree in Geography and Environmental Management through the University of Johannesburg. She has experience in conducting Environmental Management Programmes (EMPs), Basic Assessment Reports, Scoping Reports, Environmental Impact Assessments (EIAs), Waste Licence Applications, Integrated Water and Waste Management Plans (IWWMPs) and Integrated Water Use License Applications (IWULAs). Wilda also focusses on conducting environmental audits, such as EMP Performance Assessments and ISO14001 Internal Audits. She also has valuable experience in ISO14001 Environmental Management System (EMS) Implementation and has successfully implemented and obtained ISO14001 certification at various gold- and diamond mine sites.

Detailed CV's of the EAP are attached in Annexure B.

2. Description of the property

Table 3: Description of the property

<table>
<tr><td>Farm Name:</td><td>Palmietfontein 316 IR: Portions 3 (RE), 6(RE), 20, 32, 40, 41.
Winterhoek 314 IR: Portions 9, 13, 21, 22, 24, 26</td></tr>
<tr><td>Application area (Ha)</td><td>The farms covered by the Leslie 2 Project are 1,432.59 hectares (ha) in extent.
Extent of the area required for mining:
1,422.59 ha
Extent of the Area required for Infrastructure, Roads, etc. (on the mining area):
Refer to the extent / sizes included for the specific listed activities in Table 5</td></tr>
<tr><td>Magisterial district:</td><td>Lesedi Local Municipality; Sedibeng District Municipality</td></tr>
<tr><td>Distance and direction from nearest town</td><td>The Project covers the Leslie 2 Prospecting Right area and is located in the Gauteng Province of South Africa, some 71 km east of Johannesburg and 8 km west of Leandra. The Project can be reached in the following ways:
- Via the R548 paved provincial road if traveling from the north or the south.
- Via the N17 National road if traveling from the east or west.
- Via the R29 provincial road from the east or the west.
The nearest sizeable towns are Leandra, situated 8 km to the east, Delmas situated 30 km to the northwest and Devon, situated approximately 4km to the north-west. The nearest accessible railway siding is at Endicott ~ 26 km west.</td></tr>
<tr><td>21-digit Surveyor General Code for each farm portion</td><td>
<table>
<tr><th>Farm portion</th><th>21 Digit Surveyor General Code</th><th>Extent</th></tr>
<tr><td>Palmietfontein 316 IR RE Portion 3</td><td>T0IR00000000031600003</td><td>156.4684 Ha</td></tr>
<tr><td>Palmietfontein 316 IR RE Portion 6[1]</td><td>T0IR00000000031600006</td><td>122.8947 Ha</td></tr>
<tr><td>Palmietfontein 316 IR Portion 20</td><td>T0IR00000000031600020</td><td>86.4698 Ha</td></tr>
<tr><td>Palmietfontein 316 IR Portion 32</td><td>T0IR00000000031600032</td><td>122.8929 Ha</td></tr>
<tr><td>Palmietfontein 316 IR Portion 40</td><td>T0IR00000000031600040</td><td>Road servitude</td></tr>
<tr><td>Palmietfontein 316 IR Portion 41</td><td>T0IR00000000031600041</td><td>Road servitude</td></tr>
<tr><td>Winterhoek 314 IR Portion 9</td><td>T0IR00000000031400009</td><td>302.3278 Ha</td></tr>
<tr><td>Winterhoek 314 IR Portion 13</td><td>T0IR00000000031400013</td><td>59.9572 Ha</td></tr>
<tr><td>Winterhoek 314 IR Portion 21</td><td>T0IR00000000031400021</td><td>217.9732 Ha</td></tr>
<tr><td>Winterhoek 314 IR Portion 22</td><td>T0IR00000000031400022</td><td>363.6115 Ha</td></tr>
<tr><td>Winterhoek 314 IR Portion 24</td><td>T0IR00000000031400024</td><td>Road servitude</td></tr>
<tr><td>Winterhoek 314 IR Portion 26</td><td>T0IR00000000031400026</td><td>Road servitude</td></tr>
</table>
</td></tr>
</table>

Refer also to Figure 3 below for a map showing the farm portions.

[1] Remaining Extent of Portion 6 of the farm Palmietfontein 316 IR and Portion 22 of the farm Winterhoek 314 IR have been consolidated (as per information provided by land owner (Dr Cornelius Lucas Muller).

Table 4: Surface rights owners and title deed numbers

Farm portions	Title deed no	Surface rights owner
Palmietfontein 316 IR RE Portion 3	T84941/2015	Michael Clinton Pedro
Palmietfontein 316 IR RE Portion 6	T14044/1976	Lucas Cornelis Muller
Palmietfontein 316 IR Portion 20	T84941/2015	Michael Clinton Pedro
Palmietfontein 316 IR Portion 32	T100842/2014	East Rand Suppliers (Pty) Ltd.
Palmietfontein 316 IR Portion 40	-	SANRAL[2]
Palmietfontein 316 IR Portion 41	-	SANRAL
Winterhoek 314 IR Portion 9	T5080/2013	S.K Trust
Winterhoek 314 IR Portion 13	T83793/2012	S.K Trust
Winterhoek 314 IR Portion 21	T13044/2010	S.K Trust
Winterhoek 314 IR Portion 22	T58345/1988	Lucas Cornelis Muller
Winterhoek 314 IR Portion 24	-	SANRAL
Winterhoek 314 IR Portion 26	-	SANRAL

3. Locality map

The locality of the proposed Leslie 2 mining operation is presented in Figures 1 and 2 below. Refer to Figure 3 below for the farm portions associated with the project area.

[2] South African National Roads Agency Limited

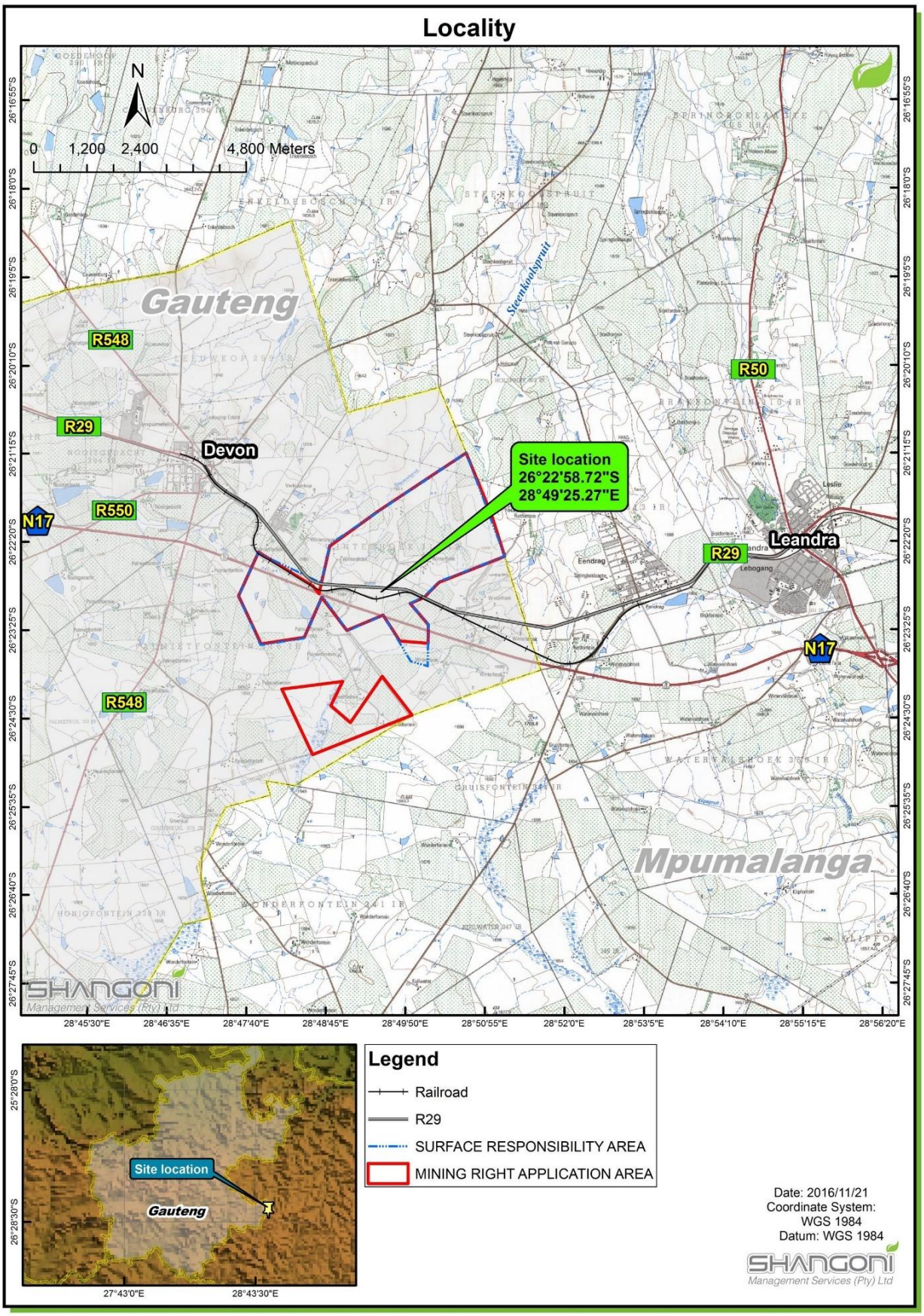

Figure 1: Locality map

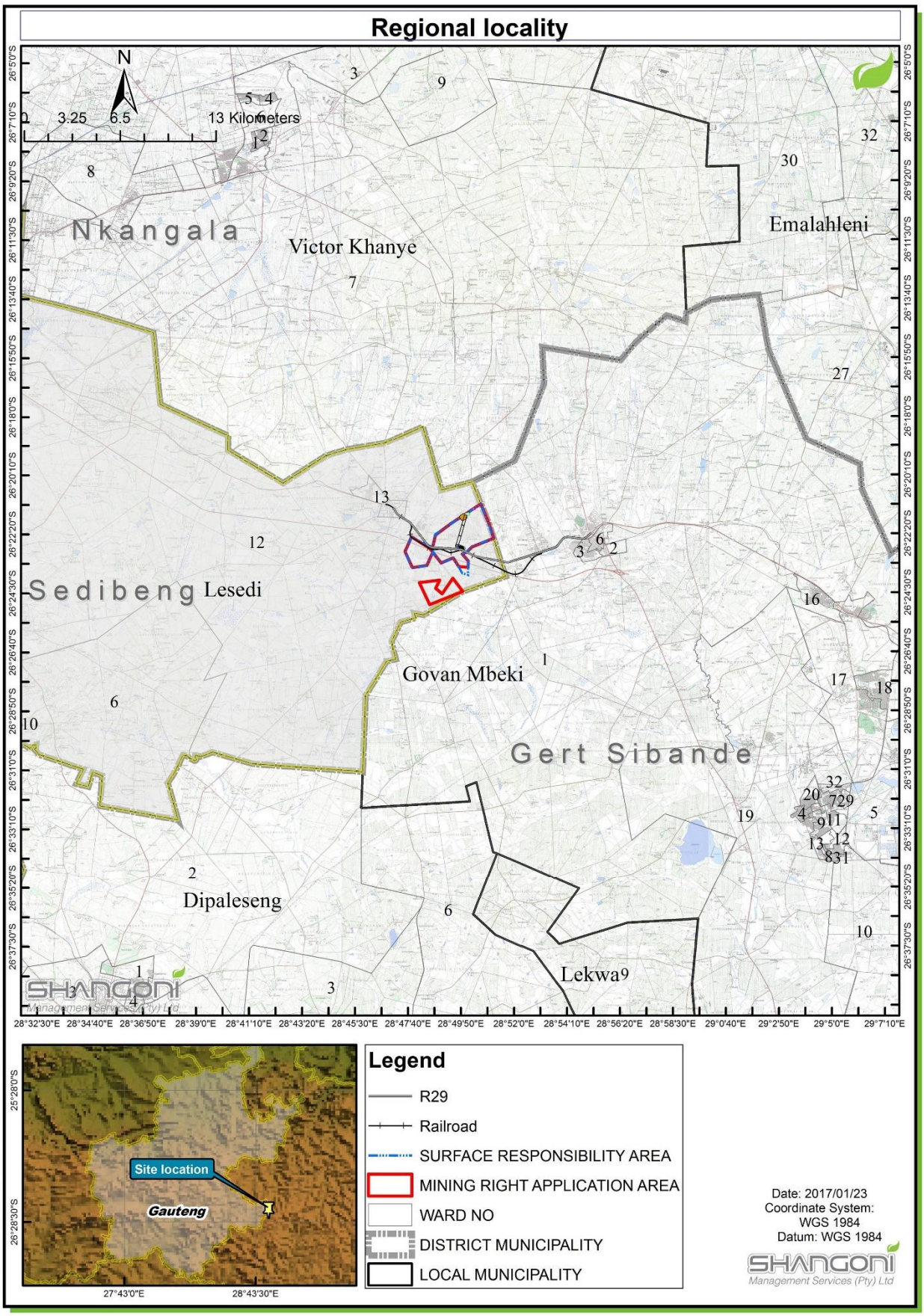

Figure 2: Regional locality map

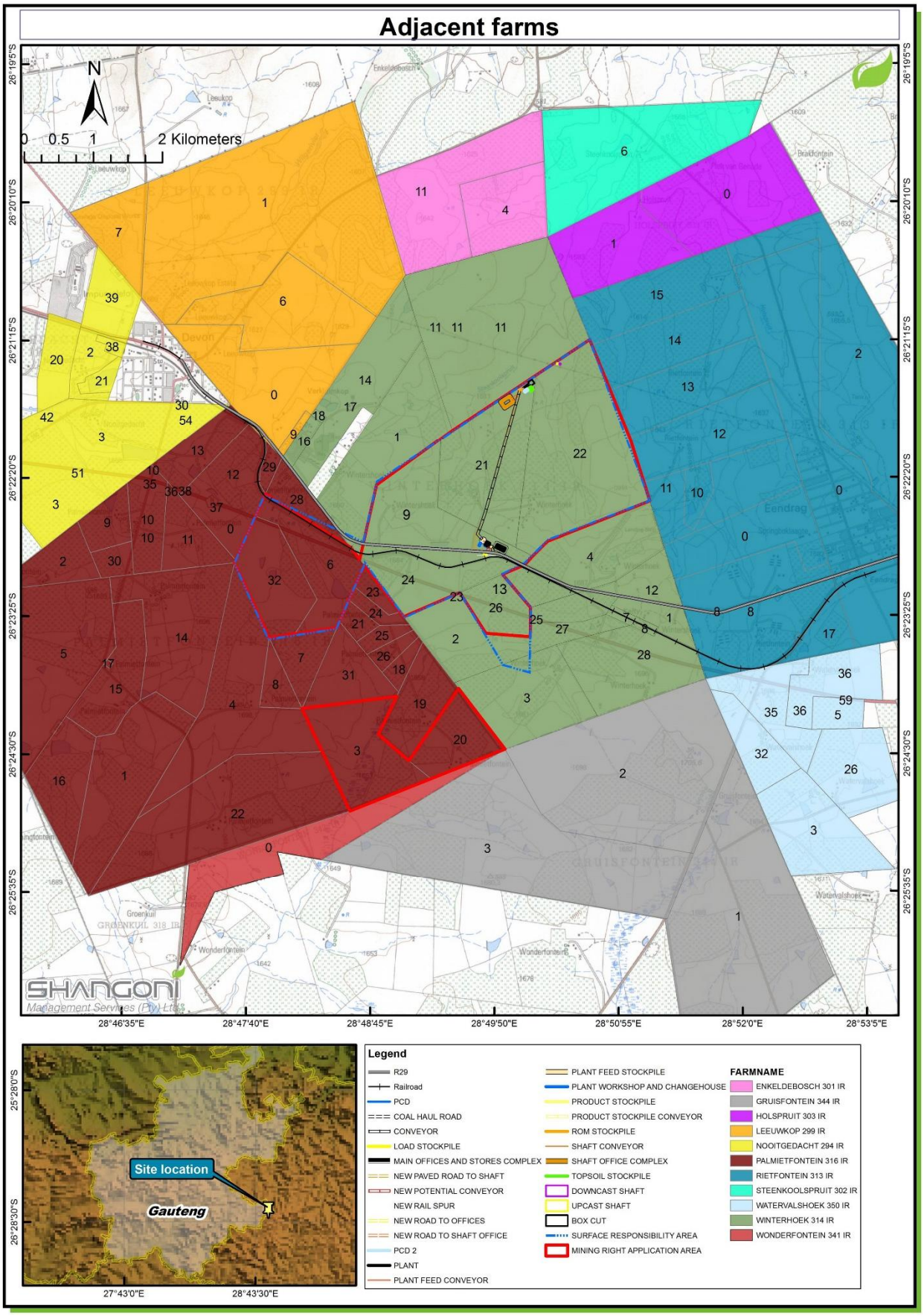

Figure 3: Farm portions map

4. Description of the scope of the proposed overall activity

Anglo Operations (Pty) Ltd applied for a prospecting right in June 2005 in terms of section 39 and regulation 52 of the Mineral and Petroleum Resources Development Regulations (GN R527 dated 2004) (MPRDR) as published under the MPRDA, and compiled a Prospecting Environmental Management Plan (EMP) in support of the mentioned application for the proposed Leslie 2 underground coal mining project, located near the town of Devon in the Gauteng Province.

The prospecting right (File number GP 30/5/1/1/2/25 PR) was granted in January 2007 and expired on 08 January 2012.

As per clause 3.3 of the above-mentioned prospecting right, any application for a renewal of the prospecting right was to be submitted to the office of the Regional Manager no later than 60 working days prior to the date of expiry of the right. Anglo Operations (Pty) Ltd applied for the renewal of the prospecting right on 17 August 2011.

The above-mentioned application for renewal was approved by the Minister on 26 April 2013 subject to the same terms and conditions as contained in the principal right. The mentioned right was renewed for a further period of three years commencing on 02 July 2013 and ending on 01 July 2016 (File number: GP 30/5/1/1/2 (10 027) RPR) (Prospecting Right number: 60/2013 (PR)).

Refer to Annexure D for copies of the mentioned prospecting right and renewal documentation.

On 29 June 2016, Anglo Operations (Pty) Ltd submitted an application for a mining right (in terms of the MPRDA) and environmental authorisation and waste management licence in terms of NEMA and NEMWA, respectively, for the proposed Leslie 2 project, to the Department of Mineral Resources (DMR). The mentioned application was submitted in terms of the EIA Regulations, 2014 and the DMR's one integrated system. The DMR acknowledged receipt of the application form in a letter dated 20 July 2016 (refer to Annexure C).

Shangoni Management Services was appointed as the independent Environmental Assessment Practitioner (EAP) to facilitate the mining right-, environmental- and waste management licence authorisation process as well as to compile the Scoping Report, Environmental Impact Assessment Report (EIAR) and Environmental Management Programme Report (EMPr). The Scoping Report was submitted on 15 August 2016, and subsequently accepted by the DMR on 16 October 2016 (refer to Annexure C).

Subsequent to receiving the Scoping Report acceptance letter, Shangoni Management Services submitted a letter to the DMR requesting for an extension on the submission of the Environmental Impact Assessment Report (EIAR) and Environmental Management Programme Report (EMPr) (submission of the EIAR / EMPr within 156 days of the acceptance of the Scoping Report, which would provide an additional 50 days for submission as per sub-regulation 23(1)(b) of the EIA Regulations, 2014. The request was granted by the DMR in a letter dated 19 December 2016 (refer to Annexure C).

This document serves as the EIAR / EMPr for the above-mentioned project and was made available for public review for a period of 30 days, prior to submission of this final report to the DMR. This EIAR / EMPr is the technical document in support of an integrated application made to the DMR (i.e. mining rights application, environmental authorisation application and waste management licence application).

The Leslie 2 underground coal mining project proposes to mine two seams from the Ecca Group of the Karoo Supergroup, which correlates to the seams in the Witbank Coalfield.

The anticipated production will be between 1.4 million tonnes per annum and 1.6 million tonnes per annum of the run of mine coal. It is proposed that the coal will only be screened and crushed, with no discard, before being transported via road to customers, which are anticipated to be Eskom power stations.

It is anticipated that the Leslie 2 Project will have a lifespan of approximately 16 years, inclusive of the construction period.

Infrastructure to be constructed include a crushing and screening plant, adit with decline shaft, water supply and reticulation network, road infrastructure, conveyor system, offices and associated buildings, stores and workshops (including vehicle wash bay), as well as a waste storage and sorting yard. All the required mine infrastructure for the project area will be established on the Leslie 2, Prospecting Right area (specifically on portions 9, 21 and 22 of the farm Winterhoek 314 IR).

Refer to Figure 4 for the final project Site Plan, Figure 5 for the Shaft Complex Site Plan and Figure 6 for the Plant Complex Site Plan.

4.1 Listed and specified activities forming part of this EIAR / EMPr

Table 5: Activities and listed activities associated with the proposed development[3]

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
Site clearance	Total clearance for Plant Complex: 61 000m² Total clearance for Shaft Complex: 37 975m² Roads: 2984m in length Conveyor system: 2770m in length	X	• Activity 15(i) & (ii) of GN R984 • Activity 12(a)(ii) of GN R985
Underground adit excavation with decline shaft to provide access to the underground mining area.	Adit with berm: 13 000m² Berm: 3 000m² ROM stockpile pad: 3 600m²	X	• Activity 21 of GN R984 • Activity 15(a)(i) of GN R985
Use, stockpiling and disposal of mine residue: • Soft material (overburden) used to construct a berm around the adit. • Hard material (overburden) used to create the ROM stockpile pad at shaft / adit. • Soft- and hard material will be placed back in the adit on mine closure, followed by the placement of topsoil.		X	• Activity 7 (Category B) of GN 921 • Activity 11 (Category B) as per GN 921 (as amended)
Stockpiling:	Stockpile itself: 1 500 m²	X	• Activity 6 of GN R984

[3] Sub-sections of listed activities not previously included in the initial application form submitted to the DMR on 29 June 2016, were included in the amended application form attached to the Scoping Report. Refer to Annexure C5 and also to the description in Table 6 below.

[4] Mining- and related activities referred to in risk assessment table relates to all mining and related activities listed in the table above. This has been collectively used as one term for impacts related to socio-economic aspects.

[5] Listed activities as contained in Listing Notice 3 of GN R985 have been included in the table above since the proposed project site falls within in a Critical Biodiversity Area (CBA) and Ecological Support Area (ESO). Refer to Chapter P of Part 7.4.1 of this EIAR / EMPr.

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
6000 tonne ROM Stockpile at the shaft top / adit.	Total area for stockpiling and moving of coal (as per above): 3 600m²		
Stockpiling: Topsoil stockpile area at Shaft adit	2 500m²	X	• Not listed
Stockpiling: 6000 tonne ROM / plant feed stockpile at plant	• Stockpile itself: 1 500 m² • Total area prepared for stockpiling and moving of coal: 3 600m²	X	• Activity 6 of GN R984
Stockpiling: 6000 tonne product stockpiles at plant	• Area required for 3 pre-certified stockpiles: 2500m² each (7500m² in total for pre-certified stockpiles) • Area required for the conical stockpile: 1500m² • Total area required for product stockpiling at the plant: 9000m²	X	• Activity 6 of GN R984
Underground mining (bord and pillar)	2 Seam and 4 Seam Select Refer to Figures 7 and 8	X	• Activity 17 of GN R984
Undermining of wetlands			• Not listed
Drilling and blasting activities			• Not listed
Ventilation shaft with the main fan situated on this shaft.	Total fenced area at Ventilation Shaft: 2 000m²		• Not listed (site clearance forms part of overall project site clearance)
Use and maintenance of chemical / portable toilets during construction	Toilets will be portable and only to be placed		• Not listed

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
	on-site for the period related to the Construction Phase		
Offices, Stores, Change houses, Workshops, Lamp Room, all prefabricated structures that allows for easy removal and rehabilitation of the site.	Shaft Office Complex: 15 500m² Plant Office Complex: 10 800m² Plant workshops sections: 3 280m²		• Not listed
Crushing and Screening Plant	Crushing and Screening Section: 2 700m² The above forms part of the total Plant footprint area: 61 000m²	**X**	• Activity 21 of GN R984
High-density polyethylene-lined (HDPE) pollution control dams (PCDs)	PCD1 at Plant Complex: 1 500m² PCD2 at Shaft Complex: 1 000m²	**X**	• Activity 6 and 16 of GN R984
Conveyor system: • **Shaft conveyor:** Conveyor from underground to ROM stockpile at the shaft / adit • **Overland conveyor**: Conveyor from ROM stockpile at the adit to the Screening and Crushing Plant • **Plant feed conveyor**: Conveyor that feeds the coal from ROM Stockpile at plant to the screening section • **Product stockpile conveyor(s)**: Conveyors that collects coal from screening	Shaft Conveyor: • 90 m • 0.8 to 13m high Overland Conveyor: • 2 270 m • 0.8 to 16m high Plant Feed Conveyor: • 90 m • 0.8 to 13m high Product Stockpile Conveyor (if road	**X**	• Activity 12 (xii) of GN R983 • Activity 19(i) of GN R983 • Activity 24 of GN R984

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
section underflow and coal from mineral sizer and feeds it onto the product stockpile(s)	transport alternative is implemented): • 90m • 0.8 to 16m high Potential additional Product Stockpile Conveyor (if rail transport alternative is implemented): • 230 m • 0.8 to 16m high		
• Light Duty Vehicles (LDV) paved road running from the R29 to the Shaft Complex that will be constructed along the overland conveyor route. • Proposed road to Shaft offices (turn off from the above-mentioned LDV road) • Coal haul road from the R29 to the Plant (if road transport alternative TA1 is implemented) • Proposed road to Plant offices (turn off from new access / haul road – from R29)	LDV road from R29 to Shaft: 2 400m Proposed road to Shaft offices: 200 m Coal haul road from R29 to Plant: 304m Proposed road to Plant offices: 80m	X	• Activity 56(ii), 24(ii), 12(xii), 19(i) of GN R983 • Activity 27(iii) of GN R984 • Activity; 4(c)(iv), 18, 12(a)(ii) of GN R985 • Activity 24 of GN R984
Transport Alternative (TA) 2: Rail Establishment of train loading spur on current rail line crossing the Leslie 2 Project area.	Link – approximately 320 m	X	• Activity 12 of GN R984
Water reticulation, including: • Small water collection areas will be used underground (± 200 m² areas) for temporary collection of water from where it will be used for dust suppression methods	Underground water collection area: ± 200 m² Dewatering pipeline to PCD2: Approximately 200m	X	• Activity 9(i)(ii) GN R983 • Activity 10(i)(ii) GN R983 • Activity 12 (i); (ii); (iii); (iv) (vi) and (xii) of GN R983 • Activity 6 of GN R984

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
and pumped to surface (PCD's) (dewatering activity). • Dewatering pipeline from underground to PCDs; • Concrete lined drainage channels at the plant area to convey affected runoff generated on site towards the proposed silt and oil trap (as per SWMP[6] – Annexure H3) • Diversion berms on the northern and southern boundary of the proposed plant area to prevent clean surface runoff from entering the plant area, including culvert at access road (as per SWMP – Annexure H3) • Wall around the coal load (product) stockpile at the Plant (for Transport alternatives TA2 and / or TA3) (as per SWMP – Annexure H3) • Concrete lined drainage channels downstream of the shaft area to convey affected runoff generated on site towards the proposed silt and oil trap at Shaft Complex (as per SWMP – Annexure H3) • Diversion berms on the southern and north eastern boundary of the proposed shaft area (as per SWMP – Annexure H3)	Water pipeline to PCD 1: *To run in the same footprint as overland conveyor and LDV road from Shaft*: Approximately 2 400m Oil / silt trap at Plant: ± ± 60m² Concrete channels at Plant: 447m in length Diversion berms at Plant: 427m in length Wall around coal product stockpile (south of R29) at Plant: 64m Oil / silt trap at Shaft: ± ± 60m² Concrete channels at Shaft: 307m in length Diversion berms at Shaft: 420 m in length		
Boreholes for potable water abstraction estimated at 40kL/ day[7]	Less than 15m² in extent per borehole.		• Not listed

[6] Storm water management plan

[7] Alternative: Rand water supply.

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
	Refer to groundwater study (Annexure H5) for more detail with regards to pump tests and methods for siting boreholes.[8]		
Reservoirs for storage of potable water.	1x 50 kL Erikson tank for raw borehole water and 1x 10 kL tank for drinking water	**X**	• Activity 2(c)(iv) of GN R985.
Small water treatment facility (to treat borehole water for drinking purposes).	Proposed small plant to treat 2 to 3 Kl of water for drinking purposes per day.	**X**	• Listed activities' thresholds not triggered
Septic tanks at offices and change houses	Forms part of Shaft- and Plant Complex footprint areas		• Not listed
Waste management, including: Waste storage and sorting yard	<u>Waste storage and sorting yard</u>: 200m^2		• Not listed
Maintenance activities on-site (including workshops)	<u>Plant workshops and change house area:</u> 3 280m^2 <u>Shaft workshops</u>: *Forms part of Shaft Office Complex footprint:* 15 500m^2 <u>Underground</u> – if required (no workshops underground)		• Not Listed

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
Vehicle wash bay	Wash bay area: 225m² *Forms part of Shaft Office Complex footprint:* 15 500m²		• Not listed
Diesel and explosive storage facilities.	1x Diesel tank at Shaft workshop: 10 000 litre tank with associated bunded area *Forms part of Shaft Office Complex footprint:* 15 500m² Explosives magazine: *Two small brick buildings (for explosives and detonators):* Footprint: 400 m²	X	• Activity 14 of GN R983 • Activity 4 of GN R984 • Activity 10(c)(iv) of GN R985
Standby diesel generators as alternative power supply. Surface Consumer Substation will consist of: • Two pole-mounted Ganged Isolators with surge arrestors; • Two skid-mounted Oil Natural Air-cooled transformers fitted with: ➢ Automatic 16-step tap switch changer ➢ Primary circuit breaker ➢ Secondary circuit breaker ➢ 25-Amp dry-type continuously rated Neutral Earthing Resistor	The capacity of the two (2) diesel generators will be 2,000 kilo Watts (kW) each and it will generate at either 400 V, or 1,000 volts (1 kV) or at 11,000 volts (11 kV). Footprint: 300m²		• Under thresholds

NAME OF ACTIVITY[4]	ARIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY (mark with X)	APPLICABLE LISTING NOTICE (GN R983, GN R984, GN R985 or GN 921)/NOT LISTED[5]
➢ Primary, secondary, transformer, and neutral earthing resistor protection ➢ Controllers (Automatic tap switch changer) ➢ 22 kV voltage transformer • One skid-mounted breaker skid with: ➢ Two incoming breakers ➢ One lighting transformer ➢ Bus section breaker ➢ Two reactor capacitor inductive system feeders ➢ Two underground feeders ➢ Four surface feeders • Earthing system as per SANS requirements. • Two PFC systems.			
Rehabilitation activities	Removal of above infrastructure and ceasing of above activities after Life of Mine. Refer also to Annexure K	X	• Activity 22(i)(ii) of GN R983
Mine Closure			

Refer also to Figures 4, 5 and 6 below for the site layout plans.

4.2 Listed and specified activities removed since the submission of the original application form to the DMR on 29 June 2016

The listed activities applied for, have since been amended in the environmental authorisation application form. The listed activities that have been removed from the application form, are included in Table 6 below. Refer also to Table 5 above for the complete list of activities associated with the project. The amended application form submitted along with the Scoping Report (and additional reference page to listed activities confirmed or excluded during the EIA Phase) is attached hereto in Annexure C5.

Table 6: Listed activities removed from application form

Activity description	Listed activity removed from application	Comment
Site clearance	• Activity 12(c)(ii) of GN R985	Only Listed activity 12 (c)(ii) of GN R985 is removed (clearance activity related to Eskom powerline) has been removed. Subsection (a)(ii) of listed activity 12 of GN R985 still remains applicable. Refer to Table 5 above.
Complete 10.7 km Wolf conductor overhead power line • Single pole construction • Earth screen on top • SANS compliant • Ganged Isolators at termination points • Substation class surge arrestors	• Activity 11, 12 (xii) and 19 of GN R983 • Activity 24 of GN R984	Activity and all listed activities associated therewith removed. This activity will be applied for as part of a separate Environmental Authorisation application.
Underground adit excavation with decline shaft to provide access to the underground mining	• Activity 27 of GNR 983	Only the mentioned listed activity has been removed since the clearance of an area of indigenous vegetation larger than 20 ha (for the project in total) has been applied for as well. Note: The activity and the remainder of listed activities associated therewith are still applied for. Refer to Table 5 for the full list of activities applied for.
A road running between the shaft and Plant that will be constructed along the overland conveyor route and in the same servitude. Internal roads will be 6m wide surfaced roads, with semi-mountable curbs and non-mountable curbs on both sides of the road.	• Activities 4(a)(ii)(ee) and 12(c)(ii) of GN R985 *(Specifically, for a road that would have been applicable to the powerline in the Mpumalanga Province – which has been removed from the application)*	Only the mentioned listed activity has been removed. The following activities still remain applicable (refer to Table 5 above): • Activity 56(ii), 24(ii), 12(xii), 19(i) of GN R983 • Activity 24 of GN R984 • Activity 27(iii) of GN R984 • Activity 4(c)(iv), 12(a)(ii); and 18(c) of GN R985

Activity description	Listed activity removed from application	Comment
Sewage Treatment Plant[9] and Post-closure Water Treatment Plant[10]	• Activity 16 and 25 of GN R983 • Activity 6, 11(i), (ii) and (iii) and 25 of GN R984	Septic tanks will be installed at the mine and therefore this activity has been removed from Table 5 above.
Potential river diversions[11]	• Activity 12(i); (ii); (v); (vi); (xii) of GN R983 • Activity 19(i) GN R983 • Activity 24 of GN R984	No river diversions are anticipated to take place for the project and therefore this activity has been removed from Table 5 above.

[9] Additional listed activity that has been removed from list of activities applied for since Scoping Report submission

[10] The location of the water treatment plant has not been determined at this point, as it is considered that water treatment will only be required after the end of the Life of Mine (LoM).

[11] Additional listed activity that has been removed from list of activities applied for since Scoping Report submission

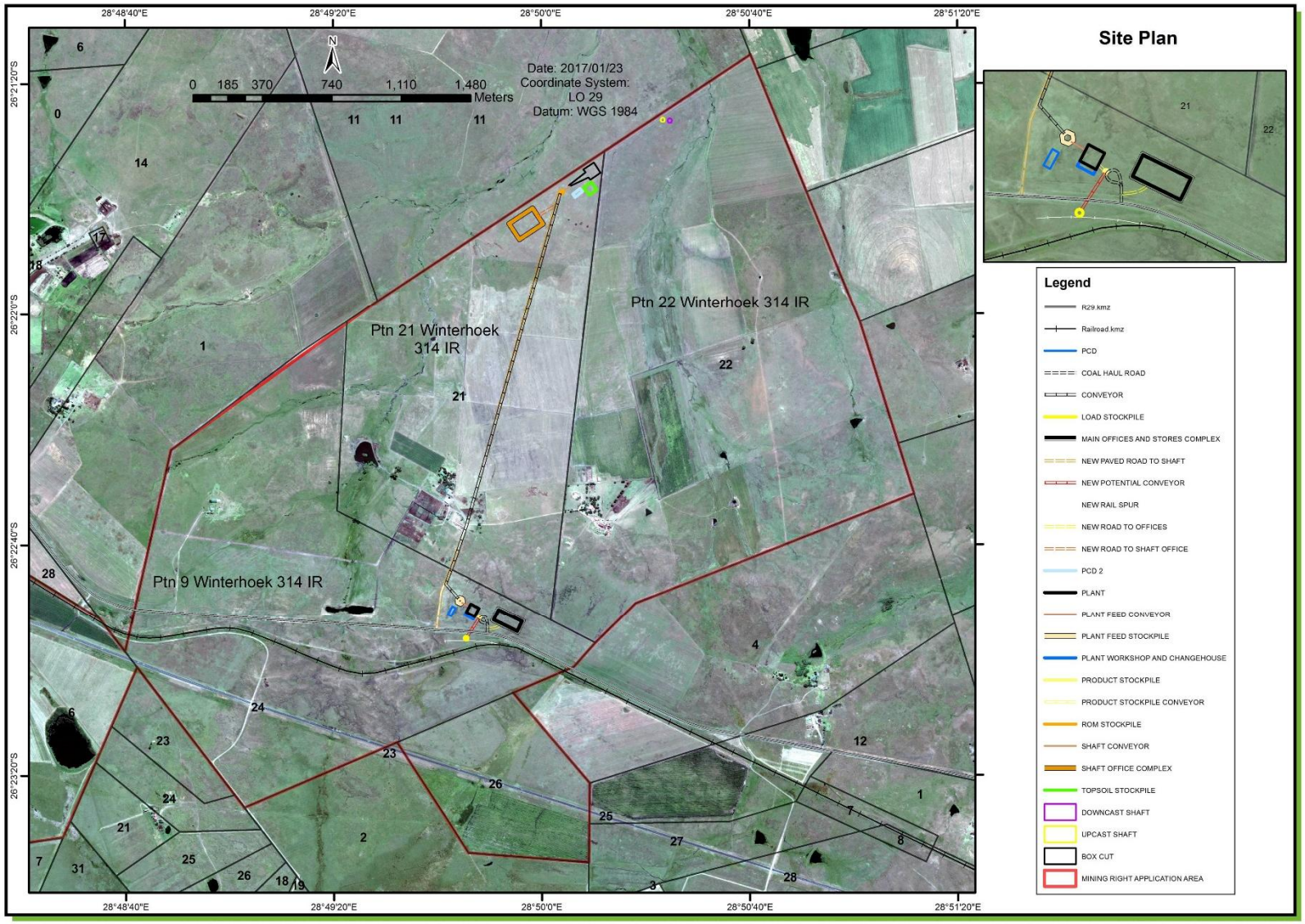

Figure 4: Final Site Plan

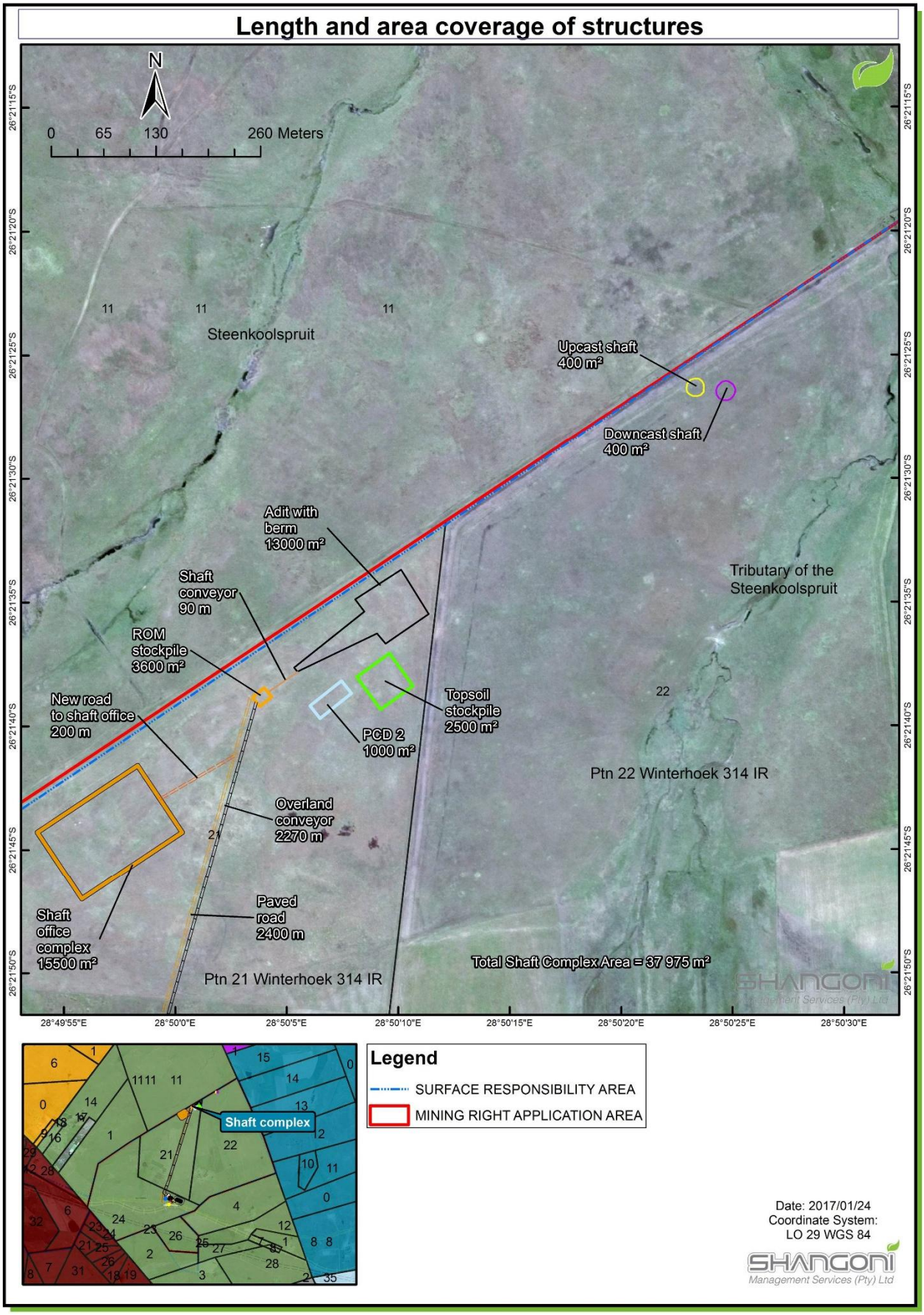

Figure 5: Shaft Complex Site Plan

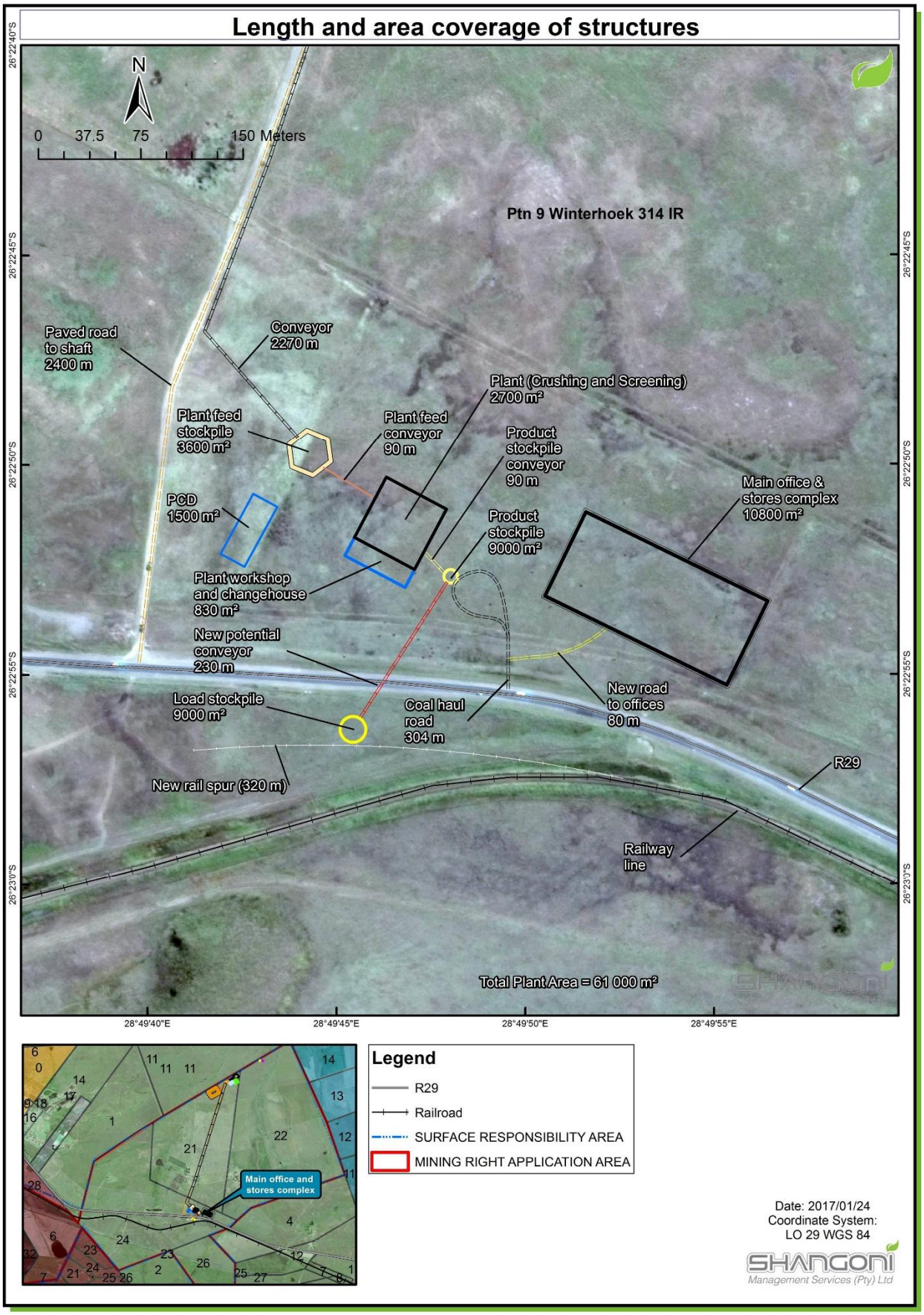

Figure 6: Plant Complex Site Plan

4.2 Description of the activities to be undertaken

4.2.1 Mineral to be mined

The mineral deposit to be mined at the proposed Leslie 2 mining operation is that of coal. The quality of coal associated with the project area finds application in the following industry sectors:

- South African power generation (Eskom and other local coal independent power producers (IPPs));
- Indian coal-fired power generation;
- Cement production; and
- Production of liquid synthetic fuels – Synfuel (e.g. Sasol).

The Leslie 2 coal product is best described as a thermal coal where it is more likely to find application. Refer to Annexure E for a copy of the Mining Works Programme.

The depth of the mineral below surface is 150 m to 187 m.

The Leslie Coalfield forms part of the Highveld Coalfield, and has a stratigraphic sequence that is broadly similar to that of the Witbank Coalfield. It is located around the town of Leandra. The coal deposit that occurs on the project area can be classified according to the South African National Standard (SANS) 10320:2004 definition of a multiple seam deposit type.

All of the major seams of the Highveld Coalfield are present including the 5 Seam, 4A Seam, 4 Seam, 3 Seam, 2 Seam, and 1 Seam, although the 4A Seam, 3 Seam, and 1 Seam may not be present throughout the Coalfield and is too thin to mine. Refer to Table 7 below for a description of the seams.

Table 7: Description of the seams

Seam	Description
5 Seam	The 5 Seam has an average thickness of 1.57 m, and consists of mostly bright, finely laminated coal with minor shale bands towards the base of the Seam. The 5 Seam is only present in the eastern part of the southern block of the Project Area and is not considered economical to mine due to its thickness and the small quantity present.
4 Upper Seam	The 4 Upper Seam lies ~ 1 m to 4 m above the 4 Seam, and has an average thickness of 2.12 m. A dull shaley coal band is consistently formed in the centre of this Seam. The top and bottom bands consist of bright to mixed dull lustrous coal of average thickness of less than (<) 0.5 m. The 4 Upper Seam is not present in the Leslie 2 Project Area.
4 Seam	The 4 Seam has an average thickness of 5.61 m, and has an upper roof coal horizon and lower select coal horizon. The fossil marker horizon is absent. The upper coal horizon (S4T) averages 2.86 m in thickness, and consists of interlaminated dull coal and shale, with occasional bands of

Seam	Description
	bright coal. The select horizon (S4S) is mixed dull lustrous and averages 2.75 m thick. The S4S has reasonable qualities and will be the target seam for mining.
2 Seam	The 2 Seam has an average full seam thickness of 3.68 m, and consists of two inconsistently developed units: a low-quality roof zone (S2T) averages 1.26 m in thickness and a select zone of brighter coal (S2S) averages 2.3 m in thickness. The low-quality floor zone is rarely developed and was not considered in this resource calculation.
General Seam Information	The seams are relatively flat-lying and due to the increase in surface elevation, there is an increased depth to the top of the seams towards the south and west of the Project Area. No major faults or dolerites have been identified.

For the 4 Seam, only the 4 Seam Select will be mined as the full 4 Seam has poor qualities. The full 2 Seam will be mined over most of the project area as the qualities are generally acceptable.

4.2.2 Description of the main mining activities and processes

The Leslie 2 project will be undertaken on the Leslie 2, 46/2007 Prospecting Right area. Mine infrastructure will be situated on Portions 9, 21 and 22 of the farm Winterhoek 314 IR.

The mine infrastructure will include the following:

- An adit (with berm) and decline shaft to provide access to the underground mining.
- Run of Mine (ROM) stockpiles.
- Product stockpiles.
- Topsoil stockpiles.
- Ventilation shaft.
- Offices, stores, workshops, change houses, and lamp room, all pre-fabricated structures that allows for easy removal and rehabilitation of the site.
- Waste storage and handling facility.
- Hazardous storage and handling facilities (such as diesel – and explosives storage facilities)
- Vehicle wash bay.
- Parking areas at the Shaft offices and main (Plant) offices.
- Screening and Crushing Plant.
- Conveyor system.
- An access road to the shaft that will be constructed along the overland conveyor route and in the same servitude, and an additional section to the Shaft offices.
- A haul road and access road from the R29 to the main offices and plant area.
- Water storage and reticulation facilities and structures.

4.2.2.1 Mining method

The total resource will be mined by means of underground mining using the conventional bord and pillar mining method deploying continuous miners with shuttle cars, supported by roof bolters for roof support and load haul dumpers for sweeping. The mine will be designed for the maximum extraction on the advance with no pillar extraction on retreat. The safety factors applied for main developments is 2.0 and for secondary production panels 1.6.

It is planned to establish three continuous miner production sections producing between 120,000 and 130,000 tons per month. A stone development section will be established for developing through dykes and faults. This will ensure that the continuous miner sections focus on coal production only. The mine design will allow for the introduction of additional production sections, if required in the future. Refer to Annexure E for more detail in this regard.

4.2.2.1 Mine schedule

The mine scheduling for the 2 Seam is indicated in Figure 7 and for the 4 Seam in Figure 8 below.

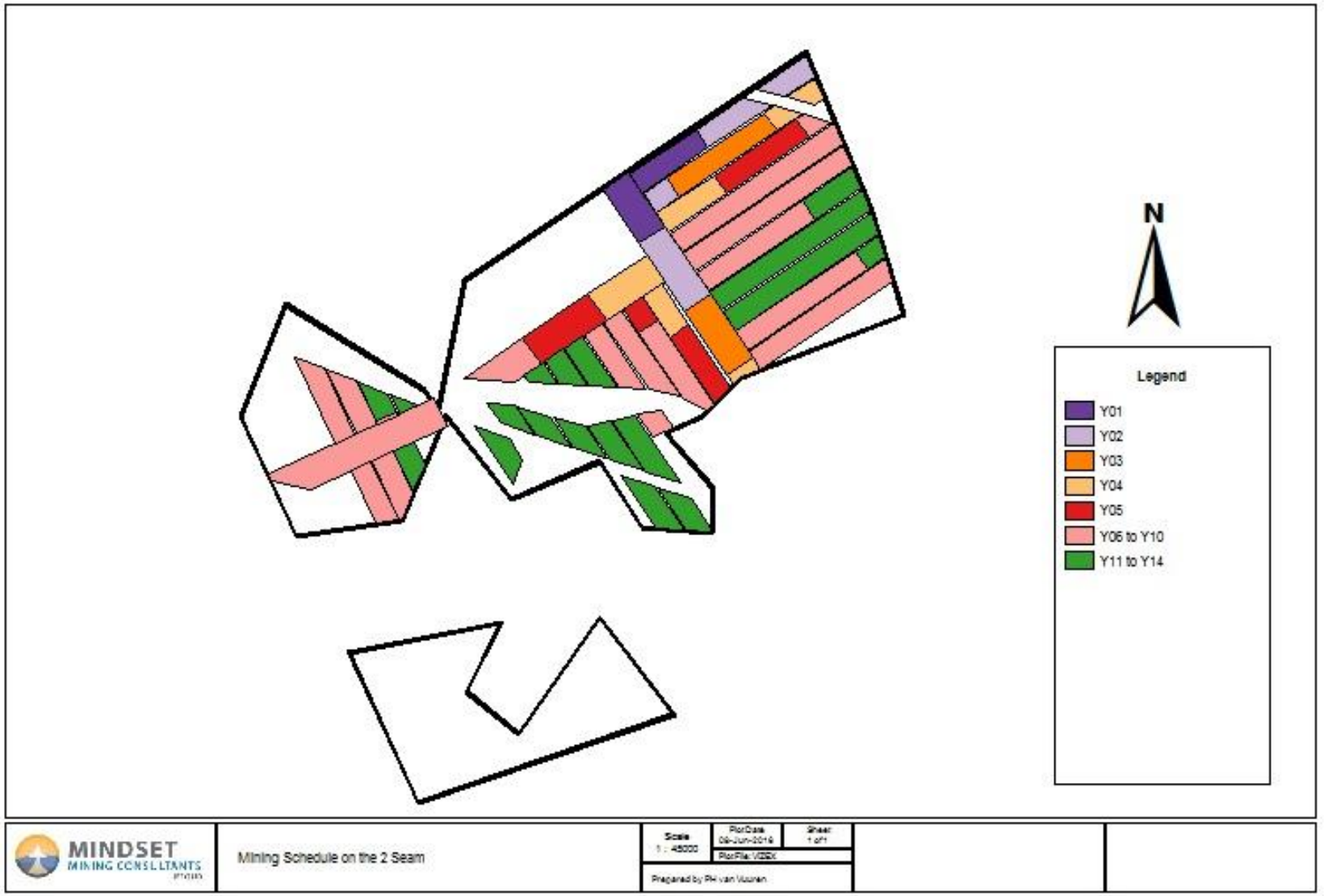

Figure 7: Mining layout and schematic mining schedule for the 2 Seam (Mindset Mining Consultants; 2016)

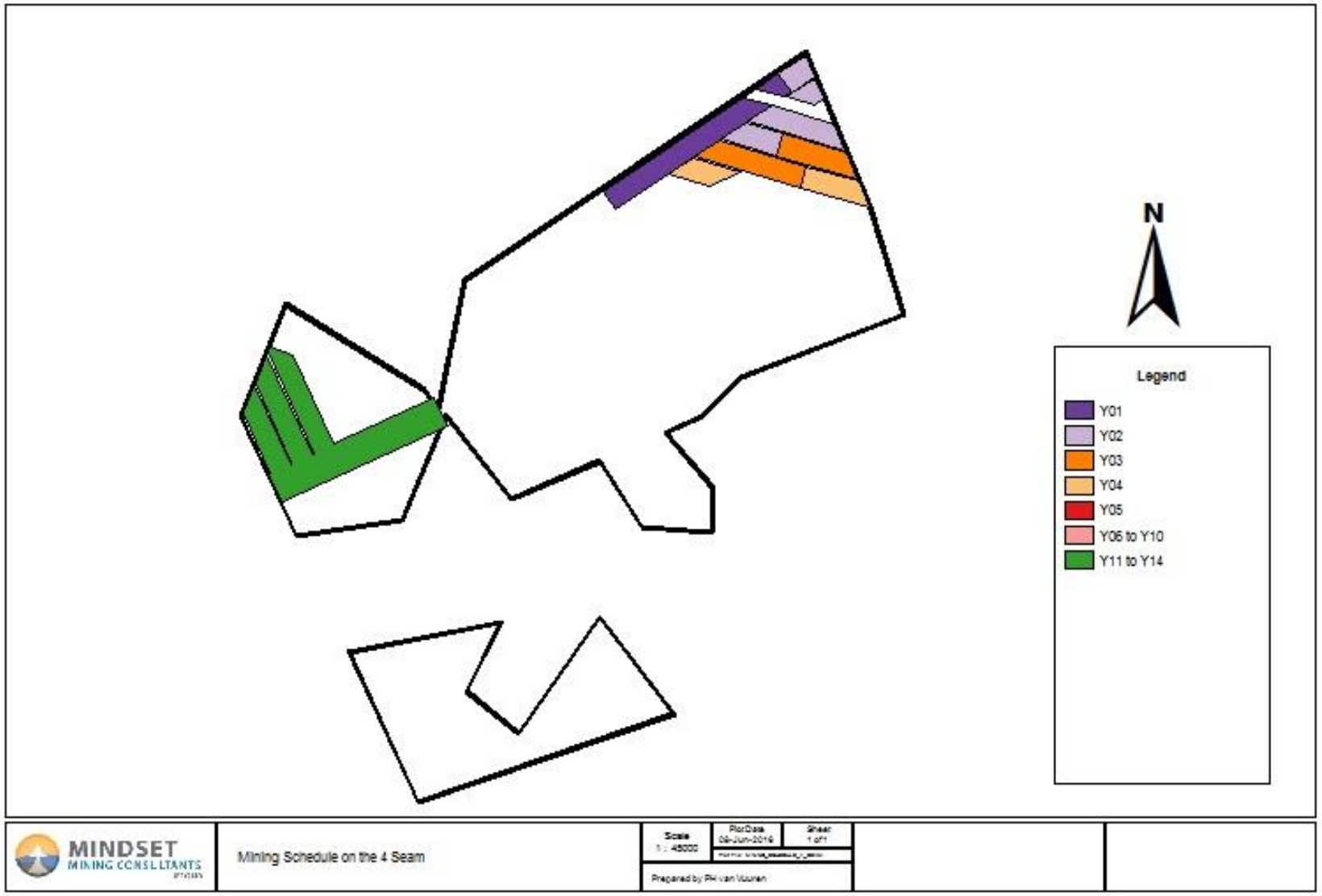

Figure 8: Mining layout and schematic mining schedule for the 4 Seam Select (Mindset Mining Consultants; 2016)

4.2.2.2 Ore processing

The market for the coal from the Leslie 2 project area is to supply an Eskom 20.0 MJ/kg product. The coal from the project area will be screened and crushed to minus (–) 50 millimetres (mm) and sold raw as a 20.0 MJ/kg product with a plus (+) 20 percent VM content.

The target market for the coal is for Eskom. The ROM coal will be produced by continuous miners and fed through feeder breakers and the maximum size will be 200 mm before being conveyed out from underground. The –200 mm ROM coal will flow over a –50 mm screen to remove all the –50 mm material. The -50 mm oversize will be fed through a sizing crusher that will reduce the top size to - 50 mm. The feed from the crusher will join the –50 mm underflow from the screen and the total –50 mm product will be fed onto the product stockpile, from where it will be loaded onto rail or road wagons for hauling to the power stations.

The plant will be operated to process a minimum of 1.5 Mtpa of RoM coal and is expected to achieve an average total yield of 100 percent for the Eskom product. Two hundred (200) tonnes ore will be fed through the crusher per hour (Mindset communication, 2016).

There will be a conical RoM stockpile with a 6 000 tonne capacity before the crushing and screening plant. After the plant process there will be another 6 000 tonne stockpile for the crushed product (i.e. product stockpile). In addition, three separate pre-certified stockpiles will be created by moving coal with front-end loaders from the conical product stockpile to these stockpiles. Each of these stockpiles will have a 6 000 tonne capacity.

At the ROM stockpile before the plant front end loaders will only be used to move coal away from the plant ROM stockpile in the event that the plant is on stop for an extended period and the 6,000 tonne capacity has been reached. Coal will be moved away from the ROM stockpile before the plant to allow space on the stockpile which in turn will allow the overland conveyor to continue operating. When the conical ROM stockpiles at the shaft top and before the plant are empty or low, the coal moved away will be moved back to the conical stockpile areas for feeding into the system. At the conical product stockpile (after the plant), coal will be moved from the conical stockpile by a front end loader on a continuous basis to create the three pre-certified stockpiles. A second front end loader will also be used to load the product coal onto road trucks or rail wagons.

The average height of both the conical ROM stockpile before the plant and the conical product stockpile after the plant will be 7 m and the maximum will be 15 m.

The area of the conical ROM stockpile before the plant, when full, will also be 1 500 m^2. The total area prepared for stockpiling coal at the ROM stockpile before the plant will be larger to cater for space to

move coal from the stockpile when it is full and the plant is on stop. The total area that would be prepared for the stockpiling of ROM coal before the plant will be 60 m x 60 m – 3 600 m^2.

The area required for each pre-certified stockpile will be 2 500 m^2 which gives a total of 7 500 m^2 for pre-certified coal stockpiles and the conical stockpile will be 1 500 m^2.
The total area required for product stockpiling is 9 000 m^2.

Regular sampling will be conducted to ensure that the product stockpiles created conform to the client specifications. Blending of the coal will be applied where required.

The head pulley of both the ROM stockpile at the shaft and at the plant as well as the product stockpile at the plant will be enclosed on three sides and the top. Where the coal is discharged at the bottom of this enclosure a tube with holes on the sides will be attached. The coal will be discharged though these tubes which will limit the opportunity for coal dust to be blown away while the coal is discharged onto the stockpiles. Water sprays will be mounted at the top of the head pulleys where the coal is discharged into the tube to suppress the dust created at the discharge point

Figure 9 below shows the proposed plant process. Refer also to Figure 6 for the Plant layout.

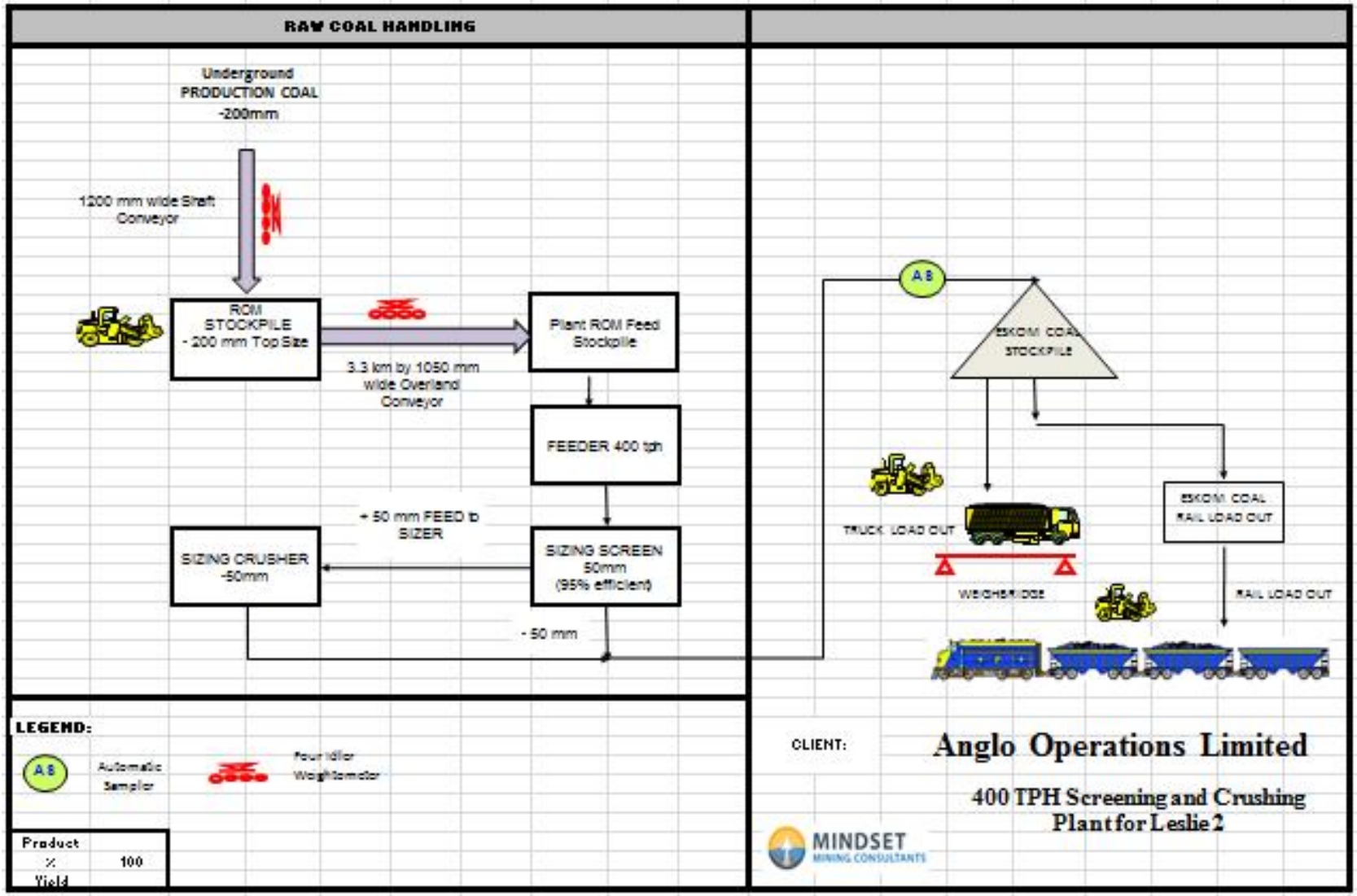

Figure 9: Proposed Plant Process (Mindset Mining Consultants; 2016)

4.2.2.3 Mine residue

The soft material excavated from the adit will be utilised to construct a berm around the adit to prevent runoff water from entering the adit and the underground works. This material will be placed back in the adit on mine closure.

The hard material excavated from the adit will be utilised to create a RoM stockpile pad at the top of the adit, as well as for construction of the pads at the machinery and vehicle entrance of the adit. The RoM stockpile and entrance pads will be lined to prevent seepage of contaminated water.

The decline shaft stone will be used on surface with the hard material from the box cut (mentioned above) to construct the ROM stockpile pad. The up-cast and downcast shaft material will be stored underground. Some of the hard material which contains no carbonaceous material, will also be applied in constructing the access road to the shaft.

No other waste rock / discard dumps or overburden stockpiles will be established on-site, other than the berm around the adit.

A waste classification (in terms of Government Notice R635) and characterisation procedure were conducted on soft and hard overburden including carbonaceous material (coal/mudstone). The results of the classification procedure are shown below:

Lithology	Classification
Sandstone (softs)	Type 4
Dolerite (hards)	Type 4
Coal & carbonaceous	Type 3

Acid-base-accounting revealed that the coal/carbonaceous mudstone lithologies could be potentially acid generating. It is therefore recommended that all carbonaceous or coal reserve material be treated as potentially acid forming to ensure that all reasonable measures are taken to minimise pollution and prevent pollution spread. Effective storm water implementation to separate clean and affected water is thus crucial including measures to limit infiltration into soil and groundwater. Refer to Annexure H5 for the results pertaining to the geochemical- and waste characterisation as well as the geotechnical inputs for waste characterisation.

4.2.2.4 Linear activities: Mineral transport on site and access to site

4.2.2.4.1 Access to the site

The Leslie 2 project area can be accessed from the R29, R548, and R 550 Provincial Roads as well as from the N17 National Highway. The R29 will be the final access road to the project area and the other three access roads link into the R29.

The R29 Provincial Road runs in a northwest to southeast direction from Springs to Leandra, and crosses the Leslie 2 project area. The R548 Provincial Road runs from the town of Delmas in a southern direction. It crosses the R29 and passes ~ 2 km to the east of the Leslie 2 Project Area. The N17 National Highway runs in a general east to west direction across the Project Area. There is an off-ramp from the N17 onto the R548, ~ 2 km to the west of the project area that allows access to the site via the R29.

4.2.2.4.2 Internal roads and conveyor system

Access to the shaft (to be located in the northern section of Portion 21 of the farm Winterhoek 314 IR), will be gained via an entrance from the R29. Refer to Figures 4 and 5. This entrance will be for Light Duty Vehicles (LDV's) only and will be an expansion of the current road leading to the farm houses / sheds on Portions 21 and 22 of the farm Winterhoek 314 IR. This road will be a 7.4m wide paved road with a single lane in both directions and will be 2.4km long. From this LDV road, an additional access road of approximately 200m will be constructed to the Shaft offices.

Access for haul trucks to and from the screening and crushing plant as well as access for staff to the main office complex at the plant, will also be gained from the R29. However, this will be a separate entrance than the road entrance for access to the shaft. Refer to Figures 4, 5 and 6. The haul road will be 304m in length and the additional access road to the main office complex at the plant will be approximately 80m.

Existing farm roads on the properties (Portions 21 and 22 of the farm Winterhoek 314 IR) will be used to gain access to the Ventilation Shaft.

The conveyor network that will be established on-site is described in Table 8 below.

Table 8: Conveyor network

Conveyor	Description / Route	Transfer Points	Height above surface	Width	Length
Shaft Conveyor	Conveyor from underground to the ROM Stockpile at the shaft / adit.	One transfer point onto ROM Stockpile at shaft / adit.	0.8m – 13m	1050mm	90m
Overland Conveyor	Conveyor from RoM stockpile at the shaft / adit to the screening and crushing plant.	One transfer point onto Plant RoM stockpile	0.8m – 16m	1050mm	2 270m
Plant feed conveyor	Conveyor that feeds the coal from RoM stockpile at the plant to the screening section.	One transfer point onto screen. Screen will have a transfer point into mineral sizer and onto the product conveyor.	0.8m – 13m	1050mm	90m
Product stockpile conveyor	Conveyor that collects the coal from the screening section underflow and the coal from the mineral sizer and feeds it onto the product stockpile An additional 230m product stockpile conveyor will be associated with alternative TA2 and / or TA3 (rail transport alternatives)	Mineral sizer will have one transfer point onto product conveyor. Product feed conveyor will have one transfer point onto the product stockpile.	0.8m – 16m	1050mm	90m (+230m for rail transport)

All conveyors will be enclosed on the one side and the top. Water sprays at the overland conveyor will be installed at the feed onto the overland conveyor at the tail end and where the coal is discharged onto the ROM plant feed stockpile. Water sprays at the Plant feed conveyor will be installed where the coal is fed onto the conveyor and where it discharges onto the screen. For the product feed conveyor, sprays will be located where the screen underflow and the mineral sizer product is fed onto the product conveyor as well as where the coal is discharged onto the product stockpiles.

4.2.2.5 Linear activities: Mineral transport off-site

Two alternatives were identified for the transportation of the mineral off-site, these are:

- Transportation by rail (TA1); and
- Transportation by road (TA2 / TA3).

4.2.2.5.1 Transportation by rail

A 20 tonne/axle railway line runs from Springs in the west, to Secunda in the east, and on to Ermelo (refer to Figures 4 and 6). This rail line crosses over the Leslie 2 project area. The establishment of a train loading spur at the project area was identified as an alternative transportation method. Refer to Section 7 of Part A for the discussion on the alternatives assessment conducted and results thereof. The alternatives assessment report is also attached as Annexure F.

Finality has not been reached as to whether the 20t/ axle rail line that crosses over the southern part of the Leslie 2 project area can economically be used to transport coal to power stations. If the rail option is successful, the total daily product of 6 250 tonnes will be transferred to rail daily. The rail wagons on the 20 t/axle line will hold 40 tonnes. Based on this, 156 wagons will be loaded per day. The number of trains loaded per day will depend on the number of rail wagons that traction units provided by Transnet Freight Rail can move. It is estimated that each train will be made up of between 50 and 55 wagons, resulting in three trains per day.

If deemed acceptable to Transnet Freight Rail, the coal produced can be loaded onto rail wagons for transport to either Majuba Power Station (180km distance) or Tutuka Power Station (210km distance). The rail route from the Leslie 2 project area to Majuba Power Station runs east towards Ermelo, and then onto the newly constructed rail line that links the export rail line at Ermelo with Majuba Power Station. The rail haul route to Tutuka Power Station goes west from the project area to Springs, and from Springs south towards Durban. At Standerton, there is a rail link from the main Springs to Durban line to Tutuka Power Station.

4.2.2.5.2 Transportation by road (preferred alternative)

With this alternative, the product will be loaded onto road haul trucks and taken off-site via the R29 to Kriel Power Station (50km distance), Kendal Power Station (46km distance) and / or Tutuka Power Station (73km distance).

4.2.2.6 Other infrastructure

4.2.2.6.1 Offices, workshops and change houses

Based on the anticipated management structure for the proposed Leslie 2 project, office and ablution facilities were designed to accommodate all on-site personnel. The office design contains the reception area, eight offices, boardroom, male and female ablution facilities, kitchen, and change house.

The screening and crushing plant offices will be incorporated into the main office complex that is situated close to the plant.

An office complex, including offices, a small boardroom, a change house, stores, lamp room, and workshops will be established at the shaft / adit area.

A typical arrangement for underground operations is that all employees arrive at the underground adit and those working underground and at the surface infrastructure area, change into their working clothes in the change house prior to conducting their duties. On completion of their shifts, these workers will change out of their working clothes, shower, and dress in their clean clothes before departing from the mine.

At the surface coal processing plant area, the same will apply. The employees that work in the screening and crushing plant will change into their working clothes in the change house at the surface complex and conduct their duties. On completion of their shifts, these workers will change out of their working clothes, shower, and dress in their clean clothes before departing from the mine.

In order to reduce the environmental impact on the area, it is planned that all structures on the site will be of a pre-fabricated nature. The mine offices, workshops, and change houses will therefore be raised pre-fabricated structures specially adapted for these purposes. It will be easily removed at the end of the Life of Mine.

4.2.2.6.2 Construction (contractors) camp

The contractors camp at the shaft will be placed at the shaft office complex footprint. Once the contractors have completed the adit box cut, the decline shaft, and the fan installation, they will move off site and the offices, workshop and other buildings will be constructed on the same site, in order to limit the footprint size.

Similarly, the plant contractor will use an area in the the plant complex site for their camp site while constructing the plant and related infrastructure. The contractor establishing the office complex will also use an area inside the office complex footprint.

4.2.2.6.3 Adit and box cut

The total resource will be mined by means of underground mining using the conventional bord and pillar mining method deploying continuous miners with shuttle cars. The development of the underground mine will entail the construction of an adit, a decline shaft, three underground production sections, one underground stone development section and two ventilation shafts (see section 4.2.2.6.4 below).

As part of constructing the adit, an access box cut will provide access to the hard material from where the decline shaft will be developed to the coal seam.

Topsoil will be excavated from the access box cut area and taken to a designated topsoil stockpile by articulate dump trucks (ADTs). The topsoil stockpile will be grassed to protect it from erosion.

A surface drill will be used to loosen the underlying soft material. This soft material will then be excavated and removed from the adit by ADTs to be used in the construction of a Soft material shaft protection berm around the adit. A bulldozer will be used to do the spreading and leveling of the berm. The purpose of this berm will be to prevent run-off water from entering the adit and the underground works. The Soft material shaft protection berm will be compacted and wet on a daily basis to reduce dust emissions.

An electric face drill with a percussion head and blasting will be used to fragment the hard material during the construction of the decline shaft. The hard material will be used to create the ROM- and product stockpile pads.

Duration of excavating the adit will be three months and developing the decline shaft into the coal seams will be six months.

A box-cut and ramp layout layout is provided in Annexure A.

Information provided was applied by Blast Management and Consulting (refer to Annexure H8) in a design for the box-cut. Blasts were designed using JKSimblast blast simulation software and simulate the outcomes for specific aspects. The simulation of the blast in the software was then used to obtain the best prediction possible. Blast was designed and charged (according to expected drill depths over the full development of decline and bulk area). Standard timing of what can be expected was used and simulated. Figure 10 below shows the box-cut layout with blast holes.

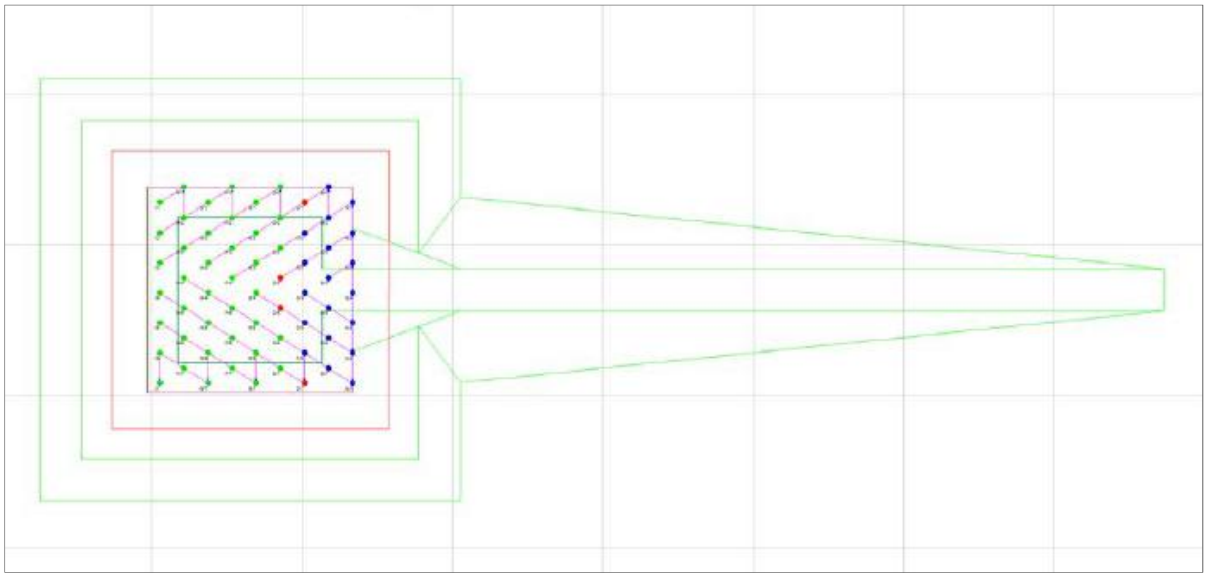

Figure 10: Box-cut blast holes layout (Blast Management and Consulting, 2016)

4.2.2.6.4 Ventilation Shaft

Table 9 below provides information on the proposed Ventilation Shaft. The up-cast and down-cast shafts will be raised bored. The down-cast shaft will be 6m high and the up-cast shaft 7m high. The fenced footprint area associated with the Ventilation shaft will be approximately 2 000m^2. The up-cast and down-cast shaft material will be stored underground.

Table 9: Up-cast ventilations shaft details

Depth from surface	110 m
Diameter of shaft air exit point	6.0 m
Air exit volume flow (m3/hr)	360,000 m^3/hour
Air exit velocity (m/s)	3.5 m/s
Air exit temperature (°C)	Approximately 25 C° wet bulb, 27.5 C° dry bulb

A typical fan layout is provided in Annexure A.

4.2.2.7 Power supply

4.2.2.7.1 Eskom power supply

Based on the planned mining operation, surface plant, and product handling information planned for the Leslie 2 project, the calculated Total Power Demand is 7.0 megavolt amperes (MVA). The Maximum Demand is dependent on correct operation of a Power Factor Correction (PFC) system to keep the Power Factor above 0.96. Should the PFC system fail, the Maximum Demand can substantially increase to 9.3 MVA.

Calculation of the Maximum Demand is based on:

- Underground power requirements
  - Three continuous miner sections;
  - Conveyor systems; and
  - Auxiliaries installations such as water reticulation systems.

- Surface power requirements
  - Office complexes;
  - Change house facilities;
  - Ventilation fans;
  - Incline conveyors;
  - Surface stockpile conveyors;
  - Crushing and screening plant;
  - Water purification and sewer plants; and

- Workshops.

As per the Anglo Operations (PTY) Ltd Leslie 2 Mining Works Programme, underground power requirements are based on past power measurements that were taken on similar mining operations for an operation of three continuous sections. Surface power requirements are based on experience from similar infrastructure.

Discussions with Eskom to provide power to Leslie 2 took place during the early stages of the project. Eskom indicated that the most likely point of power supply would be from the Leandra supply substation. An application for a 7 MVA supply has not yet been submitted, and will be submitted in future.[12] The Mining Works Programme indicates that Eskom must still complete its feasibility study for this option.

The preliminary power supply points for the Leslie 2 project (for information purposes) are indicated in Figure 11 below.

[12] A section of the proposed powerline will be located on farm portions situated in the Mpumalanga province and such application will thus be submitted to DMR: National Department as part of a separate process.

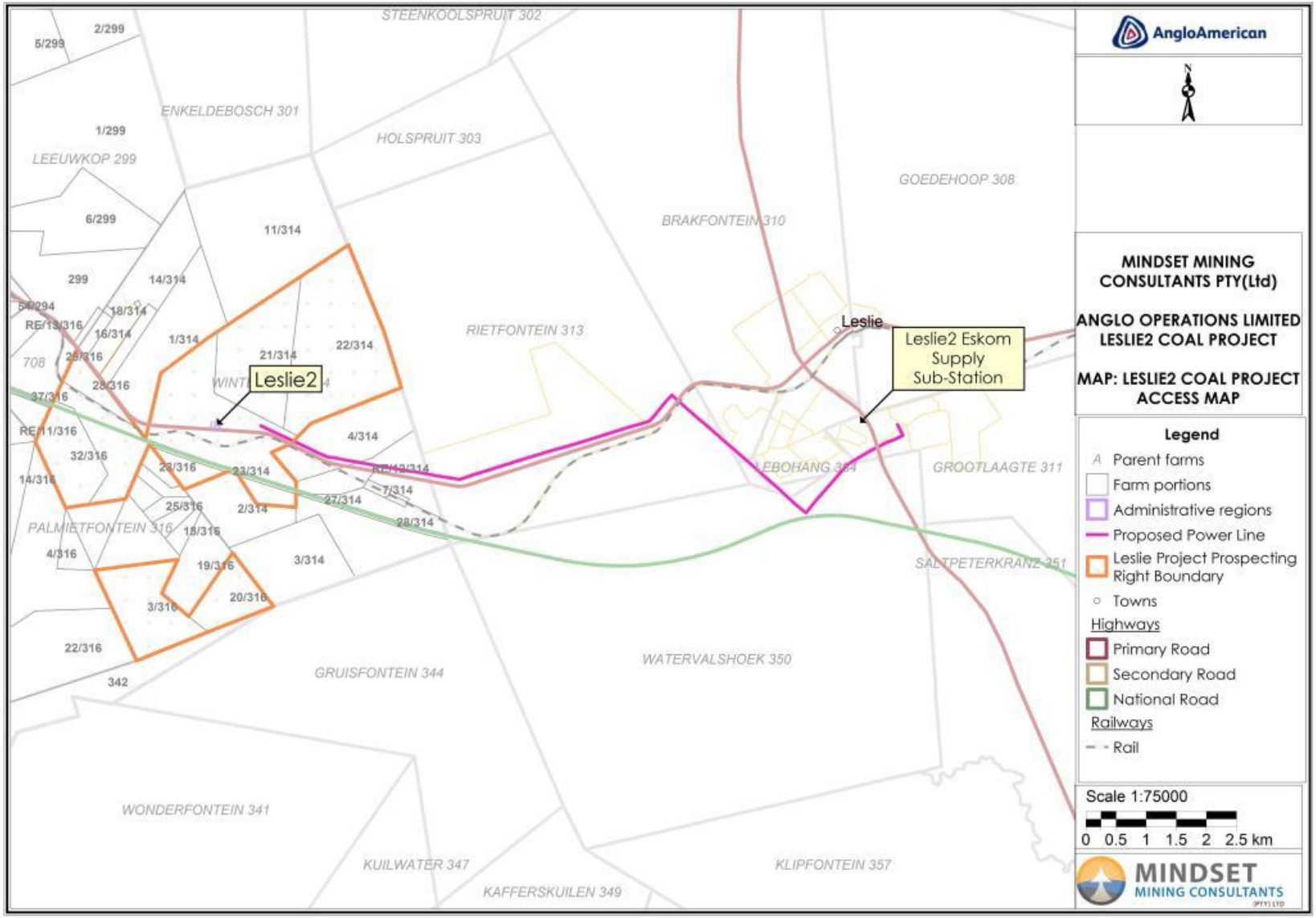

Figure 11: Proposed power supply points for Leslie 2 (Mindset Mining Consultants; 2016)

4.2.2.7.2 Power reticulation

As per the Mining Works Programme, a technical study is to be conducted to determine the following costs for the supply of power to Leslie 2:

- Estimated Eskom feasibility cost for a metred feeder bay supply point at Leandra.
- The overhead power line from the Eskom feeder bay to the consumer substation at Leslie 2. The location of the Leslie 2 consumer substation is indicated in Figure 6 above.
- The Consumer Substation at Leslie 2.

Supply to Leslie 2 is based on a 10.7 km, 22 kilovolts (Kv) (Wolf conductor) overhead power line. The load on the overhead power line will be 67 percent at 316 amperes (amp) for 7 MVA determined from the dynamic load flow calculations. Therefore, enough capacity is available for increasing the Maximum Demand to a maximum of one additional continuous miner section. A metering point will be included in the Leslie 2 consumer substation to reference the Eskom metering reading for account payment and reconciliation purposes.

The overhead power line servitude, crossing of national roads and farmer property rights will form part of the mentioned technical study.

Note: The proposed powerline has been excluded from the Environmental Authorisation application, and thus also this EIAR and EMPr. Refer to previous discussions above, as well as Tables 5 and 6[13]. A separate environmental authorisation application will be submitted for the mentioned powerline in future.

The Mine Health and Safety Act 29 of 1996 (MHSA) requires underground coal mines to have an alternative power supply source for critical installations, such as ventilation fans and pumping systems. Based on the Eskom infrastructure in the immediate area, duel feeds for 'fixed and firm' supply is not going to be possible in the timeframe catered for and the cost for an alternative supply from Eskom will not favour the feasibility of this Project (Mindset Mining Consultants; 2016). In order to mitigate risks to underground operations and to comply with legislation, Mindset Mining Consultants recommended the supply of alternate power to the ventilation fans, and indicated that other critical infrastructure is mitigated by installing standby diesel generators for the purposes of fulfilling the alternate power supply.

The Surface Consumer Substation for Leslie 2 will typically consist of the following:

- Pole-mounted Ganged Isolators with surge arrestors.
- Skid-mounted Oil Natural Air-cooled transformers fitted with:
  - Automatic 16-step tap switch changer

[13] A section of the proposed powerline will be located on farm portions situated in the Mpumalanga province and such application will thus be submitted to DMR: National Department as part of a separate process.

  - Primary circuit breaker
  - Secondary circuit breaker
  - 25-Amp dry-type continuously rated Neutral Earthing Resistor
  - Primary, secondary, transformer, and neutral earthing resistor protection
  - Controllers
  - Automatic tap switch changer
  - 22 kV voltage transformer
- One skid-mounted breaker skid with:
  - Two incoming breakers
  - One lighting transformer
  - Bus section breaker
  - Two reactor capacitor inductive system feeders
  - Two underground feeders
  - Four surface feeders
- Earthing system as per SANS requirements.
- Two PFC systems.

4.2.2.8 Water supply and management

4.2.2.8.1 Staff water requirements

Water requirements for use by the mine staff is calculated at 100 litres (L) per person per day. The total number of employees and subcontractors are estimated to be between 350 and 400 and the water supply capacity therefore has to be 40 kilolitres (Kl) per day.

The project geohydrological study and other studies conducted within the area indicate that the Vryheid Formation sandstones/shales are generally not good yielding aquifers and that exploitable quantities are generally only held in fractures. Although the matrix may store significant quantities of water, it can only be tapped if fractures are intersected during drilling. These fractures are generally encountered between 15 and 60 mbs. At depths greater than 60 m the presence of fractures generally decreases with meaningful groundwater yields being extremely rare.

Therefore, if geophysical methods are used to target these fractures the potable requirement of 40 Kl/d could be obtained from water supply boreholes.

The risk related to the use of groundwater for potable supply from boreholes include:

- Loss of resource.
  - Boreholes must be pump tested to determine aquifer properties and sustainable yields. This must be determined by a professional geohydrologist and must not be exceeded.

- Aquifer depletion and risk of lowering groundwater levels on neighbouring properties through the development of a cone of depression.
  - Geophysical methods must be used to site boreholes which should be pump tested to determine hydraulic properties and depression cones.
  - Boreholes must be sited and drilled so as not to impact on privately owned boreholes.

An alternative strategy for potable water requirements on the mine would be to tap into the existing Rand Water pipeline.

Borehole water should be obtainable fairly close-by and will require less capital and will be produced at lower operating cost than Rand Water supply (Mindset, 2016). Refer also to Section 7 (Part A) and Annexure F for the alternatives assessment.

Should boreholes be established for water supply, a small water treatment plant will be built at the mine to produce potable drinking water for employees.

4.2.2.8.2 Industrial water management and water reticultaion

No washing plant is planned for the proposed Leslie 2 project and only a screening and crushing plant for the ROM coal will be established. The requirements for industrial water will therefore be mainly for dust suppression methods on surface and underground, and for supply to the underground mining equipment.

The following figures represent the proposed water reticulation for the Leslie 2 project in both a wet and dry season scenario as well as a 1:100 year flood event that may occur during a 72 hour period. The function of the water reticulation diagram is to assess the proposed functionatlity of the proposed Leslie 2 project and to respresent flows based on information received. It is important to note that the water reticulation diagrams below only reflect estimated volumes as there are no information available at this stage for realistic representations for the proposed Leslie 2 project. The most conservative values for the respective project alternatives were used as input for the reticulation plan. Various assumptions and volume information from similar coal mining operations are used (refer to the Storm Water Management Plan attached in Annexure H3 for more information).

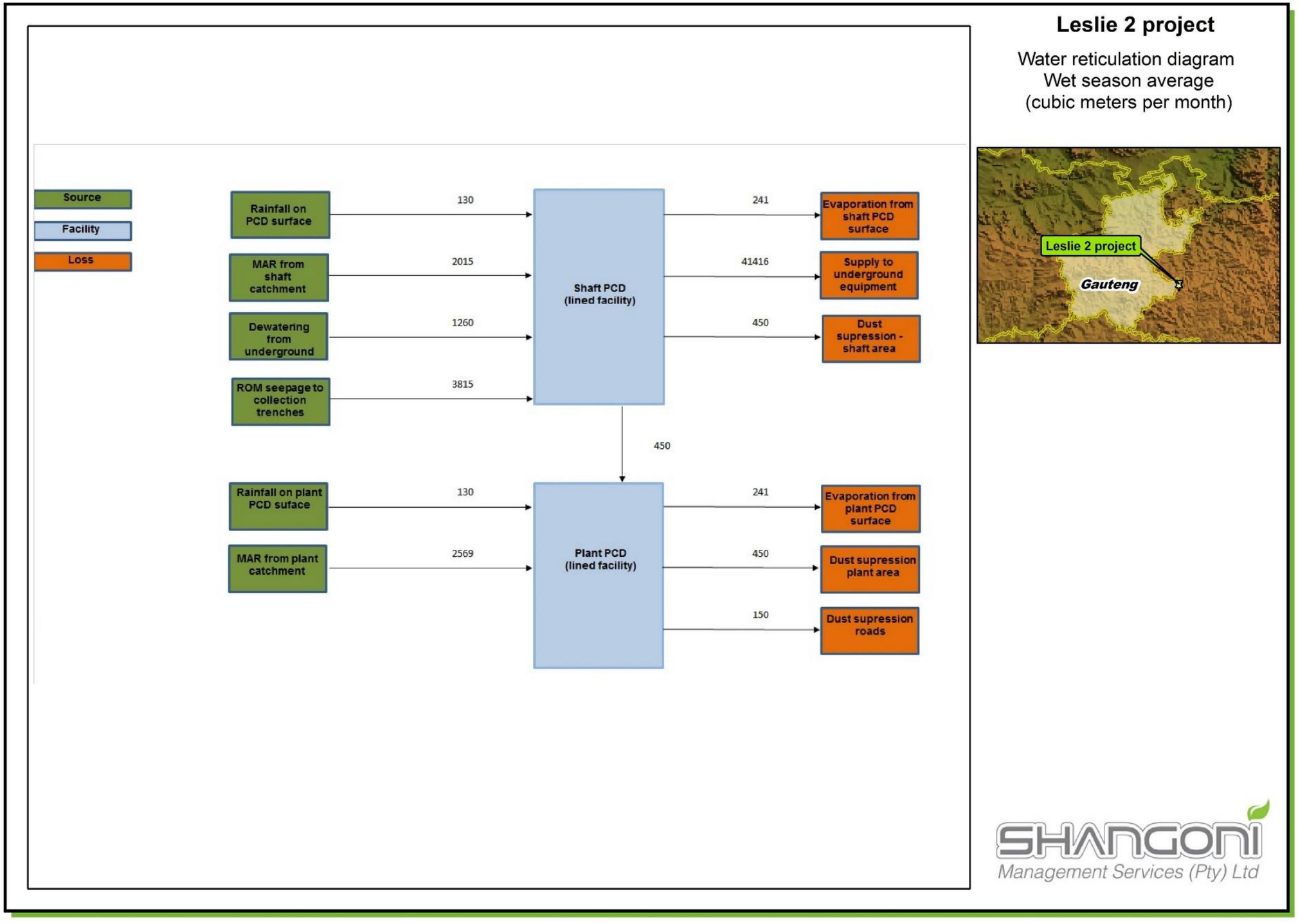

Figure 12: Water reticulation diagram - Wet season average

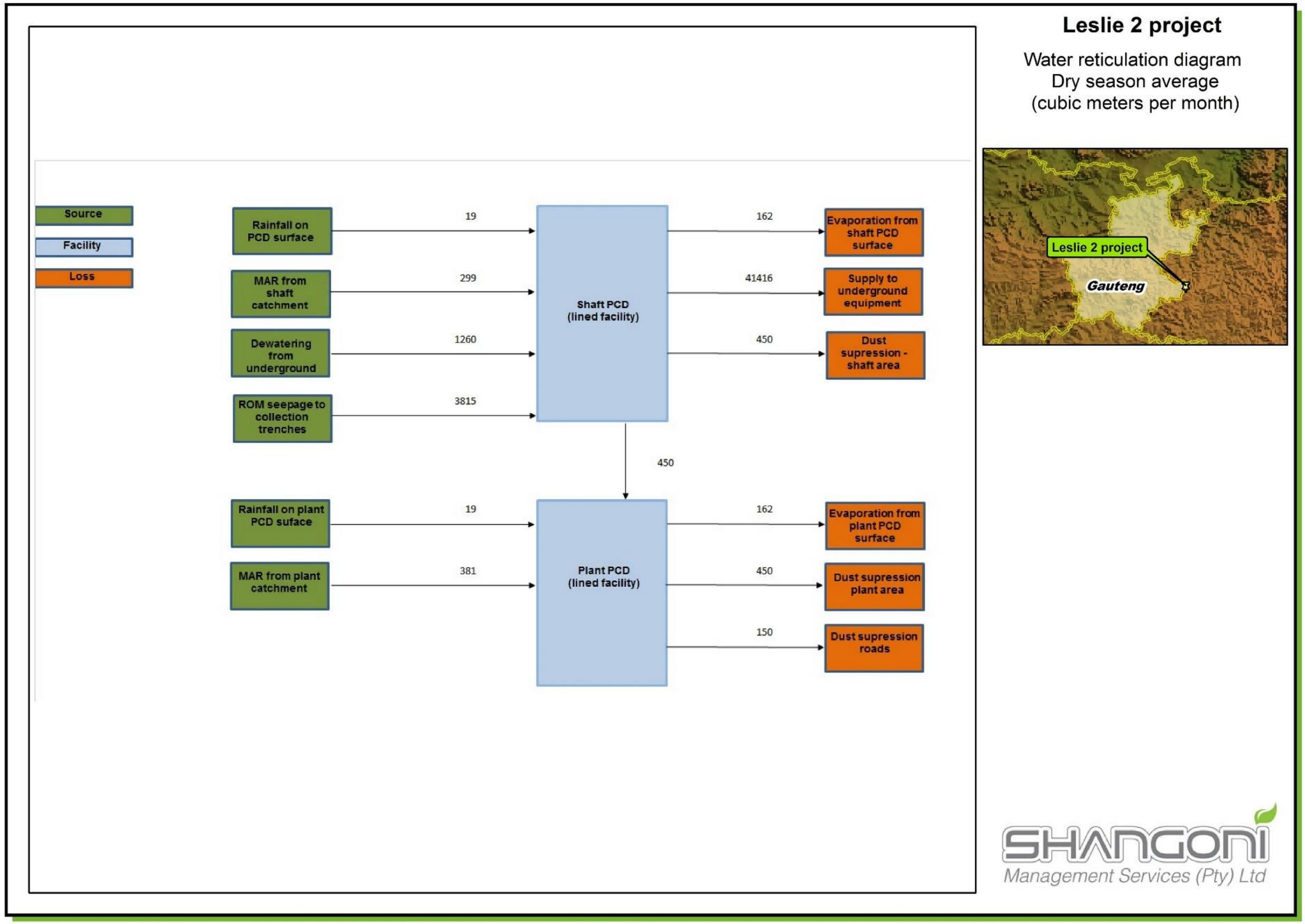

Figure 13: Water reticulation diagram - Dry season average

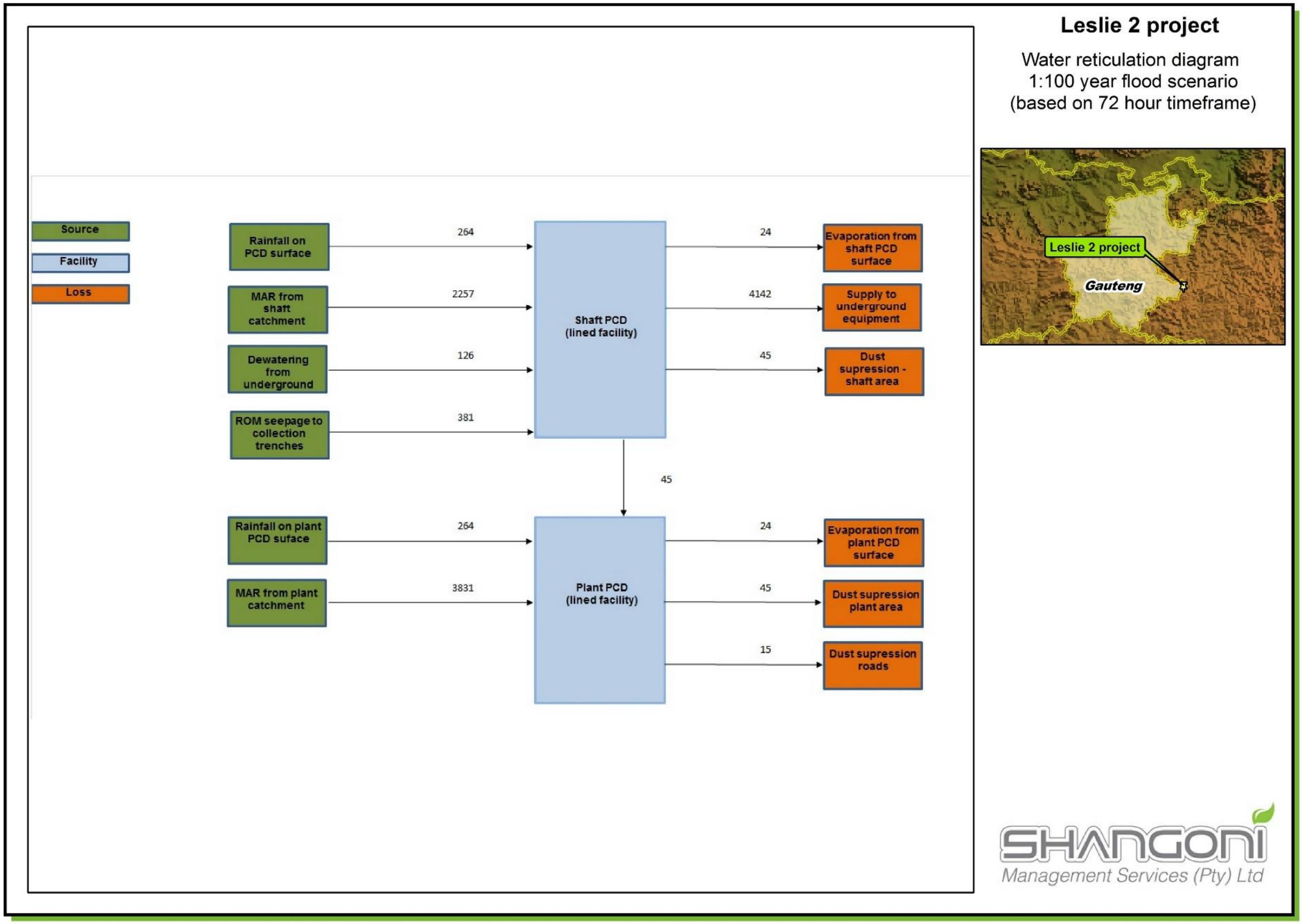

Figure 14: Water reticulation diagram – 1:100 year flood scenario (based on a 72 hour time period)

The two-respective wet and dry season water reticulation diagrams indicate that there might be a shortage of water to supply underground workings during the operational phase. An average groundwater recharge volume obtained from the geo-hydrological study was used for the reticulation plan. It is important to note that the recharge volume varies from 5 m^3 per day in year 1 to 79 m^3 per day in year 14. Additional water supply may need to be sourced for mining operations. As mentioned earlier, no sufficient data is available at this stage to represent a more realistic reticulation system for the Leslie 2 project. Average values were sourced from similar coal mining operations and used for the compilation of the diagrams. The surface area of the shaft- and plant pollution control dams were obtained from the infrastructure drawings provided. The capacity of the respective dams is not known at this stage and therefore could not be used to determine if sufficient storage capacity is available to contain the amount of affected runoff expected during a 1:100 year storm event. It is recommended that the reticulation plan be revised as soon as more accurate data is available for the mining operations.

4.2.2.8.3 Storm water management

A conceptual storm water management plan (SWMP) has been developed for the Leslie 2 project area. The purpose of the SWMP is to effectively manage the expected 1:50 year and 1:100-year flood volumes and to propose clean and dirty water separation measures to meet the requirements in accordance with the best practice guidelines (DWAF, 2006), Section 19 of the National Water Act and Regulation 704 (No. 704 of 4 June 1999) of the National Water Act (Act 36 of 1998). The storm water management plan proposes strategies applicable for the two plant infrastructure layout options and the proposed infrastructure for the shaft area. The plan is a high level strategic document presenting proposed practises with focus on storm water control measures to be implemented at the proposed Leslie 2 project. Refer to Figures 15 and 16 below for a representation of the proposed storm water management measures at the Plant- (alternative 2) (PL02) (preferred alternative) and Shaft Complex. Tables 10 and 11 provide a description of the proposed storm water management to be undertaken on-site.

Table 10: SWMP - Plant infrastructure Alternative 2 (PL02)

Reference number corresponding to Figure 15	Description of proposed storm water management measures
1 & 2	Infrastructure alternative 2 entails the construction of the plant and main office area on the northern side of the R29. Affected surface water runoff is expected to be generated from the plant feed stockpile and conveyor, plant, plant workshop and change-house, product stockpile, load stockpile and the coal haul road. During construction of the plant area, it is expected that the topography will be levelled to obtain a flat surface on which the proposed infrastructure is to be developed.

Reference number corresponding to Figure 15	Description of proposed storm water management measures
	Problem statement: Artificial levelling of surfaces to allow infrastructure development may cause undesired ponding of surface runoff within the operational areas. Exposure of clean rainfall to contaminants may result within the plant area and the coal load area. If not contained, affected runoff may enter the nearby clean water drainage lines. Siltation of storm water infrastructure is a continuous challenge at coal operations due to the generation of coal dust by the movement of vehicle and machinery. Recommendation: It is recommended to implement concrete lined drainage channels at the plant area to convey affected runoff generated on site towards the proposed silt and oil trap. The affected water contained during plant operations should be pumped to the proposed pollution control dam for re-use. The proposed pollution control dam should be a lined facility to limit seepage to underground resources. The water contained in the proposed pollution control dam will be used for dust suppression. The plant feed stockpile and the product stockpile should be placed on impermeable surfaces to avoid groundwater contamination through seepage and to comply with GN 704, Regulation 7(a). Regular maintenance should be conducted on all affected water infrastructure to ensure adequate capacity during, as a minimum, the expected 1:50 year flood event – GN 704, Regulation 6(c),(d)(f) and 7(a).
3	Clean surface water runoff is expected to drain towards the proposed plant area from the an eastern to a south-western direction during rainfall events. The runoff will follow the natural topography towards natural drainage lines in the area. Problem statement: Clean surface runoff may come into contact with contaminants within the plant area resulting in a decrease of surface water quality and the generation of affected runoff. Recommendation: It is recommended to implement diversion berms on the northern and southern boundary of the proposed plant area to prevent clean surface runoff from entering the plant area. The strategy aims to isolate the proposed plant area from the surrounding clean water area and to comply with GN 704, Regulation 6(a) & (b).

Reference number corresponding to Figure 15	Description of proposed storm water management measures
	The proposed berm will convey surface runoff towards the shaft access road and therefore investigations should be conducted to determine if a culvert will be needed to prevent scouring and erosion of the access road.
4	The main office and stores complex will be located on the western side of the proposed plant area as depicted by reference number 4 and will consist of prefabricated buildings that can be easily removed once operations stop. In terms of storm water pollution potential, the main office and stores complex is considered a low risk area. Good housekeeping practises should be applied within the area to avoid any concerns.
5	The mine proposes a coal load stockpile next to a proposed rail spur (if the rail transportation alternative is implemented). Coal will be loaded onto trains and will be transported on the main railway line. Problem statement: Surface water runoff may come in contact with the coal load stockpile and the general area where loading is to take place that may lead to a decrease in surface water quality and the generation of affected water runoff. Recommendation: It is proposed to construct a wall around the coal load stockpile and an impermeable surface on which the coal is to be stockpiled. Loading should also be limited to the impermeable surface to prevent groundwater contamination. The strategy aims to comply with GN 704, Regulation 7(a).

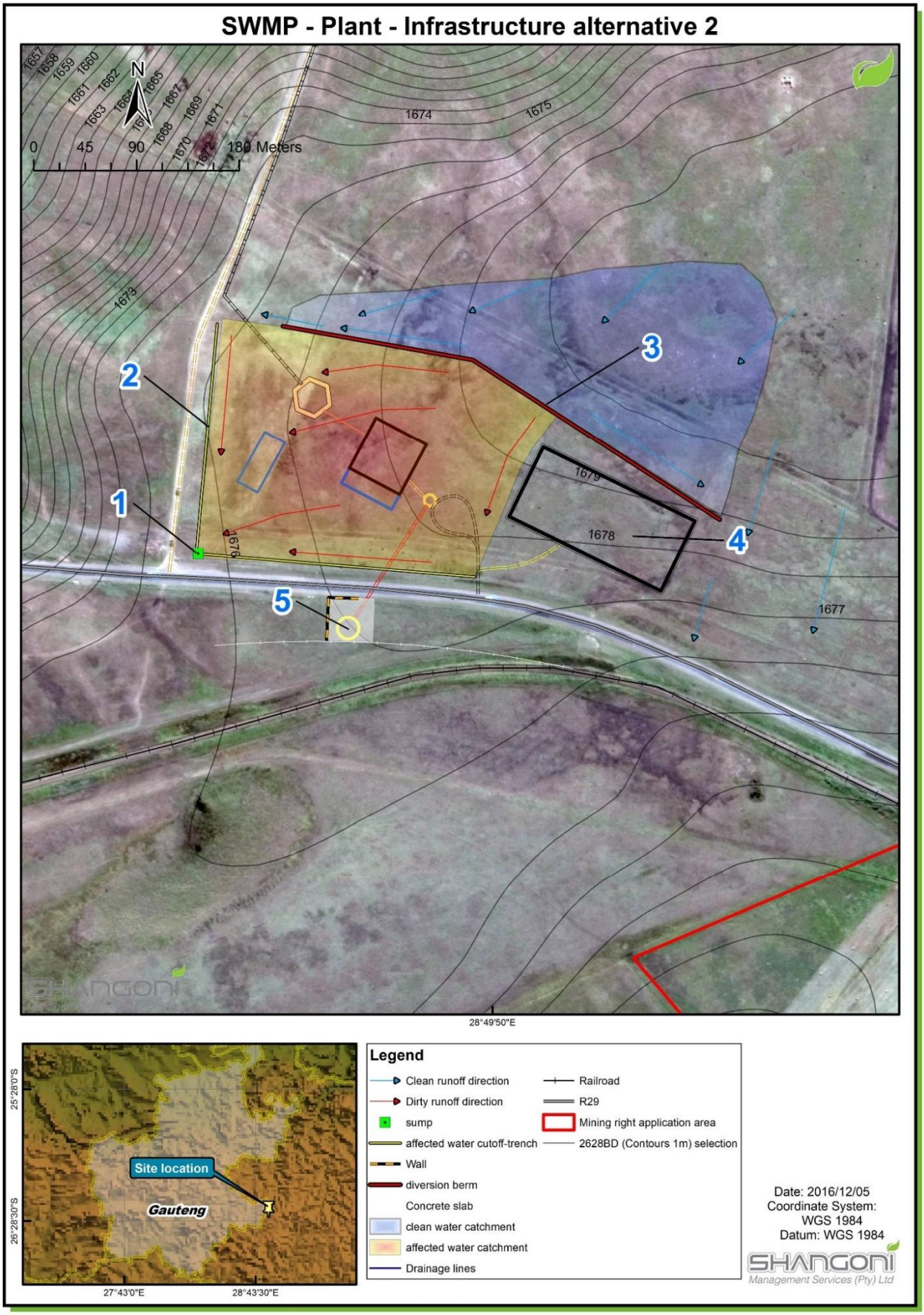

Figure 15: SWMP - Plant infrastructure alternative 2

Table 11: SWMP - Shaft infrastructure alternative 1 & 2

Reference number corresponding to Figure 16	Description of proposed storm water management measures
1,2 and 3	Affected surface water runoff is expected to be generated from the ROM stockpile and shaft conveyor. During construction of the shaft area, it is expected that the topography will be levelled to obtain a flat surface on which the proposed infrastructure is to be developed. An adit will be dug out that will form the decline shaft. Problem statement: Artificial levelling of surfaces to allow infrastructure development may cause undesired ponding of surface runoff within the operational areas. Storm water runoff may also enter the adit and flow towards the underground workings during heavy rainfall events. Surface runoff generated within the shaft area is considered affected water and should be contained and reused. The movement of vehicles and machinery within the shaft area generates coal dust that may lead to the siltation of storm water infrastructure which is a continuous challenge at coal operations. Recommendation: It is recommended to implement concrete lined drainage channels downstream of the shaft area to convey affected runoff generated on site towards the proposed silt and oil trap. The affected water contained during shaft operations should be pumped to the proposed pollution control dam for re-use. The proposed pollution control dam should be a lined facility to limit seepage to underground resources. As per the proposed mine operations, the water contained in the pollution control dam will be used for dust suppression and supply to underground workings. Regular maintenance should be conducted on all affected water infrastructure to ensure adequate capacity during, as a minimum, the expected 1:50 year flood event – GN 704, Regulation 6(c), (d), (f) and 7(a). It is also recommended to construct a berm around the decline shaft (adit) to prevent surface runoff ingress during rainfall events. Water flowing into the decline shaft should be captured at the bottom and pumped back for reuse – GN 704, Regulation 7(c).

Reference number corresponding to Figure 16	Description of proposed storm water management measures
4	Clean surface water runoff is expected to drain towards the proposed shaft area from a southern to a north-eastern direction during rainfall events. The runoff will follow the natural topography towards natural drainage lines in the area. Problem statement: Clean surface runoff may come into contact with contaminants within the shaft area that may result in a decrease in surface water quality and the generation of affected surface water runoff. Recommendation: It is recommended to implement diversion berms on the southern and north eastern boundary of the proposed shaft area to prevent clean surface runoff from entering the area. The strategy aims to isolate the proposed shaft area from the surrounding clean water area and to comply with GN 704, Regulation 6(a) & (b).
5	The shaft complex will be located on the western side of the proposed shaft area as depicted by reference number 5 and will consist of prefabricated buildings that can be easily removed once operations stop. In terms of storm water pollution potential, the main office and stores complex is considered a low risk area. Good housekeeping practises should be applied within the area to avoid any concerns.

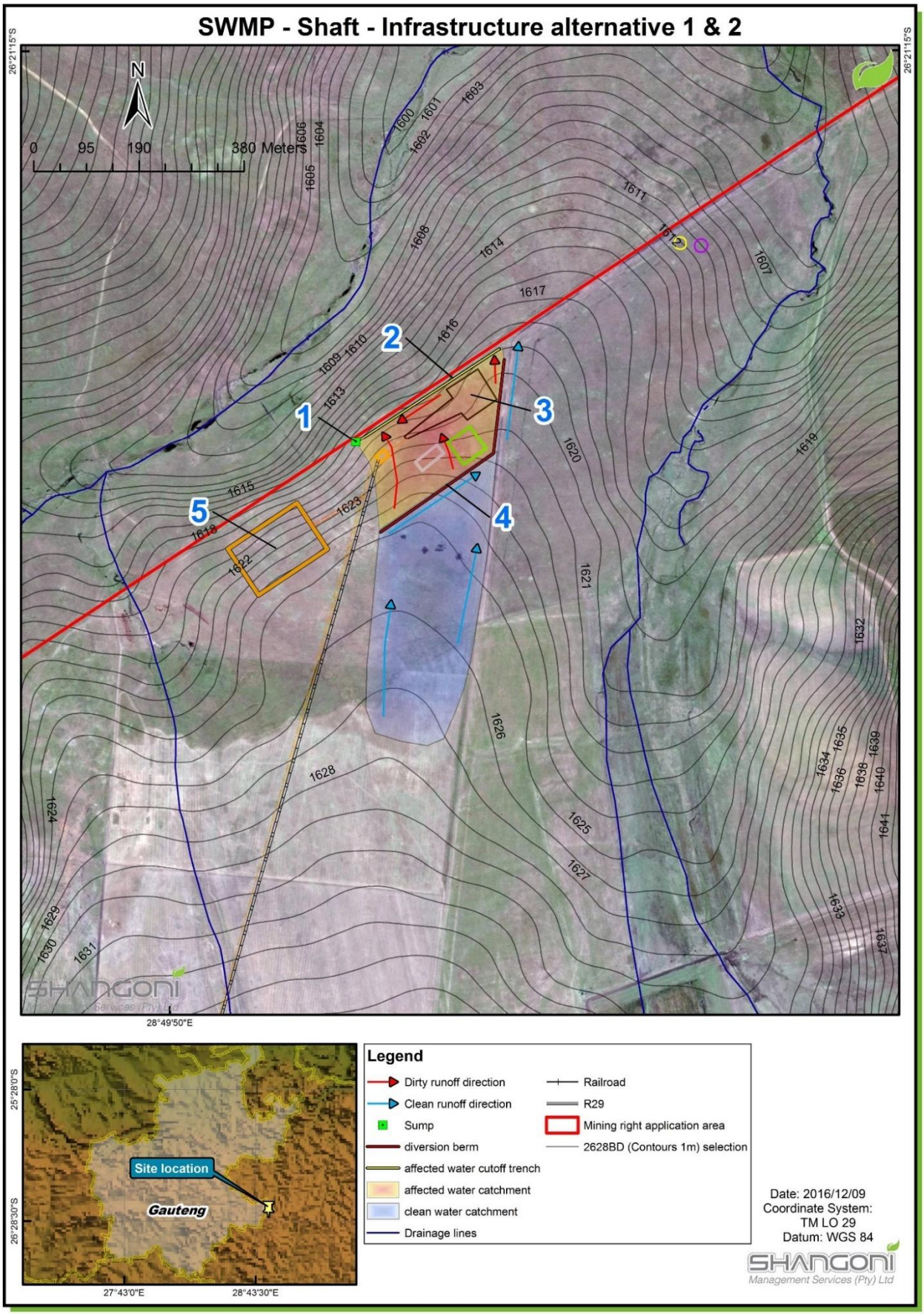

Figure 16: SWMP - Shaft infrastructure alternative 1 & 2

4.2.2.8.4 Domestic wastewater

It is proposed that septic tanks will be installed and used to manage domestic wastewater at the proposed Leslie 2 underground mine. The septic tanks will be located at, and form part of, the Plant- and Shaft complex footprints and will be maintained by a service provider.

4.2.2.9 Support services

Secondary support contracts will be concluded for certain services. These contracts are defined as those contracts that support the applicant in running the mine. Secondary service level contracts are shorter-term contracts of typically 12 months. These include, but are not necessarily limited to:

- Janitorial and grounds management services;
- Laboratory services;
- Medical and emergency response and occupational health and safety (OHS) support;
- Security services;
- Sewage and water treatment service (outsourced maintenance and monitoring contract); and
- Waste management services.

4.2.2.10 Non-mineral waste management

As mentioned above, a support contract will be undertaken with a waste management service provider for the management and handling of waste on-site as well as the removal of waste (general and hazardous) from the Leslie 2 project area.

Industrial waste from the Leslie 2 project area will be collected on a routine basis and sent to a waste storage and sorting yard (200m^2 in size), where it will be sorted, sold or removed for disposal. Used oils will be collected and recycled by a contractor. Hazardous waste will be removed from site by a licensed hazardous waste contractor to an appropriate and licenced hazardous waste disposal site. The management of industrial and hazardous waste will be undertaken in accordance with a documented waste management procedure.

Domestic waste will include, amongst others, general paper waste, food residue, glass and plastic bags and bottles (if any). Domestic waste from the various areas on the mine will be collected and disposed of at an appropriate general waste disposal facility. The management of general waste will be undertaken in accordance with a documented waste management procedure.

4.2.2.11 Operating hours

Construction Phase and adit excavation:

The construction phase (excluding the adit excavation) will be 8 hours per day, 5 days a week and 250 days per year (working hours will be 07:00 – 15:00). The adit excavation will be 24 hours per day, 7 days a week and 300 days per year (with 24 hours per day working hours).

Operational Phase:

The mine will run on a two by 9 hour shifts per day, five days per week for all production and plant staff. Working hours will be 06:00 to 15:00 for the morning shift and afternoon shift will be from 15:00 to 24:00. Office staff will work 8 hours per day five days per week. Working hours will be 07:00 to 16:00 with an hour lunch break.

4.2.3 Estimated reserves

The resource categorisation for each seam in terms of Measured, Indicated, and Inferred is shown in Table 12 below.

Table 12: Project resource classification

Category	Measured		Indicated		Inferred	
	GTIS[14] (Mt)[15]	%	GTIS (Mt)	%	GTIS (Mt)	%
4 Seam Select	-	-	-	-	40.71	100
2 Seam	-	-	-	-	46.38	100
Total	**-**	**-**	**-**	**-**	**87.09**	**100**

The resource statement for the proposed project is indicated in Table 13 below.

Table 13: Raw coal resource statement – Resources (air-dried)

Seam	GTIS (Tonnes)[16]	Geological Loss (%)	MTIS[17] (Tonnes)	CV (MJ/kg)	Ash (%)	VM (%)	IM (%)	TS (%)	FC (%)
4 Seam Select	40,710,207	25	30,532,655	18.49	33.88	21.23	4.09	0.61	40.81
2 Seam	46,376,226	25	34,782,169	17.78	37.10	20.70	3.68	0.64	38.53

[14] GTIS – Gross Tonnes In Situ

[15] Mt – Million Tonnes

[16] Tonne = 1,000 kilogrammes (kg) / 1 ton = 1,016 kg.

[17] MTIS – Mineable Tonnes In Situ

Seam	GTIS (Tonnes)[16]	Geological Loss (%)	MTIS[17] (Tonnes)	CV (MJ/kg)	Ash (%)	VM (%)	IM (%)	TS (%)	FC (%)
Total:	**87,086,433**		**65,314,825**						

4.2.4 Production rate and Life of Mine

As per the Mining Works Programme, the proposed Leslie 2 project will have a lifespan of approximately 16 years (inclusive of the construction period).

The mine has an estimated production life of 14 years, producing between 1.4 million tonnes per annum and 1.6 million tonnes per annum of the run of mine coal. The mine production will build-up over a period of 11 months, with full production in Year 02.

The Life of Mine (LoM) plan indicates that production will be consistent right up to end of the current 14-year mine planning. The 4 Seam Select will be depleted early in Year 14 from when only the 2 Seam will be mined up to the end of the project in Year 14.

The production build-up and forecast is shown in the Mining Works Programme in Annexure E.

The milestones timeframe (adapted from the Mining Works Programme) is provided in Table 14 below.

Table 14: Milestones timeframe

Activity	Timeframe
Submit mining rights application, environmental authorisation application and waste management licence application	Quarter 01, 2017
Receive Mining Right and Execute	Quarter 02, 2018
Issuing of Tender Requests for Adit and Shaft Development, Plant Construction, Mining Equipment, and Surface Buildings, Power and Water Supply, etc.	Quarter 03, 2018
Award Tenders	Quarter 02, 2019
Site Establishment and Preparation	Quarter 03, 2019
Establishment of Power, Water, and Access Roads	Quarter 03, 2019 to Quarter 02, 2020
Screening and Crushing Plant Construction	Quarter 03, 2020 to Quarter 01, 2021
Cut-off Drains, PCDs, Fencing, etc.	Quarter 03, 2019 to Quarter 02, 2020

Activity	Timeframe
Adit Establishment, Development of Two Decline Roadways and Raise Boring Upcast Shaft	Quarter 03, 2019 to Quarter 01, 2020
Installation of Shaft Conveyor and Power and Water Supply to Underground	Quarter 02, 2022 to Quarter 04, 2020
Shaft Bottom Development	Quarter 01, 2021
First Coal and Commissioning of Screening and Crushing Plant	Quarter 01, 2021
Steady-State Mining	Quarter 01, 2022

5. Policy and Legislative Context

Table 15: 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 instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED** (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT** (E.g. In terms of the National Water Act: - Water Use Licence has/has not been applied for).
The Constitution of the Republic of South Africa, 1996	Throughout this EIAR / EMPr	This project specific EIAR / EMPr is compiled in accordance with the MPRDA, 2002 and NEMA, 1998 as well as the Regulations there under.
The Mineral and Petroleum Resources Development Act 28 of 2002 as amended.		
The Mineral and Petroleum Resources Development Regulations GN R527 dated 2004.		
Environment Conservation Act 73 of 1989		
The National Environmental Management Act 107 of 1998 as amended.		
The Environmental Impact Assessment Regulations GN R982 dated 2014.		
The Environmental Impact Assessment Regulation. Listing Notice 1. GN R983 dated 2014.	Table 5	The triggered listed activities applied for are included in Table 4.
The Environmental Impact Assessment Regulation. Listing Notice 2. GN R984 dated 2014.		The triggered listed activities applied for are included in Table 4.

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 instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g. In terms of the National Water Act: - Water Use Licence has/has not been applied for).
The Environmental Impact Assessment Regulation. Listing Notice 3. GN R985 dated 2014.		
Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010. GN 891 of 2014.	Section 6 (Part A) of this EIAR/ EMPr.	The need and desirability of the project has been discussed in Section 6 below in terms of the required format contained in the Guideline on Need and Desirability (GN 891 of 2014).
Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector.	Chapters E, F and P of Section 7.4.1 (Part A) of this EIAR / EMPr and Annexures H2 and J.	In terms of the requirement regarding the management of biodiversity, the Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector was consulted in terms of the following principles and sections, as contained in the Guideline, and have been incorporated throughout this EIAR / EMPr: • Biodiversity information used in Section 7.4.1 include the relevant GIS maps and documents to plot the location of the mining site onto maps depicting critical biodiversity areas, flora, sensitive areas etc. Information was also sourced from SANBI; • The use of existing specialist studies and monitoring information in order to determine the impacts on the ecological sphere of the environment; and

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 instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g. In terms of the National Water Act: - Water Use Licence has/has not been applied for).
		• Biodiversity related impacts as well as impacts with regards to conservation planning and protected areas were assessed and are included in Section 9 (Part A) and Annexure J.
The National Water Act 36 of 1998 (NWA) as amended. .	Section 4.2.2.6 and Chapters G, H and J of Section 7.4.1 (Part A) of this EIAR / EMPr and Annexures H3, H4, and H5.	Refer to Annexure H3 for the Storm Water Management Plan. A Water Use Licence has not yet been applied for as yet.
GN 704 dated 1999 under the NWA.		
The National Environmental Management: Biodiversity Act 10 of 2004 as amended.	Chapter E, F and P of Section 7.4.1 (Part A) of this EIAR / EMPr as well as Annexure H2.	Impacts and mitigation / management measures relevant to biodiversity and conservation are provided in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
National Forests Act 84 of 1998		
Alien and Invasive Species Regulations GN R598 dated 2014		
Conservation of Agricultural Resources Act 43 of 1983 (CARA)		
The National Environmental Management: Air Quality Act 39 of 2004 as amended.	Chapter K of Section 7.4.1 (Part A), Section 9 (Part A) and Section 1.4.9 (Part B) of this EIAR / EMPr.	Refer to the Air Quality Impact Assessment in Annexure H6.

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 instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g. In terms of the National Water Act: - Water Use Licence has/has not been applied for).
SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication. SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments.	Chapter L of Section 7.4.1 of this EIAR / EMPr.	Refer to the Environmental Noise Impact Assessment in Annexure H7.
National Environmental Management: Waste Act 59 of 2008 as amended.	Sections 4.2.2.3; 4.2.2.7 and 9.9 of this EIAR / EMPr.	The application related to this EIAR / EMPr also includes an application for a waste management licence. Refer to Table 4. Impacts and mitigation / management measures relevant to waste management are provided in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
National Heritage Resources Act 25 of 1999 as amended.	Chapter Q of Sections 7.4.1 of this EIAR / EMPr.	Refer to the Heritage Impact Assessment in Annexure H11 and the Palaeontological Impact Assessment in Annexure H12.
DMR Guideline for Consultation with communities and Interested and Affected Parties. As required in terms of Sections 16(4)(b) or 27(5)(b) of the MPRDA, and in	Sections 7.3 and 11 of Part A this EIAR / EMPr and Annexure G.	Public Participation relevant to this EIAR / EMPr has been undertaken in accordance with the relevant Guideline(s) and EIA

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 instruments that are applicable to this activity and are to be considered in the assessment process)	REFERENCE WHERE APPLIED (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g. In terms of the National Water Act: - Water Use Licence has/has not been applied for).
accordance with the standard directive for the compilation thereof as published on the official website of the Department of Mineral Resources.		Regulations, dated December 2014. Refer to the Public Participation Report in Annexure G.
Integrated Environmental Management Information Series. Criteria for determining alternatives in EIA.	Sections 7.1, 7.4, 7.7 and 7.9 of this EIAR / EMPr and Annexure F.	Alternatives have been assessed as part of the Scoping and EIA phases. Refer to Annexure F.
Gauteng Provincial Environmental Management Framework (EMF), dated November 2014	Section 6 (Part A) (below) and Chapters P and R of Part 7.4.1 of this EIAR / EMPr. Refer also to Annexures H2.	Impacts and mitigation / management measures relevant to biodiversity and conservation as well as socio-economic aspects are provided in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
Gauteng Spatial Development Framework (SDF); dated July 2011		
Gauteng Conservation Plan, Version 3.3		
Sedibeng District Municipality Integrated Development Plan (IDP), 2016-17		
Sedibeng District Municipality Draft Spatial Development Framework (SDF), 2014 - 2017		
Lesedi Local Municipality Draft Integrated Development Plan (IDP), 2016/17		

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 instruments that are applicable to this activity and are to be considered in the assessment process)	**REFERENCE WHERE APPLIED** (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	**HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT** (E.g. In terms of the National Water Act: - Water Use Licence has/has not been applied for).
Lesedi Local Municipality Solid waste bylaws, published under LAN 1604 in Gauteng Provincial Gazette 408 of 15 September 2015.	Section 4.2.2 and Section 9 (Part B) of this EIAR / EMPr. Refer also to Part B of this EIAR / EMPr.	Impacts and mitigation / management measures are provided in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr. National and provincial legislation and bylaws have been taken into consideration as part of the mitigation / management measures.
Lesedi Local Municipality Bylaws enacted in terms of the National Building Regulations and Building Standards Act and Empowered by the Municipal Systems Act (Building By-law), published under LAN 1602 in Gauteng Provincial Gazette 408 of 15 September 2015.		
Lesedi Local Municipality. Provincial Notice 76 of 2016. Spatial Planning and Land Use Management By-law, 2015.		
Government Gazette 39425. Government Notice R.1147 dated 2015, "*Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations*"	Section 19 (Part A) and Sections 1.4.1 and 1.7 (Part B) of this EIAR / EMPr, as well as Annexure K.	The Closure Cost Assessment (financial provision) report, as well as the Rehabilitation Plan / Schedule and Closure- and Decommissioning Plan have been compiled for the Leslie 2 Project in terms of the mentioned Regulations. Refer to Annexure K.

6. Need and desirability of the proposed activities

6.1 Need and Desirability in terms of the Guideline on Need and Desirability, dated 20 October 2014.

On the 20th of October 2014, the Department of Environmental Affairs published a Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010, in Government Notice 891 of 2014. The following table indicates on how the guideline requirements were considered in this EIR/EMPr.

Table 16: Need and Desirability of the Proposed Project

Requirement	Part where requirement is addressed/response
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?[18]	
1.1 How were the following ecological integrity considerations taken into account?	Refer to Chapters E, F and P of Section 7.4.1 (Part A) of this EIAR / EMPr. Flora, fauna and wetland assessments have been conducted for the Leslie 2 Project. Refer to Annexures H2 and H4.
1.1.1 Threatened Ecosystems.[19]	
1.1.2 Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.[20]	
1.1.3 Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs").	Refer to Chapter P of Section 7.4.1 of this EIAR / EMPr.
1.1.4 Conservation targets.	
1.1.5 Ecological drivers of the ecosystem.	
1.1.6 Environmental Management Framework.	
1.1.7 Spatial Development Framework.	

[18] Section 24 of the Constitution and section 2(4)(a)(vi) of NEMA refer.

[19] Must consider the latest information including the notice published on 9 December 2011 (Government Notice No. 1002 in Government Gazette No. 34809 of 9 December 2011 refers) listing threatened ecosystems in terms of Section 52 of National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).

[20] Section 2(4)(r) of NEMA refers.

Requirement		Part where requirement is addressed/response
1.1.8	*Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).*[21]	On 4 May 2007 the Minister of Environmental Affairs and Tourism formally declared the eastern part of Gauteng and western part of Mpumalanga an air pollution hotspot, to be known as the "The Highveld Priority Area", a National air pollution hotspot in terms of Section 18(1) of the NEM:AQA. By declaring a priority area, authorities recognise that air quality within these areas are generally regarded as being poor, and frequently meet or exceed ambient air quality standards. The proposed Leslie 2 project area is located in the Highveld Priority Area. This implies that authorities may impose measures on the mine and other mines and industries within this area in order to allow for improvements in the air quality of the region.
1.2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?[22]	Impacts and mitigation / management measures are provided in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
1.3	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?[23]	
1.4	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether,	Refer to Parts 4.2.2.3 and 4.2.2.7.

[21] Section 2(4)(n) of NEMA refers.

[22] Section 24 of the Constitution and Sections 2(4)(a)(i) and 2(4)(b) of NEMA refer.

[23] Section 24 of the Constitution and Sections 2(4)(a)(ii) and 2(4)(b) of NEMA refer.

	Requirement	Part where requirement is addressed/response
	what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?[24]	
1.5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?[25]	A Heritage Impact Assessment (AIA) was conducted during the EIA Phase of the project. Refer to Chapter Q of Sections 7.4.1 of this EIAR / EMPr and Annexure H11.
1.6	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?[26]	The mining and removal of minerals (non-renewable resources) at the proposed Leslie 2 project area will result in the localised destruction of the geological strata, which is a consequence of mining. Water from the underground mining areas will be dewatered (for the safe continuation of mining) and pumped to the dirty water management system of the mine. The potential impacts that may occur as a result of the proposed activity have been identified and discussed in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
1.7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?[27]	

[24] Section 24 of the Constitution and Sections 2(4)(a)(iv) and 2(4)(b) of NEMA refer.

[25] Section 24 of the Constitution and Sections 2(4)(a)(iii) and 2(4)(b) of NEMA refer.

[26] Section 24 of the Constitution and Sections 2(4)(a)(v) and 2(4)(b) of NEMA refer.

[27] Section 24 of the Constitution and Sections 2(4)(a)(vi) and 2(4)(b) of NEMA refer.

Requirement	Part where requirement is addressed/response
1.7.1 Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	Since the proposed Leslie 2 Project will be a new mining operation, the dependency on the use of the resources will be increased.
1.7.2 Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)	
1.7.3 Do the proposed location, type and scale of development promote a reduced dependency on resources?	
1.8 How were a risk-averse and cautious approach applied in terms of ecological impacts?[28]	A risk-averse and cautious approach was applied during the Scoping Phase in terms of the identification of specialist studies to be undertaken. Similarly, a conservative approach was followed in terms of the identification and assessing of environmental impacts associated with the proposed project during the EIA / EMPr phase.
1.8.1 What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Refer to Section 15 of this EIAR / EMPr.
1.8.2 What is the level of risk associated with the limits of current knowledge?	A full list of specialist studies was undertaken for the project. All specialist risk ratings are based on a conservative approach.
1.8.3 Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
1.9 How will the ecological impacts resulting from this development impact on people's environmental right in terms following:[29]	

[28] Section 24 of the Constitution and Section 2(4)(a)(vii) of NEMA refer.

[29] Section 24 of the Constitution and Sections 2(4)(a)(viii) and 2(4)(b) of NEMA refer.

Requirement	Part where requirement is addressed/response
1.9.1 Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The potential impacts that may occur as a result of the proposed activity have been identified and discussed in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
1.9.2 Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	
1.10 Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	
1.11 Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	
1.12 Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?[30]	Refer to Annexure F. Infrastructure have been moved out of ecological sensitive areas and freshwater systems as part of Plant Location Alternative 02 and Ventilation Shaft Location 02.
1.13 Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?[31]	The potential impacts that may occur as a result of the proposed activity have been identified and discussed in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr. Refer also to Annexure J.
2.1 What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
2.1.1 The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other	Refer to Chapter P and R of Section 7.4.1 (Part A) of this document.

[30] Section 2(4)(b) of NEMA refer.

[31] Regulations 22(2)(i)(i), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer.

Requirement		Part where requirement is addressed/response
	strategic plans, frameworks of policies applicable to the area,	The potential impacts that may occur as a result of the proposed activity have been identified and discussed in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
2.1.2	*Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),*	
2.1.3	*Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and*	
2.1.4	*Municipal Economic Development Strategy ("LED Strategy").*	
2.2	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	
2.2.1	*Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?*	
2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?[32]	Refer to Chapter R of Part 7.4.1 of this EIAR / EMPr and Annexures I and H13.
2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term?[33] Will the impact be socially and economically sustainable in the short- and long-term?	The potential impacts that may occur as a result of the proposed activity have been identified and discussed in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
2.5	In terms of location, describe how the placement of the proposed development will:[34]	-
2.5.1	*result in the creation of residential and employment opportunities in close proximity to or integrated with each other,*	Residential opportunities are not anticipated to be created. The proposed activity will not impact on the transportation of people.
2.5.2	*reduce the need for transport of people and goods,*	
2.5.3	*result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the*	

[32] Section 2(2) of NEMA refers.

[33] Sections 2(2) and 2(4)(c) of NEMA refers.

[34] Section 3 of the Development Facilitation Act, 1995 (Act No. 67 of 1995) ("DFA") and the National Development Plan refer.

Requirement	Part where requirement is addressed/response
development result in densification and the achievement of thresholds in terms public transport),	
2.5.4 compliment other uses in the area,	The impact on the economic and social nature and well-being of the surrounding area (as a result of the Leslie 2 operation) has been assessed by social and economic specialists during the EIA Phase. Refer also to Annexures H13 and H14.
2.5.5 be in line with the planning for the area,	
2.5.6 for urban related development, make use of underutilised land available with the urban edge,	
2.5.7 optimise the use of existing resources and infrastructure,	
2.5.8 opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	
2.5.9 discourage "urban sprawl" and contribute to compaction/densification,	
2.5.10 contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	
2.5.11 encourage environmentally sustainable land development practices and processes,	Effective environmental management and mitigation of environmental impacts. Refer to Part B.
2.5.12 take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	The location of the proposed Leslie 2 project area was determined based on the location of the ore reserve. Refer to Annexure F for other alternatives identified and assessed.
2.5.13 the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	Refer to Annexure J.
2.5.14 impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	The impact on the economic and social nature and well-being of the surrounding area (as a result of the Leslie 2 operation) has been by social and economic specialists during the EIA Phase.
2.5.15 in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	A conservative approach was followed in terms of the identification and assessing of environmental impacts associated with the proposed project.

Requirement		Part where requirement is addressed/response
2.6	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?[35]	
2.6.1	*What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?[36]*	Refer to Section 15 of this EIAR / EMPr. A full list of specialist studies was undertaken for the project. All specialist risk ratings are based on a conservative approach.
2.6.2	*What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?*	
2.6.3	*Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?*	
2.7	How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	-
2.7.1	*Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?*	The impact on the economic and social nature and well-being of the surrounding area (as a result of the Leslie 2 operation) has been assessed by social and economic specialists during the EIA Phase.
2.7.2	*Positive impacts. What measures were taken to enhance positive impacts?*	
2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?[37]	Refer to Annexure F for the Alternatives Assessment Report.
2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall	

[35] Section 2(4)(a)(vii) of NEMA refers.

[36] Section 24(4) of NEMA refers.

[37] Section 2(4)(b) of NEMA refers.

Requirement		Part where requirement is addressed/response
	not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)?[38] Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?[39]	Refer to point 2.6 (of this table) above.
2.12	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?[40]	The potential impacts that may occur as a result of the proposed activity have been identified and discussed in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.
2.13	What measures were taken to:	-
2.13.1	*ensure the participation of all interested and affected parties,*	Refer to the Public Participation report attached hereto as Annexure G.
2.13.2	*provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,[41]*	
2.13.3	*ensure participation by vulnerable and disadvantaged persons,[42]*	
2.13.4	*promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,[43]*	

[38] Section 2(4)(c) of NEMA refers.
[39] Section 2(4)(d) of NEMA refers.
[40] Section 2(4)(e) of NEMA refers.
[41] Section 2(4)(f) of NEMA refers.
[42] Section 2(4)(f) of NEMA refers.
[43] Section 2(4)(h) of NEMA refers.

Requirement	Part where requirement is addressed/response
2.13.5 ensure openness and transparency, and access to information in terms of the process,[44]	
2.13.6 ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge[45]*, and*	
2.13.7 ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?[46]	Refer to the Public Participation report attached hereto as Annexure G. The Public Participation report presents the details of all I&APs that were identified, how the I&APs were notified and involved in the process, any issues and concerns raised by the I&APs and the latest results of the Public Participation Process.
2.14 Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?[47]	Refer to Annexure J.
2.15 What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?[48]	All contractors, sub-contractors and workers will attend compulsory environmental awareness training and inductions. This training will highlight the dangers associated with the workplace. Procedures relating to environmental risks will also be put in place and will be regularly updated.
2.16 Describe how the development will impact on job creation in terms of, amongst other aspects:	-
2.16.1 the number of temporary versus permanent jobs that will be created,	Refer to Annexure J.

[44] Section 2(4)(k) of NEMA refers.
[45] Section 2(4)(g) of NEMA refers.
[46] Section 2(4)(q) of NEMA refers.
[47] Section 2(4)(g) of NEMA refers.
[48] Section 2(4)(j) of NEMA refers.

Requirement	Part where requirement is addressed/response
2.16.2 whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	
2.16.3 the distance from where labourers will have to travel,	
2.16.4 the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	
2.16.5 the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	
2.17 What measures were taken to ensure:	-
2.17.1 that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	Refer to the Public Participation report attached hereto as Annexure G. Other government departments are included on the list of I&APs and stakeholders and received the notifications of the proposed activity as well as notifications on the availability of the reports for review. The applicable environmental legislation was considered during the EIA Phase.
2.17.2 that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	
2.18 What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?[49]	During the initial Public Participation Process, all issues and concerns raised by the I&APs, stakeholders and the Organs of State are taken into account and responses provided.
2.19 Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?[50]	The proposed mitigation measures are considered realistic to protect both the bio-physical and socio-economic environment in both the short- and long-term.
2.20 What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?[51]	The applicant will be responsible for the costs of any remediation of pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects. Refer to Annexure K.

[49] Section 2(4)(o) of NEMA refers.

[50] Section 240(1)(b)(iii) of NEMA and the National Development Plan refer.

[51] Section 2(4)(p) of NEMA refers.

Requirement		Part where requirement is addressed/response
2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?[52]	Refer to Annexure F for a detailed description of the method utilised in assessing the alternatives for the proposed project.
2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?[53]	The potential impacts that may occur as a result of the proposed activity have been identified and discussed in Sections 9; 10; 11; 12 of Part A and Sections 1.4; 1.5 and 1.6 of Part B of this EIAR / EMPr.

[52] Section 2(4)(b) of NEMA refers.

[53] Regulations 22(2)(i)(i), 28(1)(g) and 31(2)(1) in Government Notice No. R. 543 refer.

7. Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.

7.1 Details of the development footprint alternatives considered

7.1.1 Proposed activity

The proposed activity is that of underground coal mining and related activities at the proposed Leslie 2 operation.

7.1.2 Activity alternative

7.1.2.1 Mining method alternatives

Two alternatives in terms of mining method have been identified. These include:

- MM 1: Opencast (surface) mining methods; and
- MM2: Underground mining method (board and pillar).

The following were taken into consideration when the mining methods were initially considered for the proposed Leslie 2 mining area:

- Shape of the resource blocks;
- Depth, thickness, and distribution of the coal seams;
- Thickness of the coal seams;
- Parting thickness between the seams;
- Mining strip ratio;
- Quality of the coal;
- Potential markets;
- Potential price for the coal;
- Capital required to establish the mine; and
- Cost of mining.

Due to the very high strip ratio over the total area, and the 4 Seam Select and 2 Seam being too deep over the total area to mine economically by surface (opencast) mining methods, underground mining (MM2) was confirmed as the preferred method by the applicant from a technical and economical perspective.

A further alternatives assessment was also conducted from an environmental, technical and socio-economic perspective, and all aspects were considered in terms of comparing the two mining methods.

From an environmental perspective, underground mining was still identified as the preferred option, as opencast mining would pose a higher impact on environmental aspects, such as air quality, flora, fauna, soil, land use and land capability, sensitive landscapes, surface water, visual (including sense of place) and heritage resources.

Therefore, MM2 (underground mining) is the preferred alternative.

Table 17: Comparative review – Activity Alternatives (mining method)

	MM1: Opencast Mining	MM2: Underground Mining
Environmental	33.33%	58.33%
Social	33.33%	50.00%
Technical	57.41%	51.85%
Economic	33.33%	56.67%
FINAL SCORE	**39.35%**	**54.21%**

7.1.2.2 Market and process alternatives

A market analysis was conducted to determine the potential markets for the coal to be produced from the Leslie 2 project.

The following three market options were investigated:

- MA1: Producing a washed Eskom 24 percent Ash and less than (<) one percent Sulphur product;
- MA2: Producing a raw 20 MJ/kg, 30 percent Ash, < one percent Sulphur Eskom product; and
- MA3: Producing a 15 percent Ash export product.

The factors listed below informed the decision to select alternative MA2 as the favoured approach for the Leslie 2 project:

- The price for the 15 percent Ash export coal has reduced significantly,
- The yield for a 15 percent Ash product is too low to produce this export product at a cost that is economically viable.
- Mining and blending the 4 Seam Select and 2 Seam produces a consistent product with a CV of + 20 MJ/kg, Ash below 30 percent, and the Sulphur content below one percent. This product can be supplied to Eskom (opencast coal replacement) Power Stations.
- Producing a raw crushed product eliminates the need for a discard dump, which significantly reduces the dirty area footprint and the environmental impact.

- For both MA1 and MA3, the capital expenditure will be substantially higher due to the cost of a washing plant, the discard dump base, and a larger Pollution Control Dam (PCD) associated with the product requirements for MA1 and MA3; and
- The construction and operation of a washing plant and larger PCD will also have a higher environmental impact in terms of soil, land use and land capability, flora and fauna in terms of site clearance and potential impacts on sensitive landscapes.

The Geological Report (as per the Mining Works Programme) indicates that a high Ash, medium Volatile, thermal coal product for power station consumption could be produced by screening and crushing the run of mine (ROM) coal. Due to the preferred market alternative being MA2 (i.e. to supply an Eskom 20.0 MJ/kg product), the processing option of crushing and screening is the preferred processing alternative.

Table 18: Comparative review – Market and process alternatives

	MA1: Washed Eskom Product	MA2: Raw Eskom Product	MA3: Export Product
Environmental	49.31%	82.64%	49.31%
Social	50.00%	83.33%	50.00%
Technical	46.30%	87.04%	46.30%
Economic	33.33%	100.00%	33.33%
FINAL SCORE	**44.73%**	**88.25%**	**44.73%**

7.1.3 Transport alternatives

As per the Leslie 2 Project Mining Works Programme, the coal product will be fed onto the product stockpile, from where it will be loaded onto rail or road wagons for hauling / transporting to the power stations.

Therefore, the three alternatives in terms of the transporting of the product to the power stations are the following:

- TA1: Hauling via road;
- TA2: Transporting via rail; and
- TA3: Combination of road and rail.

From the Land Trade-Off Study and Macro Economic Impact Analysis conducted by Mosaka Economic Consultants (refer to Annexure H14 of the EIAR / EMPr), the results for the road transport option shows that, if expressed in economic prices, the Cost Benefit Analysis (CBA) provides very positive answers for all three prices. However, if expressed in terms of financial prices the R350 per ton provides negative

answers while the R375 and R400 per ton provides positive answers. The possible rail transport option provides worse results than the road option, because of the additional capital spending and would only be an option for coal prices above R390 per ton. Therefore, from an economic perspective, road transport would be the preferred option.

From a social perspective, TA2 (rail transport) would be the preferred alternative as impacts associated with road transport (i.e. dust) will be eliminated as well as public health concerns (refer to Annexure H14 of the EIAR / EMPr for a copy of the Socio-economic Impact Assessment (SIA) report)

The Traffic Impact Assessment (TIA) conducted by WSP (refer to Annexure H10 of the EIAR / EMPr) provided the following results in terms of the transport options investigated:

- Scenario 1 (TA1) - Road Hauling Only: this is considered to have the worst impact but the performance of the intersection is still acceptable in the peak hours at Level of Service (LOS) C, which represents low congestion levels.
- Scenario 2 (TA3) - Combination of Road and Rail: the traffic impact is less due to there being less trucks on the road – performance improves slightly and remains at LOS C.
- Scenario 3 (TA2) - Rail hauling only: the traffic impact for this scenario is expected to be the least with LOS A performance (free flowing) in the AM peal and LOS B performance in the PM peak.

From a traffic perspective TA2 (rail transport) is thus the preferred option.

From an air quality perspective, the following alternative assessment results have been provided in the Air Quality Impact Assessment Report, compiled by Shangoni Management Services (refer to Annexure H6 of the EIAR / EMPr):

- When compared to the other transport alternatives, TA1 (road transport) is expected to generate the most particulate emissions. TA2 (rail transport) is expected to generate the least amount of particulate emissions, and transport alternative TA3 (combination of TA1 and TA2) is expected to generate less particulate emissions than TA1.

Rail transport is thus the preferred option from an air quality perspective.

The Environmental Noise Assessment Report Services (refer to Annexure H7 of the EIAR / EMPr), indicated that the road transport option is preferred above the rail option.

The Visual Impact Assessment (VIA) Report indicated that there is no specific preferred transport alternative, as all three scenarios will result in an increased visual impact (refer to Annexure H9 of the EIAR / EMPr).

From a technical (practicality) point of view, the road transport option (TA1) is favourable as opposed to TA2 and TA3.

Taking all the environmental, social, economic and technical aspects into account, TA1 (road transport) is the preferred alternative.

Refer to Table 73 below for the advantages and disadvantages of the above-mentioned alternatives.

Table 19: Comparative review – Transport alternatives

	TA1: Road transport	TA2: Rail transport	TA3: Combination of road and rail
Environmental	69.44%	79.17%	59.03%
Social	33.33%	83.33%	58.33%
Technical	85.19%	40.74%	59.26%
Economic	86.67%	56.67%	33.33%
FINAL SCORE	**68.66%**	**64.98%**	**52.49%**

7.1.4 Design alternatives

7.1.4.1 Buildings and associated facilities

In terms of the construction and / or placement of the mine offices, workshops and change houses on-site, the following alternatives have been identified:

- BA1: Construction of permanent buildings; and
- BA2: Placement of pre-fabricated raised structures.

In order to reduce the environmental impact on the area, it is recommended that all structures on the site be of a less-permanent nature. The current preferred alternative is thus for the mine offices, workshops, and change houses to be in the form of pre-fabricated structures. These structures will be raised and will be easily removed at the end of the LOM. Alternative BA2 will result in a smaller construction footprint, as containers are constructed elsewhere, and only require assemblage on-site. Rehabilitation upon mine closure within these areas are likely to be easier and less time consuming, as infrastructure can easily be removed, allowing the visual qualities of the area to be restored sooner and more efficiently.

Table 20: Comparative review – Buildings and associated facilities alternatives

	BA1: Permanent buildings	BA2: Prefabricated raised structures
Environmental	50.00%	66.67%
Social	58.33%	66.67%
Technical	59.26%	66.67%
Economic	33.33%	67.67%
FINAL SCORE	**50.23%**	**66.67%**

7.1.4.2 Conveyor from screening and crushing plant to railway line on the southern side of the R29

Should transport alternative (TA2) (rail transport) and TA3 (combination of road and rail) be implemented (note – not indicated to be the preferred alternatives), then the proposed conveyor system is to cross the R29 Provincial Road (from north to south) in order for the product to be loaded onto railway wagons and transported via rail. Two alternatives have been considered for the conveyor crossing the R29. These are:

- CA1: Over the R29; and
- CA2: Under the R29.

The following has been taken into consideration with regards to the conveyor crossing over or under the R29:

- From a visual perspective (indirectly also influencing the social aspects), the proposed conveyor where it crosses under the R29 (CA2) will not be visible when driving on the R29, as opposed to the conveyor crossing over the R29 (CA1). Earthworks associated with the excavation works, may however (for CA2) temporarily have a visual impact on road users, which is the case for CA1 as well.
- From a traffic and community safety point of view a conveyor crossing under the R29 would be favourable, as there would less distractions to road users with a conveyor crossing under the R29 than over the R29.
- For aspects such as soil and surface (storm) water, a conveyor crossing over the R29 would be favourable, since the construction of culverts or storm water management measures and excavation works will have a higher impact than the construction of a bridge for the conveyor running over the R29.
- It is anticipated that aspects such as constraints to the layout, construction duration and site rehabilitation will result in CA1 (conveyor crossing over the R29) would be more favourable (from a technical perspective).

Taking all aspects into account, CA1 (conveyor crossing over the R29) is the preferred alternative. Note that this is only relevant if the rail transport option (TA2) or combination of rail and road option (TA3) is implemented (not the overall preferred transport alternatives).

Table 21: Comparative review – Conveyor alternatives

	CA1: Conveyor over the R29	CA2: Conveyor under the R29
Environmental	61.11%	61.11%
Social	41.67%	58.33%
Technical	55.56%	46.30%
Economic	56.67%	43.33%
FINAL SCORE	**53.75%**	**52.27%**

7.1.5 Location alternatives

7.1.5.1 Plant location alternatives

The following two plant locations have been identified and assessed during the process:

- PL01: Plant location alternative 1 – Where the proposed plant complex is located to the north of the R29 (east of the existing access road to the Winterhoek farms) (refer to Figure 17); and
- PL02: Plant location alternative 2 – Where the proposed plant complex is located to the south of the R29 (refer to Figure 18).

Figures 19 and 20 below show the sensitivities on-site in relation to both location alternatives.

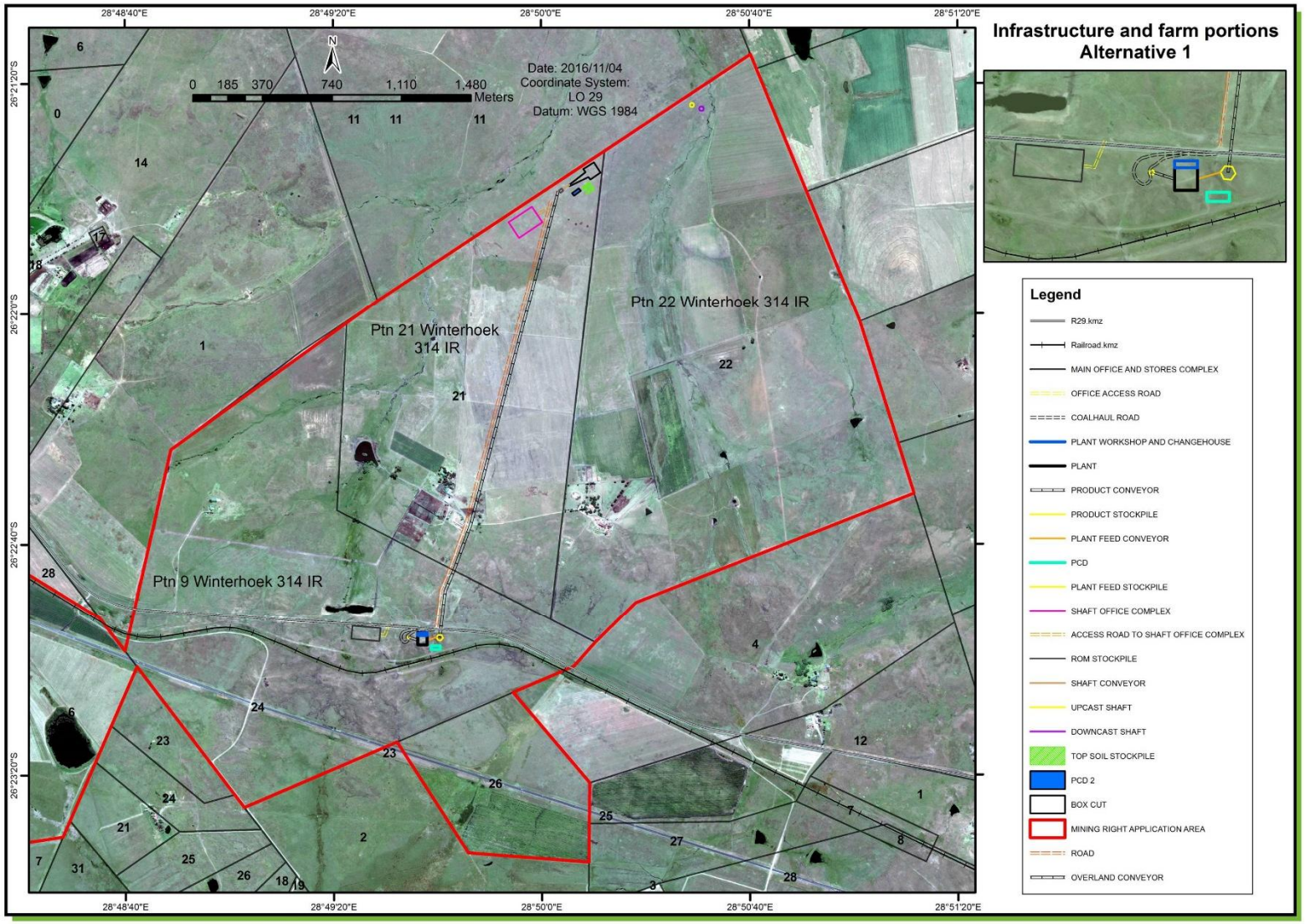

Figure 17: Plant Location Alternative 1 (PL01)

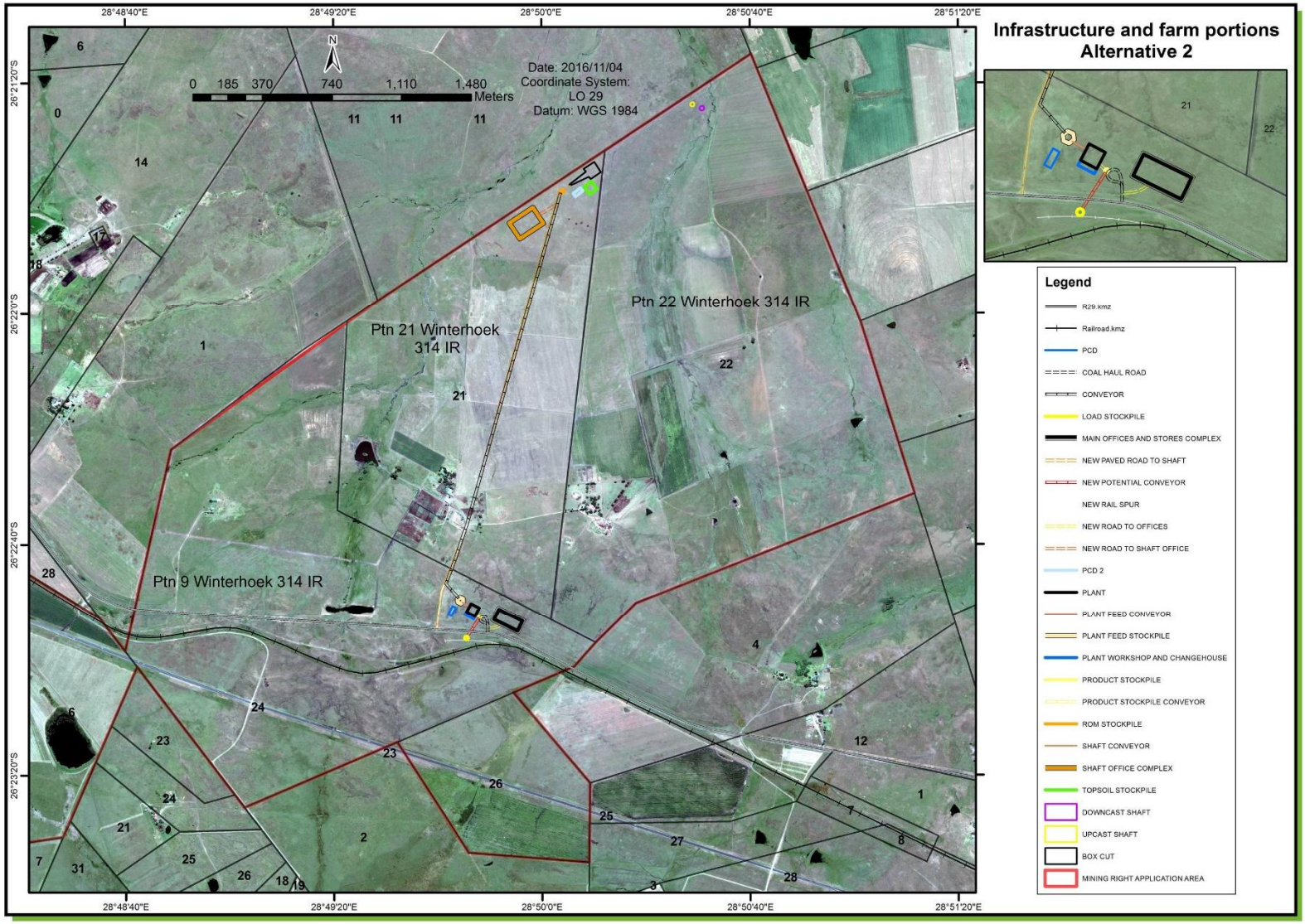

Figure 18: Plant Location Alternative 2 (PL02)

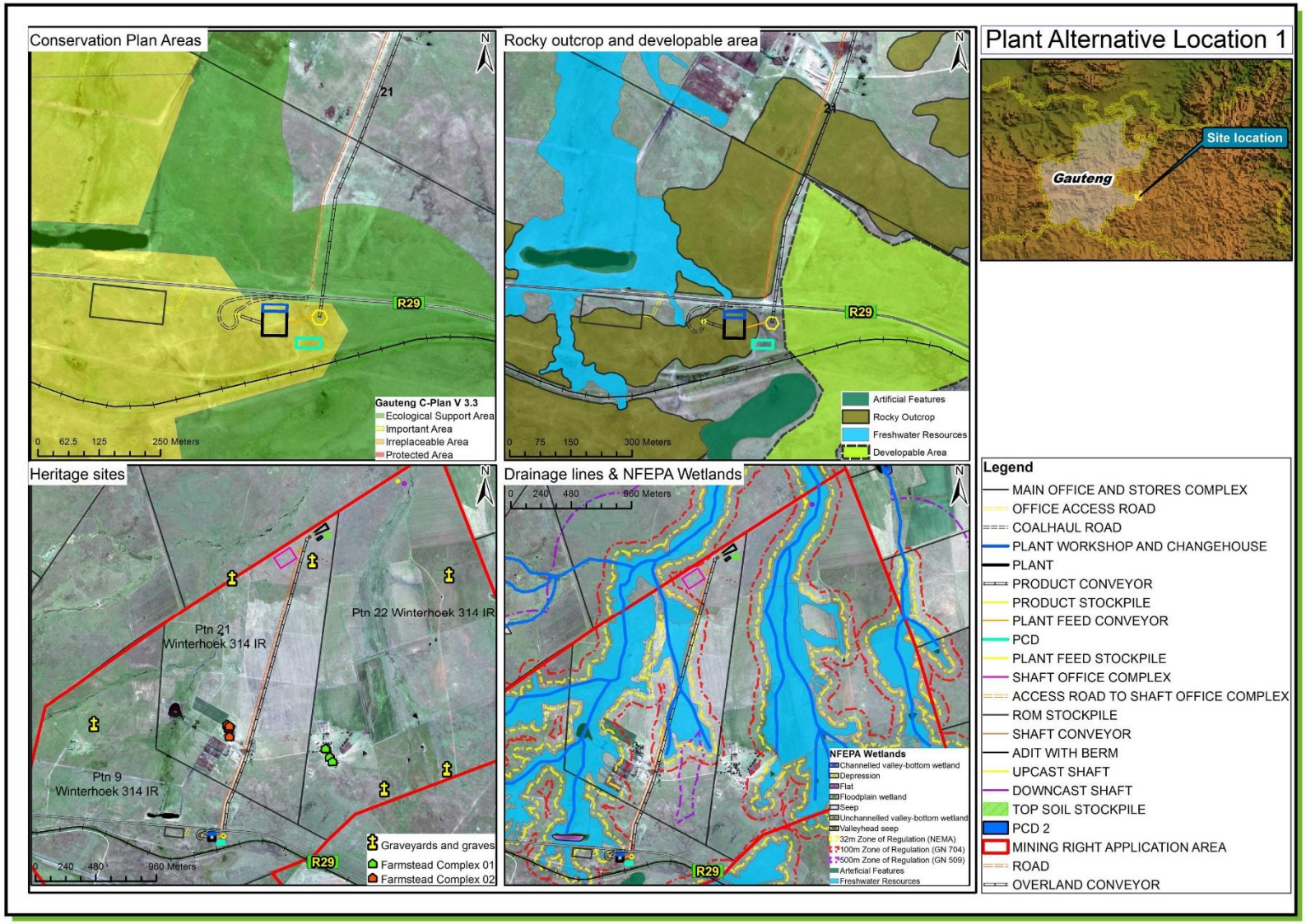

Figure 19: Sensitivity map for Plant Location Alternative 1 (PL01)

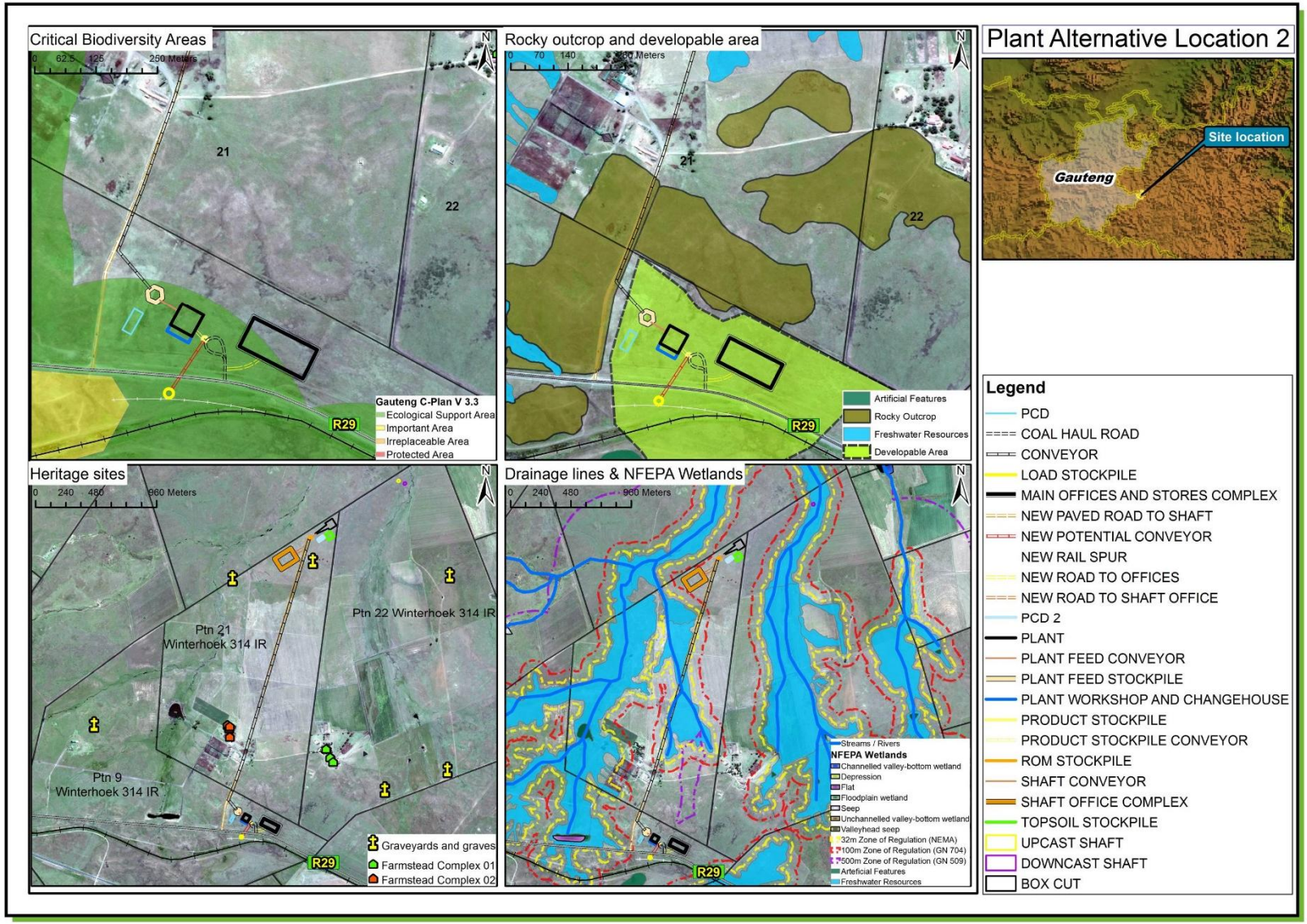

Figure 20: Sensitivity map for Plant Location Alternative 2 (PL02)

The following has been taken into consideration with regards to the location of the proposed crushing and screening plant and associated infrastructure:

- The proposed plant and main offices stores infrastructure will be highly visible from both the R29 and the N17 roadways with both alternatives (PL01 and PL02).
- With PL01, the plant and office complex infrastructure is located within the sensitive rocky outcrop habitat unit and within the 32m (NEMA) and 100m (GN 704) zones of regulation of the wetland habitat unit. For PL02, the plant and office complex is located outside of the sensitive rocky outcrop habitat unit and within the modified habitat unit considered to be of a low ecological sensitivity. As a result, the impact on the floral ecology within the plant and office complex infrastructure footprint areas is considered to be low, as this habitat does not provide suitable habitat for floral SCC, nor is the habitat integrity considered to be significant.
- From a wetland / freshwater perspective, the office and plant complex-infrastructure footprint (for PL01) is in relative close proximity a freshwater resource (albeit separated by a road). Leakages and runoff from the operational plant could negatively impact on this freshwater resource, especially on its surface and groundwater. With the implementation of PL02, the plant and office complex is located outside of any freshwater resources, and not in close proximity to any freshwater resources, thus no impacts regarding the placement of these infrastructures is expected on the freshwater ecology of the area.
- From an air quality perspective, and taking the location of sensitive receptors into account, plant location alternative PL01, combined with transport alternative TA2, is expected to result in the lowest dustfall rates and particulate ground level concentrations. However, as per Section 3.2.4 above, TA2 (rail transport) is not the overall preferred alternative. Plant location alternative PL02, combined with transport alternative TA2, is expected to still result in low dustfall rates and particulate ground level concentrations. Plant location alternative PL02, combined with transport alternative TA1, is expected to result in the highest dustfall rates and particulate ground level concentrations of all alternatives.
- With PL02, the majority of the proposed infrastructure will be located on the identified Arcadia soil form, with limited disturbance of the sensitive rocky outcrop areas. This will have a medium-low impact on the land capability for the Arcadia soil forms, and low impact on the Mispah/Glenrosa soil form. However, the susceptibility of the vertic Arcadia soils to shrink under dry conditions and swell under moist conditions may cause undesired damage on the structural integrity of the surface infrastructure; and the structural integrity of these soils is anticipated to deteriorate during stockpiling while awaiting rehabilitation. With PL01 the infrastructure would be located on the identified Mispah/Glenrosa soil forms, and is considered to have the least land capability impacts due to the inherently poor land capability of these soils attributed to their shallow nature. Minimal mitigation would be required for these soils as they are presumably resistant to compaction due to shallow underlying hard rock.

- Alternative 2 (PL02) consists of a larger footprint area in terms of the proposed infrastructure layout with a larger area for the generation of affected surface water runoff to be contained, as opposed to Alternative 1 (PL01).
- There is a larger clean water catchment area located on the north-eastern side of the proposed infrastructure if located as per PL02. Runoff from the catchment will have to be diverted away towards the proposed shaft access road. Investigations should be conducted to determine the need to construct a storm water culvert underneath the shaft access road to prevent scouring and erosion as a result of storm water runoff diverted from the proposed berm. Although the expected runoff volumes are more than the expected volumes calculated for alternative PL01, there are no additional storm water management implications for alternative PL02. The larger storm water volumes would also be manageable as per the case for PL01.
- Alternative PL02 will be located at a further distance from drainage lines.
- From a heritage perspective, no preferred alternative is applicable, as with both alternatives, the screening and crushing Plant directly north or south of R29 would be located within an area where no heritage resources were observed. Further, with both options, the proposed road located 180m to the east of heritage site FC02 and 85m to the west of heritage site GY03.
- The TIA states that if the scenario is implemented where access is taken off the southern side of the R29 (PL01), then the access, if located on the bend of the R29, would be dangerous in that the access would be inside the curve and would limit the sight distance of approaching vehicles along the R29.

From an environmental perspective PL02 is the preferred alternative.

Table 22: Comparative review – Plant location alternatives

	PL01: Plant location alternative 1: Plant to the south of R29 (refer Figure 2)	**PL02: Plant location alternative 2: Plant to the north of R29 (refer Figure 3)**
Environmental	47.92%	53.47%
Social	50.00%	58.33%
Technical	53.70%	66.67%
Economic	53.33%	66.67%
FINAL SCORE	**51.24%**	**61.28%**

7.1.5.2 Ventilation Shaft location alternatives

Initially, the ventilation shaft (up-cast and downcast shaft) would have been located within the later identified valley bottom wetland as well as within the 1:100 flood line (refer to Figure 18). However, as an alternative, the location of the ventilations shaft was moved to fall outside the wetland and its buffer

zones, as well as the 1:100 floodline. Refer to Figure 20. The following two alternatives were thus considered, with VL02 being the preferred alternative.

- VL01: Ventilation shaft location alternative 1 – Within the valley bottom wetland (and buffer zones) and 1:100 year flood line; and
- VL02: Ventilation shaft location alternative 2 – Outside the valley bottom wetland (and buffer zones) and 1:100 year floodline.

Table 23: Comparative review – Ventilation shaft location alternatives

	VL01: Within wetland (and buffers) and 1:100 flood line	VL02: Outside wetland (and buffers) and 1:100 flood line
Environmental	53.47%	64.58%
Social	50.00%	66.67%
Technical	42.59%	66.67%
Economic	53.33%	66.67%
FINAL SCORE	**49.85%**	**66.15%**

7.1.6 Water supply alternatives

The following two alternatives have been considered in terms of water supply.

- WS1: Rand water supply; and
- WS2: Borehole supply

The potable water requirements for the mine for use by employees is approximately 40 Kl/d (~0.55 l/s). The Leslie 2 geohydrological study and various others conducted within the area indicate that the Vryheid Formation sandstones/shales are generally not good yielding aquifers and that exploitable quantities are generally only held in fractures. Although the matrix may store significant quantities of water, it can only be tapped if fractures are intersected during drilling. These fractures are generally encountered between 15 and 60 mbs. At depths greater than 60 m the presence of fractures generally decrease with meaningful groundwater yields being extremely rare.

Therefore, if geophysical methods are used to target these fractures the potable requirement of 40 Kl/d could be obtained from water supply boreholes.

The risk related to the use of groundwater for potable supply from boreholes include:

- Loss of resource.
  - Boreholes must be pump tested to determine aquifer properties and sustainable yields. This must be determined by a professional geohydrologist and must not be exceeded.

- Aquifer depletion and risk of lowering groundwater levels on neighbouring properties through the development of a cone of depression.
  - Geophysical methods must be used to site boreholes which should be pump tested to determine hydraulic properties and depression cones.
  - Boreholes must be sited and drilled so as not to impact on privately owned boreholes.

An alternative strategy for potable water requirements on the mine would be to tap into the existing Rand Water pipeline. This would reduce the impact on the groundwater regime to negligible.

However, tapping into the existing rand water pipelines will require additional pipelines to be established to the project site, and may result in impacts on, amongst other: fauna, flora, soil and land capability, and visual impacts. From a technical / practicality and economic perspective, obtaining servitudes for the pipeline could be expensive and time consuming. Obtaining water from Rand Water will add more to the establishment capital costs and working cost. Borehole water may be obtainable fairly close by (dependant on pump tests) and will require less capital and will be produced at lower operating cost than Rand Water.

Taking the environmental, technical and practicality, economical and social aspects into account, the assessment of the two alternatives delivered a close comparison in the results. Refer to Table 24 below.

Table 24: Comparative review – Water supply alternatives

	WS1: Rand water supply	WS2: Borehole water supply
Environmental	61.11%	61.11%
Social	66.67%	41.67%
Technical	38.89%	42.59%
Economic	46.67%	66.67%
FINAL SCORE	**53.33%**	**53.01%**

7.1.7 No-go option

If the Leslie 2 project area reserves are not mined, the *status quo* environmental conditions within the prospecting right area will continue.

Physical and biophysical environment – The proposed project is expected to create a number of environmental impacts, in varying degrees. This includes potential impacts on surface water, wetlands, soil, land use and land capability, fauna and flora, visual aspects, traffic, geohydrology, environmental noise, air quality, heritage resources, and paleontology. Refer to the risk assessment report in

Annexure J for a detailed assessment of the proposed project on the various environmental components.

Socio-economic – As per the Socio-economic Impact Assessment, conducted by Nemai Consulting, stakeholders in the area have conflicting perceptions of the proposed project. Low income groups are interested in the economic opportunities that will arise: local employment, community development programs and skills upliftment. Idleness as a result of limited economic activity in the area has led to substance abuse and social distress. Low income groups perceive the mine as opportunity to combat social ills whilst ensuring the negative impacts such as pollution, dust and other impacts are mitigated effectively to prevent a new set of impacts on the community. The proposed mine will generate local employment opportunities and skills development opportunities. Employment will contribute to household wealth. Households will spend more money which will stimulate the local economy. This stimulus will generate more wealth and opportunity for the local community during the construction phase.

For the middle to high income groups, which are largely the farming community surrounding the town of Devon and Leandra, the implications of the mine are more commercial in nature. The proposed project has created uncertainty about the future viability of farming which has created anxiety amongst farmers. Whilst the mining infrastructure is small, the implications of mining activity as raised by farmers are numerous and include the impact of dust on crop yield, noise, traffic, pollution of underground water and implications for livestock. Social concerns relate to the change in sense of place, the change to social relations as a result of migration towards the area and the burden on infrastructure. Ultimately, both groups, whilst their focus varies, raise important socio-economic impacts that with effective mitigation, can be somewhat controlled.

The Land Trade-off Study and Macro Economic Assessment, conducted by Mosaka Economic Consultants (Annexure H14), states that the local agricultural activities will be impacted on if the mine is constructed and operated; however, the Mpumalanga and Gauteng Provinces will benefit considerably when the mine is operational. The following is noteworthy:

- Poverty alleviation will be supported with 396 net additional direct jobs plus low-income households' receiving an additional R82.87 million annually.
- The total employment created in the two provinces is estimated to be around 958 and additional Gross Domestic Product (GDP) of R433.50 million.

Should the mining right and environmental authorisation / waste management licence for the project not be granted, the socio-economic opportunities mentioned above may not realise. It is also however important to note that should the applicant not proceed with the proposed project, the mining of the coal reserves may not necessarily be avoided as another application can be made by another company unless the Department of Mineral Resources (DMR) sterilises the reserves.

7.1.8 Land use alternatives

The approach of the Land trade-off study and macro-economic assessment (Annexure H14) was to utilise the collected site specific data to determine the comparative feasibility of the project and also the possible impact on local activities. A micro and macro-economic study is aimed at determining the economic and socio-economic indicators to assist in identifying the best alternative land use option in a resource economic re-evaluation.

The basic function of the mentioned specialist study is to determine whether the Leslie 2 Project will enhance net societal welfare as it is using a non-renewable resource to stimulate economic growth. At a broad level, investigating impacts on overall welfare requires considering the efficiency, equity and sustainability of the project. Keeping these principles in mind, the core concept applied by the economist when considering trade-offs is “opportunity cost” - the net benefit that would have been yielded by the next best alternative (for example, if farming is the next best alternative for a piece of land, then the foregone benefit associated with it will be the opportunity cost of any other land use). It is vital information when decision makers are to understand the trade-offs involved in projects. A key part of considering opportunity costs is commonly to highlight the impacts of doing nothing i.e. the “no-go alternative” or also referred to as the “economic baseline” or also the “zero line”. The economic baseline is then established and is used to evaluate possible positive or negative impacts by the proposed mine on the current activities. It must be emphasized that in effect the economic baseline includes macro – and socio-economic, social and environmental issues.

The project area consists of close to 54% allocated to cultivation and crop production (maize, soya- and dry beans, hay and potatoes) and 46% to grazing. The land use was estimated to consist of 43% maize, 6.5% soya and dry beans and 4.5% eragrostis hay.

The economic activities taking place in the specific area was identified and quantified applying accepted methodologies and then converted to economic and socio-economic parameters. The current estimated land use scenario as used in the model in terms of estimated hectares was determined.

After analysing available collected data, extensive use was made of detailed maps and Google Earth, the following summarises the dominant land uses for the inner and outer study areas as applied in the analysis.

Table 25 : Land use in the Inner and outer project area

Land use	Inner Area Hectares	Outer Area Hectares
Maize / Babala production	1 911	11 603
Soya and dry bean production	251	1 791
Eragrostis Hay	201	1 214
Potatoes	0	262
Beef production	2 665	11 530
Total	**5 028**	**26 400**

A standard economic analysis, which consists of a local, provincial and national macro-economic impact analysis and economic cost benefit analysis, was done. The macro-economic impact of the project on the local area, the Mpumalanga and Gauteng Provinces as well as the national economy was determined.

Various stakeholders have raised concerns regarding the sustainability of project development *versus* agricultural and other development. It is therefore required that the long-term sustainable impact be measured in terms of two alternative land use options:

- The Leslie 2 Project is not developed – the "no-go" option. Therefore, current activities continue over the next 50 years without optimisation or expansion.
- The project is developed, the life of the project for a number of years, closure of the mine and land rehabilitated with land which cannot necessarily be utilised at the same level for agricultural purposes. The pre-, during and post-mining impact on the economy *versus* the other alternatives.

The impact on the economy, before, during and after the mine's establishment, is calculated *versus* the non-mining alternative. Focus is primarily on the properties directly affected, but also to a lesser degree on neighbouring properties, due to possible negative environmental impacts, such as air and ground water pollution, noise and visual impacts. The impact of the project on the agricultural sector was calculated to determine whether it may decrease agricultural production.

The analysis of the estimated impact was done in two areas that may be impacted upon by the mining activities, namely:

- The Inner area which is the land within a 4 km radius of the proposed Leslie 2 development and includes the so-called "Mining Right Area and Infrastructure Footprint". Primary data collection was undertaken in the inner area.
- The outer area which includes the land within a 10 km radius (less the 4 km area land) of the proposed development that may be impacted upon to a lesser extent than the 4 km area, surrounding the so-called "Resource Area and Infrastructure Footprint", where use was made of secondary data collection in order to calculate the economic impact of the proposed project.

Table 26 : Comparison – current economic activities versus mining operational phase (2015 prices)

Macro-Economic Parameter	Created and supported by the Mining Activity	Created and supported by the Current Activities	Estimated losses due to Mining Activities	Net Additional Benefit
Total GDP (Rand million)	R455	R1 168.86	R-21.50	R433.50
Direct Employment	415	879	-19	396
Total Employment	1 008	3 309	-50	958
Payments to Low-income HH (R Mil.)	R85.0	R137.73	R-2.13	R82.87
Total Payments to HH (R Mil.)	R502	R429.87	R-8.31	R493.69

A qualitative comparison of the current land use activities (forming part of the “No-go” option) and the proposed mining activity is provided in Table 27 below.

Major potential impacts associated with each land use alternative have been summarised for comparative purposes. Each land use alternative may impact or may have already posed an impact on the natural environment at the proposed site.

Table 27: Land use alternative assessment

Environmental component	Mining and related activities (LU1)	'No go' option[54]			
		Beef production (LU2)	Crop production (LU3)	Poultry production (LU4)	Buffalo and game rearing (LU5)
Geology	Blasting and mining of the coal seams will permanently destroy or disrupt the geological sequence.	No impact.	No impact.	No impact.	No impact.
Topography	Topography may be altered by the mining and related activities.	Overgrazing may result in soil erosion which in turn may alter the topography.	Topography has already been altered to some extent by agricultural activities.	Potential small topography changes due to construction of infrastructure for poultry production.	Overgrazing may result in soil erosion which in turn may alter the topography.
Soil	Soil structure and functioning may be altered.	Overgrazing may result in the exposure of bare soils to the elements, which may lead to erosion.	Soils will be chemically and physically modified.	Soil may have already been chemically and physically modified in some areas as a result of agricultural activities.	Overgrazing may result in the exposure of bare soils to the elements, which may lead to erosion.
Land use	Land use will be characterised as mining and related activities in some areas.	Land use will be characterised as agriculture.	Land use will be characterised as agriculture.	Land use will be characterised as agriculture.	Land use will be characterised as agriculture.

[54] The "No-go" option includes beef production, crop production, poultry production or buffalo and game rearing (current activities undertaken in the area), or a combination thereof.

Environmental component	Mining and related activities (LU1)	'No go' option[54]			
		Beef production (LU2)	Crop production (LU3)	Poultry production (LU4)	Buffalo and game rearing (LU5)
Land capability	Long-term withdraw of land from agricultural production and other land uses, particularly where the surface infrastructure will be placed and the surrounding vicinity.	Land capability may be lowered if overgrazing occurs.	Land capability may be impacted on if poor farming techniques are employed.	Land capability may be impacted on should soil erosion, soil compaction or soil contamination take place as a result of poultry production related activities.	Land capability may be lowered if overgrazing occurs.
Flora	As the activity includes the clearance of vegetation, flora associated with the location of infrastructure may be impacted on.	Natural vegetation may be impacted on if overgrazing occurs.	Natural vegetation will be removed in all crop areas.	Natural vegetation will be removed in area associated with poultry-related infrastructure.	Natural vegetation may be impacted on if overgrazing occurs.
Fauna	Fauna will be impacted on as habitats within the areas where infrastructure will be located may be removed or disturbed.	Natural vegetation may be impacted on should overgrazing occur. This in turn may lead to the destruction of habitats.	Fauna will be impacted on as habitats are destroyed.	Fauna may be impacted on due to the introduction or existence of poultry industry infrastructure.	Natural vegetation may be impacted on should overgrazing occur. This in turn may lead to the destruction of habitats
Surface water	Surface water quantity and quality impacts may be associated with the mining and related activities.	Surface and / or groundwater may be used for cattle.	Surface and / or groundwater may be used for irrigation.	Surface and / or groundwater may be used for poultry production. Surface and / or groundwater contamination may occur, if activities are not managed appropriately.	Surface and / or groundwater may be used buffalo and game.
Groundwater	Groundwater quantity and quality may be compromised.				

Environmental component	Mining and related activities (LU1)	'No go' option[54]			
		Beef production (LU2)	Crop production (LU3)	Poultry production (LU4)	Buffalo and game rearing (LU5)
Air quality	Dust will be generated as a result of the proposed mining and related activities.	Dust may be generated if overgrazing occurs and bare soil is exposed to the elements. The use of roads also generates dust.	Dust may be generated if bare soil is exposed to the elements. The use of roads also generates dust.	Dust may be generated if bare soil is exposed to the elements. The use of roads also generates dust.	Dust may be generated if overgrazing occurs and bare soil is exposed to the elements. The use of roads also generates dust.
Noise	Noise levels will increase as a result of the proposed mining and related activities.	No impact.	Noise may be generated during planting and harvesting seasons.	Noise may be generated by the poultry related machinery and activities.	No impact.
Visual	The visual environment will be altered by changes in topography as a result of mining and related activities.	No impact.	The planting of crops will alter the visual environment.	The establishment or existence of poultry production related infrastructure will change the visual environment.	The buffalo camp may have changed the visual character of the area. However, the mentioned camp is located a distance from the R29.
Sensitive landscapes	Sensitive landscapes may be impacted on by mining and related activities.	Sensitive landscapes may be altered or destroyed by cattle or if overgrazing occurs.	Sensitive landscapes may be altered or destroyed.	Sensitive landscapes may have already been altered due to current poultry production activities within the area.	Sensitive landscapes may be altered or destroyed by game / buffalo, or if overgrazing occurs.
Sites of archaeological	Heritage resources or artefacts (if any) may be impacted on by the mining	Heritage resources or artefacts (if any) may be impacted on by cattle.	Heritage resources or artefacts (if any) may be	Heritage resources or artefacts (if any) may be impacted on as a result of	Heritage resources or artefacts (if any) may be

Environmental component	Mining and related activities (LU1)	'No go' option[54]			
		Beef production (LU2)	Crop production (LU3)	Poultry production (LU4)	Buffalo and game rearing (LU5)
and cultural interest	and related activities. No significant impacts on heritage resources were however identified.		impacted on by crop production.	poultry production activities in the area.	impacted on by game / buffalo.
Socio-economic	Poverty alleviation will be supported with 396 net additional direct jobs plus low-income households' receiving an additional R82.87 million annually expressed in 2016 prices. The total employment created in the two provinces is estimated to be around 958 and additional GDP R433.50 million.	Some additional jobs may be created. Estimated current agricultural value (2015 prices) • Weaner production = R17.02 Million • Beef feedlot = R765.59 Million.	Some additional jobs may be created. Estimated current agricultural value (2015 prices) • Maize = R243.26 Million • Soya and dry beans = R28.09 Million • Hay = R15.94 Million • Potatoes = R32.11 Million	Some additional jobs may be created. Estimated current agricultural value (2015 prices) • Poultry Eggs = R178.94 Million. • Poultry Broilers = R5.29 Million.	Some additional jobs may be created. Financial gain would only be realised in the next 2 to 4 year period. The future amount for 2020, is projected at R2.196 million per annum.
Interested and affected parties	Surrounding landowners may be further impacted upon as a result of impacts listed above.				

Environmental component	Mining and related activities (LU1)	'No go' option[54]			
		Beef production (LU2)	Crop production (LU3)	Poultry production (LU4)	Buffalo and game rearing (LU5)
Cumulative impacts	Various cumulative impacts in terms of the above-listed environmental aspects may occur within the area as a result of mining and related activities. This may include impacts on: • Groundwater; • Surface water; • Sensitive landscapes; • Air quality; • Fauna and Flora; and • Traffic.	A combination of different agricultural activities may result in a number of cumulative impacts on the environment, such as: • Overgrazing; • Spread of alien vegetation; • Erosion; • Dust generation; • Surface water contamination; • Soil compaction; • Soil contamination; • Visual aspects; • Heritage resources; and • Impacts on wetlands and sensitive landscapes, etc.			