7.2 Details of the Public Participation Process Followed

A detailed public participation process was undertaken as part of the Scoping and EIA processes. As required by the NEMA (1998), EIA Regulations, dated December 2014, the following has been conducted as part of the Environmental Authorisation application (proof thereof is included in the Public Participation Report attached as Annexure G to this report):

- Advertisements.
  - Newspaper advertisements were placed in local newspapers.
- Site notices.
  - Site notices were placed around, in close vicinity to the site within the surrounding towns.
- Written notices.
  - Written notices (including BIDs) were distributed to I&APs and Stakeholders.
- Availability of Scoping Report for public review
  - The Scoping Report was made available for public and stakeholder review for a period of 30 days from 21 June 2016 to 21 July 2016.
- Focus Group Meetings and One-on-One Sessions
  - Focus Group Meetings and One-on-One Sessions were held with the landowners within the Mining Rights Application area, Ward Councillor as well as the Impumelelo Unemployment Youth Forum. Refer to Annexure G.
- Authorities meeting
  - A pre-application meeting was held with the Competent Authority (the DMR). Refer to the minutes of the meeting in Annexure C.
- Availability of EIAR / EMPr for public review
  - This EIAR / EMPr is made available for public and stakeholder review for a period of 30 days from 03 February 2017 to 03 March 2017.
- Public Meeting
  - Two public meetings have been arranged (to be held in Devon and Leandra) on 10 February 2017. The minutes of the meetings, comments and responses thereto will form part of the Final EIAR / EMPr. The Public Participation Report in Annexure G will also be finalised and submitted along with the EIAR / EMPr (subsequent to the public meetings and EIAR / EMPr public review period)

7.3 Summary of issues raised by I&APs

All issues and comments raised by Interested and Affected Parties (I&APs) during the process have been included in Table 28 below. Furthermore, any further comments received from I&APs during the EIAR / EMPr public review period, will also be incorporated into the Public Participation Report and summarised in Table 28 below (subsequent to the EIAR / EMPr public review period having ended on 03 March 2017).

Table 28: Summary of the issues raised by the I&APs

Interested and Affected Parties	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES				
Scoping Phase				
Landowner/s	Mark with an **X** where consulted			
Dr Cornelius Lucas Muller *(Landowner of RE of Portion 6 of Palmietfontein 316 IR and Portion 22 of Winterhoek 314 IR)*	**X**	Discussion on 11 August 2016 at 12:18 as well as registration form and hand-written comments received 15 August 2016	The I&AP indicated that there will be adverse impacts on his farming activities should the proposed mine be operational in the area. He is concerned that the value of his land will decrease as a result of the proposed mining activities taking place on, and close to, his properties (Portion 22 of the farm Winterhoek 314 IR and RE of Portion 6 of the farm Palmietfontein 316 IR) (which is a consolidated farm according to information provided by Dr Muller). He also indicated his concern that the mining activity will negatively impact on his farming business.	Response during Scoping Phase: The following specialist studies (amongst other) form part of the list of studies that will be conducted during the Environmental Impact Assessment (EIA) Phase of the project: • Land Trade-off and Macro Economic Assessment; • Socio-economic Assessment; • Soil, Land use and Land Capability Assessment; and	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexure J. Refer also to Annexures H1, H5, H13 and H14.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			The I&AP enquired as to whether the mine will result in groundwater contamination and indicated that the groundwater on his property is of a very good quality.	• Geohydrological Assessment These studies will identify and assess the potential impacts on the value of the land, the value of the soil and land capability, groundwater conditions, as well as the socio-economic conditions within the area. Impact significance and mitigation measures obtained through specialist studies will be used in the EIA report that the EAP will compile and submit to the Department of Mineral Resources (DMR).	
			The I&AP asked about the Ventilation shafts that will be located on Portion 22 of the farm Winterhoek 314 IR and indicated that it may remove a large section from his good grazing land.	Response during Scoping Phase: As mentioned in response above, a Soil, land use and land capability Assessment will be conducted as part of the EIA process that will determine the baseline conditions of the site as	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR /

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				well as the potential impacts of the activities on the environmental components.	EMPr and Annexure J. Refer also to Annexure H.
			The I&AP indicated that it may be best for the mine to purchase his property	<u>Response from applicant during Scoping Phase</u>: The mineral right holder will enter into a Memorandum of Understanding ("MoU") with the land owner which will stipulate the land acquisition parameters to be considered at a later date as well as manage the engagement process in the interim.	Not applicable to this EIAR / EMPr.
			The I&AP enquired as to how far the Mine complex will be from his farm portion(s).	<u>Response during Scoping Phase</u>: As can be seen in Figure 4, the proposed Shaft complex will be located in the north-eastern corner of Portion 21 of Winterhoek 314 IR (close to the farm portion border from Portion 22 of Winterhoek 314 IR). The	Figure 4 – Site plan

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				Plant- and Office complex will (at this stage) be located on Portion 9 of Winterhoek 314 IR (between the railway road and the R29 road). <u>Update</u>: Due to environmental sensitivities, the Plant location (preferred alternative has moved to the north of the R29).	
			The I&AP expressed his concern again regarding the potential impacts on groundwater (from, for example, seepage from dumps) and indicated that he would need to be compensated, should his water be contaminated by the mining operation. He also indicated that there are a number of boreholes on his farm portion(s) and a fountain and mentioned that tests have been done that indicated good water quality.	<u>Response during Scoping Phase:</u> This concern is noted. Mitigation measures obtained from the geohydrological assessment will be included in the EIAR and EMPr. Also note that the proposed project will not generate waste rock dumps or tailings storage facilities, as the applicant intends on providing a raw (crushed) product to Eskom power stations. Overburden, Run of Mine	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexure J.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				(ROM) and product will however be stockpiled on-site. The impacts relating to these stockpiles have been preliminary identified during the Scoping Phase, and will be assessed in detail during the EIA phase.	
			The I&AP indicated that studies (for another project in the area – Ingwe Coal Corporation) had already been done on his farm portion(s). He indicated that the study results showed that there is a wetland on the site, amongst other. He also enquired as to the cumulative impact along with Ingwe Coal in terms of groundwater, etc.	<u>Response during Scoping Phase:</u> This comment is noted. A wetland delineation and impact assessment will also be done for the proposed Leslie 2 project. Results of this study will be incorporated into the EIAR / EMPr. Specialist studies will also consider other current / proposed activities in the vicinity of the proposed Leslie 2 project.	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H.
			The I&AP indicated that he is concerned about increased crime (safety), noise and dust, and wetlands (catchment area).	<u>Response during Scoping Phase:</u> As part of list of specialist studies identified in the Plan of Study for EIA	Sections 8.5; 8.6.3 and 9.3.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				(Section 9.3), a socio-economic assessment, noise assessment and air quality assessment will be conducted for the proposed project and will be included in the EIAR / EMPr.	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H.
			The I&AP indicated that the applicant does not have water rights in terms of legislative requirements and indicated that water is used for his 365 cattle and 300 sheep as well as for farm workers (domestic purposes). He indicated that he either needs to be compensated should water potentially be contaminated ("*water must be supplied to all reservoirs and the farmhouse at no cost to the owner on a continuous basis, or, if not possible, buy my farm*").	<u>Response during Scoping Phase:</u> The applicant is aware of the legislative requirements in terms of the National Water Act, 1998. Refer to the response from the applicant above regarding A Memorandum of Understanding.	-

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Mr Stefan Kruger (Kruger Boerdery) *(Landowner of Portions 9, 13 and 21 of Winterhoek 314 IR)*	**X**	Letter dated 11 August 2016, received via email on the 11th of August 2016 from Mr Johann Minnaar (Representative of Kruger Boerdery) *Refer also to the letter, attached to the Public Participation Report (Annexure G)*	I act under instructions and a mandate received from Kruger Boerdery (SK Trust), represented by Mr. Stefan Kruger (Snr). Kruger Boerdery is conducting cattle/sheep farming and game farming (breeding of buffalo and game) on the above properties. The properties comprise of the necessary farming infrastructure as part of the farming businesses and enterprises, including residential farmhouse and cattle feeding pens. Vegetation is generally grazing veld with a small portion of arable grazing (lusern).	<u>Response during Scoping Phase:</u> Noted. Refer to the EAP's responses to specific comments below. Mr Johann Minnaar has been added to the I&AP register for the project.	Public Participation Report (Annexure G)

Mr Stefan Kruger (Kruger Boerdery) *(Landowner of Portions 9, 13 and 21 of Winterhoek 314 IR)*	**X**	Letter dated 11 August 2016, received via email on the 11th of August 2016 from Mr Johann Minnaar (Representative of Kruger Boerdery) *Refer also to the letter, attached to the Public Participation Report (Annexure G)*	I refer to the Background Information Document ("BID") attached to your letter dated 11 June 2016 and which came to the knowledge of my client. You are hereby advised that my client as referred to above is an affected and interested party ("AIP"), and you are requested to register my client, and the writer as its authorized representative, on your data base for this project, and advise the writer on all intended documentation, reports and meetings as may be submitted and proposed in future; the contact details as which appear on this letterhead. I have scrutinized and perused the draft Scoping Report and its Annexures as provided to affected and interested parties on your website, and raise the following comments:	<u>Response during Scoping Phase:</u> Noted. Refer to the EAP's responses to specific comments below. Mr Johann Minnaar has been added to the I&AP register for the project.	Public Participation Report (Annexure G)

Mr Stefan Kruger (Kruger Boerdery) *(Landowner of Portions 9, 13 and 21 of Winterhoek 314 IR)*	**X**	Letter dated 11 August 2016, received via email on the 11th of August 2016 from Mr Johann Minnaar (Representative of Kruger Boerdery) *Refer also to the letter, attached to the Public Participation Report (Annexure G)*	1. The sketch plans referred to in the BID and the draft Scoping Report ("SR") and particular the draft Mining Work Programme ("MWP") are of such a small scale that detail concerning the location of the proposed surface infrastructure are difficult to identify. My client will appreciate it if a map on a bigger scale could be made	<u>Response during Scoping Phase:</u> This comment is noted. The maps were made to the particular scale in order for the larger mining area (which covers a large extent), but to also indicate the surface infrastructure (along with the total mining rights boundary area, as well as (where relevant) the environmental components on the site. Furthermore, the site plan was divided into three different site plans in order to be able to show the 'zoomed-in' sections (referred to as "complexes) in Figures 4, 5 and 6. In the left bottom corner of these three site plans, a 'zoomed-out' version of the plan is also shown. Should the I&AP wish, Shangoni can provide him with a map showing the infrastructure on one map. Furthermore, kmz (google) files can be made available to the I&AP. <u>Update</u>: Maps to appropriate scale was later provided to the I&AP. Subsequently, (during the meeting held at Mr Stefan	Figures 4, 5 and 6

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				Kruger's farm), the I&AP also requested that the sizes and extent of infrastructure be indicated on the figures / maps. This was acknowledged. Refer to Figures 5 and 6 of this EIAR / EMPr, which will also be sent to the I&AP and his representative via e-mail.	
			2. It is confusing to note that, according to the sketch plans attached to the BID and the SR, the proposed surface infrastructure are indicated as to be located on portions of my client's properties, whilst the draft MWP on page 37 makes the following statement under paragraph 5.7.1, namely Based on underground mining, the mine infrastructure will be situated in the north"---eastern corner of Portion 22 of the farm Winterhoek 314 IR. The mine infrastructure will consist of the	<u>Response during Scoping Phase:</u> This discrepancy is noted. The specific farm portions on which the infrastructure is proposed to be constructed is indicated in Section 4, below Table 4 as well as in Section 4.2.2 of the Scoping Report. I.e. on Portions 9, 21 and 22 of the farm Winterhoek 314 IR. Refer to Figures 4, 5 and 6 for the site infrastructure layout.	Section 4, below Table 4 and Section 4.2.2 (refer also to footnotes added) of the Scoping Report. Refer to Annexure E of this EIAR / EMPr and Figure 4.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			following…" My client is not the owner of Portion 22.		
Mr Stefan Kruger (Kruger Boerdery) *(Landowner of Portions 9, 13 and 21 of Winterhoek 314 IR)*	**X**	Letter dated 11 August 2016, received via email on the 11th of August 2016 from Mr Johann Minnaar (Representative of Kruger Boerdery) *Refer also to the letter, attached to the Public Participation Report (Annexure G)*	3. My client therefore in the light of the confusion as sketched in paragraph 2 above requires clarification concerning any proposed surface infrastructure that is proposed on his properties as such and detail thereof.		
			4. It is noted in the schedule referred to on page 97 under the heading "Land Purchases/Servitudes" that an amount of R 70 000 p/ha is budgeted for such acquisition of land. Kindly explain how and on what basis such calculation was done. It should be recorded that the proposed purchase price and a proposed servitude on my client's properties are rejected.	<u>Response from applicant during Scoping Phase</u>: The "Land Purchase" consideration has been based on previous purchase considerations for land acquisitions with similar land use Additionally, it should be noted that the mineral right holder will enter into a Memorandum of Understanding ("MoU") with the land owner which will stipulate the land acquisition parameters to be considered at a later	Not applicable to this EIAR / EMPr.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				date as well as manage the engagement process in the interim.	
			5. Section 23(2)(b) of Chapter 5 of the National Environmental Management Act, No. 107 of 1998 ("NEMA") states one of the general objective of integrated environmental management namely, to identify, predict and evaluate the actual and potential impact on the environment, socio---economic conditions…" The SR fails to address the socio---economic conditions of, in particular the AIP, and the socio--- economic impact which the proposed mine will have on its farming business at large, taking into account that the AIP will suffer loss and damage due to grazing loss, and consequently income loss. The Applicant is requested to adhere to the above provisions of NEMA, and to appoint an agricultural	<u>Response during Scoping Phase</u>: As per Appendix 2 of the EIA Regulations GNR 982, dated December 2014, this Scoping Report contains the following: *2(i) A plan of study for undertaking the environmental impact assessment process to be undertaken, including-* *(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;* *(iii) aspects to be assessed by specialists.* The Plan of study includes the following specialist studies to be included during the EIA Phase:	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			economist who will be able to compile an environmental report with regard to the socio---economic impact which the proposed mine will have on the farming business of the AIP	• Socio-economic assessment; and • Land Trade-off and Macro Economic Assessment.	
Mr Stefan Kruger (Kruger Boerdery) *(Landowner of Portions 9, 13 and 21 of Winterhoek 314 IR)*	**X**	Letter dated 11 August 2016, received via email on the 11th of August 2016 from Mr Johann Minnaar (Representative of Kruger Boerdery) *Refer also to the letter, attached to the Public Participation Report (Annexure G)*	My client has also the following preliminary comments and concerns: a) The depleting and contamination of underground water due to underground mining. b) The risk associated with ground subsidence. c) Damage to surface structures.	<u>Response during Scoping Phase</u>: The following specialist studies (amongst other) will be conducted during the EIA Phase: • Socio-economic Assessment; • Land Trade-off and Macro Economic Assessment; • Soil, land use and land capability; • Wetland Assessment; • Fauna and Flora Assessment; and • Blasting and Vibration Assessment.	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
	X	Letter dated 11 August 2016, received via email on the 11th of August 2016 from Mr Johann Minnaar (Representative of Kruger Boerdery) *Refer also to the letter, attached to the Public Participation Report (Annexure G)*	d) The effect of blasting operations on their properties and people residing on their properties; e) Contamination of grazing veld due to coal dust and coal debris. Contaminated grazing has a detrimental effect on life stock, with consequential financial loss	The studies will identify and assess the potential impacts on the groundwater conditions, impacts from blasting activities; surface subsidence, fauna and flora, soil, land use and land capability, and social and economic conditions. Impact significance and mitigation measures obtained through specialist studies will be used in the EIA report that the EAP will compile and submit to the Department of Mineral Resources (DMR).	
			We reserve the right to amplify and to elaborate on the above points of concern, and other issues that may come to the fore once we are in possession of more detail when the environmental studies have been completed and distributed to us as part of the draft EIA/EMP Reports, as referred to in the SR.	Response during Scoping Phase: The I&AP's comment is noted.	Section 9.7.2

Ms. Barbara Lang	**X**	Registration form dated 21 July 2016, received via email on 21 July 2016	Concerns stated in the registration form are the following: • Pollution (air and traffic) • Noise • Water, wetland, water table and pollution • Influx of people = increase in crime • Sink holes = ground sinking • Impact on wildlife • Property value collapsing	Response during Scoping Phase: As mentioned above, the following specialist studies (amongst other) will be conducted during the EIA Phase: • Geohydrological Assessment; • Socio-economic Assessment; • Land Trade-off and Macro Economic Assessment; • Soil, land use and land capability; • Wetland Assessment; • Fauna and Flora Assessment; • Blasting and Vibration Assessment. Furthermore, a visual impact assessment, noise assessment, atmospheric impact assessment and hydrological assessment will also be conducted. These studies will identify and assess the potential impacts on the various environmental, social and economic components within the area. Impact significance and mitigation measures obtained through specialist studies will be used in the EIA report that the EAP will compile and submit to the Department of Mineral Resources (DMR).	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H.

Mr. Stefan Kruger	**X**	Discussions on 13 July 2016 at 10:56; and 28 July 2016	He indicated that he was disappointment in having to receive his Notification letter at the Butchery in Devon. Furthermore, Mr Kruger indicated that he objects to the mine starting operations on his farm. He indicated that he is concerned about the quality of groundwater that will be affected, as well as an increase in crime and the impact the mine will have on his farming business. During additional conversations with the applicant and EAP, Mr Kruger indicated the following: • He owns 7 farms in the area • The main farm, has the most water in the area, and adjacent farm owners pump water from his farm for agricultural purposes • There is a scenic dam on the farm. • There is a buffalo camp on the farm- well managed and planned • Mr Kruger plans on enlarging the buffalo camp to increase the grazing and prevent the buffalo from starving (loss).	<u>Response during Scoping Phase</u> The EAP (Shangoni) apologised for Mr Kruger having received the letter from the Butchery. She explained that SK Trust's' (the I&AP's farming business) details were not updated on the Deed Search website and therefore there was no way for the EAP to get hold of Mr Kruger's details before 12 July 2016 during which a visit to Devon town (and in particular the Butchery) was made by the EAP. The EAP added that indicated that the Mr Kruger's contact details were seen on the farming business' boards located next to the R29, which were also confirmed by the persons working at the Butchery in Devon. The EAP indicated that Mr Kruger's details had been included in the I&AP Register and a notification was sent to him on 13 July 2016. The EAP indicated that she acknowledged Mr Kruger's concerns and explained the EIA process and specialist studies planned for.	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Public Participation Report (Annexure G). Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H. Refer to letter received from Mr Minnaar (above).

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			• The planned conveyor will run across the existing buffalo camp • There are a few protected programmes on the farm (as per the I&APs knowledge) (turtles and owls). His main concern is the crime that will increase as well as labour problems which he may suffer from the mining operation being so close to his farm. Additional concerns were the location of the access routes, the shaft etc.	The EAP then sent Mr Kruger an e-mail (later during the day on 13 July 2016) providing him with the BID and notification, as well as the farm portions map, also asking for confirmation of the farm portions owned by him. The EAP also requested that Mr Kruger should please submit his comments and concerns in writing in order for such concerns and comments to be included in the Scoping Report (Public Participation Report). The EAP contacted Mr Kruger again later the afternoon to confirm his e-mail address and to notify him that she had sent an e-mail to him.	

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Mrs Elize Muller (wife of Dr Cornelius Lucas Muller)	**X**	Discussion on 13 July 2016 at 13:49	The EAP contacted the I&AP in order to confirm the I&AP's contact details and asked which farm portions they are owners of. Mrs Elize Muller indicated that she is not certain but that it is a consolidated farm *(note: Dr Muller later indicated which farm portions are owned by him and confirmed that the portions are consolidated)* The EAP indicated that she will send a BID and notification to Mrs Muller via e-mail and also the farm portions map. She requested that if the I&AP can assist with identifying other land owners and provide contact details, that would be appreciated. Mrs Muller indicated that she will review the documents. No reply from the I&AP has been received by the EAP to date.	Refer to conversation. The EAP sent Mrs Muller an e-mail later during the day on 13 July 2016 providing the mentioned information	Public Participation Report (Annexure G)

Mr Michael Pedro *(Landowner of RE of Portion 3 and Portion 20 of Palmietfontein 316 IR)*	**X**	Discussion on 20 July 2016 at 09:45	Mr Pedro contacted the EAP and asked about the proposed Leslie 2 project. He indicated his concern that the applicant will be mining underneath his properties. He enquired as to why the applicant has not spoken to him and indicated that surely the applicant cannot just start mining. He added that he is concerned about the water, should the mine operate in the area.	<u>Response during Scoping Phase</u> The EAP indicated to Mr Pedro that the applicant has a prospecting right on the relevant properties and that prospecting activities were undertaken a number of years ago. The EAP explained that the Scoping- and EIA processes (as well as the public participation process) to Mr Pedro. The EAP further explained the legislative requirements with regards to a mining right, environmental authorisation and waste management licence. The EAP added that a list of specialist studies will need to be undertaken for the project in order to determine the extent and significance of potential environmental, social and economic impacts. Mr Pedro acknowledged the explanations and discussion and confirmed his contact details.	Public Participation Report (Annexure G) Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				Refer to conversation. Following this conversation EAP sent IAP an sms (again) indicating the availability and details of the Scoping Report and asking for his comments by 12 August 2016. Print screen of sms available	
Lawful occupier/s of the land					
Mr Ian Ras	**X**	Discussion on 13 July 2016 at 14:08	The EAP contacted the I&AP and provided background to the project to him. The I&AP indicated that him and his wife are residents on Portion 11 of Winterhoek 314 IR (a farm portion adjacent to the proposed Leslie mining area) and that the farm is owned by Dr Cornelius Muller. The EAP indicated that she will send him the BID and notification via e-mail and asked if he can assist with identifying other land owners and provide contact details, that would be appreciated. Mr Ras indicated that he will review the documents. No reply from the I&AP has been received by the EAP to date.	Refer to conversation. The EAP sent Mr Ras an e-mail later during the day on 13 July 2016 providing the mentioned information	Public Participation Report (Annexure G)

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Government Authorities and Municipalities					
Mr Anton Maluka (Department of Agriculture, Forestry and Fisheries (DAFF)	**X**	Registration form dated 14 July 2016, received via email on the 14th of July 2016	DAFF's comments are the following: • Agricultural soil potential; and • Declared weeds and invader plants	Response during Scoping Phase: A soil, land use and land capability Assessment, as well as a Fauna and Flora assessment, have been identified during the Scoping process to be undertaken as part of the EIA Phase.	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H.
Mr Caiphus Ncobisizwe Methula (Govan Mbeki Local Municipality)	**X**	Email received on the 14th of July 2016	Caiphus Ncobisizwe Methula stated that he is a resident of Leslie and an employee of Govan Mbeki Municipality. He read about the Leslie 2 mining application on the local newspaper and would therefore like to register as an I&AP	Response during Scoping Phase: Caiphus Ncobisizwe Methula has been registered as an I&AP.	Public Participation Report (Annexure G)
Representative of Department of Agriculture, Forestry and Fisheries (DAFF)	**X**	Discussion on 13 July 2016	A representative of the Department of Agriculture, Forestry and Fisheries (DAFF) phoned Shangoni to find out if the proposed Leslie 2 mining project site was under Gauteng or Mpumalanga. She noticed that it is near the two province' boarders.	Response during Scoping Phase: Shangoni replied that the Leslie 2 Mining project site falls under Gauteng Province and that the application has been submitted to	Figures 1 and 2

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				Gauteng Department of Mineral Resources.	
Landowners or lawful occupiers on adjacent properties					
Mr Johannes Jacobus Louw	**X**	Registration form dated 27 July 2016	The I&AP provided the following concerns: • Groundwater We are cattle farmers and are 100% dependent on groundwater. If you mine it is gone.	<u>Response during Scoping Phase</u>: As mentioned above, the following specialist studies (amongst other) will be conducted during the EIA Phase: • Geohydrological Assessment; • Socio-economic Assessment; • Land Trade-off and Macro Economic Assessment; • Soil, land use and land capability; • Wetland Assessment; • Fauna and Flora Assessment; • Blasting and Vibration Assessment.	Sections 8.5; 8.6.3 and 9.3 of the Scoping Report. Sections 7.5 and 9 (Part A) of this EIAR / EMPr and Annexures J and H.
Mr Johannes Jacobus Louw	**X**	Registration form dated 27 July 2016	• Pollution Devon South is the only area that is not polluted. We have specific plants and birds (wildlife) that you can only get in this area. With your pollution, it is gone. The other pollution is the coal dust. In the end, cattle won't be able to eat the grass anymore.		

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			• Security With influx of labour, theft of cattle and security in general will be a great concern.	Furthermore, a visual impact assessment, noise impact assessment, atmospheric impact assessment, aquatic assessment and hydrological assessments (storm water management, as well as baseline water monitoring) will also be conducted. These studies will identify and assess the potential impacts on the various environmental, social and economic components within the area. Impact significance and mitigation measures obtained through specialist studies will be used in the EIA report that the EAP will compile and submit to the Department of Mineral Resources (DMR).	

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Other interested and affected parties					
Mr Jurg Haywood	**X**	Discussion on 13 July 2016 at 13:46	The EAP asked Mr Haywood (whose detail the EAP received from locals in Devon) for assistance in providing a list of farmers in the area and their contact details, since the EAP was informed by the locals that Mr Haywood is part of the farmers' association of Devon. Mr Haywood replied and said that the EAP should phone him after 15:00 on 14 July 2016.08.12 The EAP phoned Mr Haywood on 14 July 2016. Mr Haywood indicated that he will send the details to the EAP later that night via sms. No information has to date been received by the EAP.	Not applicable. Refer to conversation.	Public Participation Report (Annexure G)

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Environmental Impact Assessment (EIA) Phase					
Landowner/s					
Mr S. Kruger	**X**	18 October 2016 Telephonic discussion		<u>Response from EAP via e-mail:</u> As per your latest telephonic request, please find attached maps made by our GIS specialist, for your perusal. Please let me know if the maps are suitable. I will also be attending the meeting scheduled with Sameera from Nemai Consulting, for tomorrow, and will bring with hard copies of the maps as well.	Refer to Figures 4, 5 and 6
Mr S. Kruger	**X**	19 October 2017 Site Visit held on property 25 October 2017 Site Visit held on property	Two site visits were conducted on Kruger Boerdery with the aim of understanding the impacts on the farm. It was indicated that formal comments will be provided on the EIA Report once it is made available.	Noted	-

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Mr M Pedro	X	18 October 2017 Site Visit held on property 25 October 2017 Site Visit held on property	During the site visit, the following concerns were raised: • Mining will create dust which is exacerbated by constant winds in the area. • This will affect farming and the sense of place. • The farm will be impacted visually • Farmers in the area are completely reliant on boreholes for water. He added that mining will pollute the underground water which will impact on all farming activity and MP expressed concern on the impact on farmers. • MP stated that his property will devalue as a result of the mining activity as no one would want to farm or live in such close proximity to a mining activity. He stated that Anglo Operations should rather purchase the farm	<u>Response provided during site visit</u>: All concerns will be raised in relevant specialist studies that will be conducted. The results of the mentioned study will be made available to I&APs for review, along with the Environmental Impact Assessment (EIA) Report.	Refer to Annexure H for specialist study reports. Refer also to Annexure J for the Risk Assessment Report.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Ms. B Lang	X	19 October 2017 Site Visit held on property	During the site visit, the following concerns were raised: • BL is concerned that the Leslie 2 mine will attract people to the town causing • an influx of people in the area. Devon's infrastructure is already strained and an influx of people will cause traffic problems, create a need for traffic lights and have an impact on the capacity of the sewerage works. • The impact of dust is a major concern to farmers. Dust sitting on crop stunts the development of the plan, affecting yield. BL asked how the dust will impact on yield. • Mining will have an environmental impact. Noise, dust and other impacts will affect fauna in the area which includes, servile, jackals, secretary birds and the African grass owl. • BL stated that the mine will have an overall benefit to the town in terms of employment	<u>Response provided during site visit</u>: All concerns will be raised in relevant specialist studies that will be conducted. The results of the mentioned study will be made available to I&APs for review, along with the Environmental Impact Assessment (EIA) Report.	Refer to Annexure H for specialist study reports. Refer also to Annexure J for the Risk Assessment Report.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			and bettering livelihood. Eskom needs the coal and therefore the need for the mine is understood. However, the impacts on the farm and livelihood are of concern.		
Dr C. Muller	**X**	07 December 2016 Telephonic discussion Site meeting 28 January 2017	• Mining will stop operations on the farm and Anglo should rather purchase the farm as it will be rendered unusable. • The option to transport coal via rail will not be feasible for the farm. • 12 persons are employed on the farm who are already being affected by the project as Mr Muller is currently laying off workers in anticipation of the mine. • The farm currently has 365 cattle and some sheep Dr Muller is the third generation of his family that is living and working on the farm. It is a legacy of his family. He has spent millions on infrastructure, particularly water infrastructure. • Mining activity will have an impact on underground water (as in Mpumalanga and	<u>Telephonic response</u>: Concerns were noted. Anglo to liaise directly with Dr Muller as per request. Anglo Operations scheduled a meeting with Dr Muller for 28 January 2016. The project and process was explained and discussed. <u>Confirmation on points discussed sent by the applicant in an e-mail dated 31 January 2017:</u> Dear Dr Muller Thank you for taking time to meet with Christopher Harding and I on Saturday the 28th of January 2017	Refer to Annexure H for specialist study reports. Refer also to Annexure J for the Risk Assessment Report. Refer to Figures 4, 5 and 6 Refer to Annexure K.

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			North West). The infrastructure on the farm that takes water to each camp will be rendered unusable as his livestock will not be able to drink the polluted water. Anglo will have to buy and deliver clean water to each camp and household on a daily basis. This condition is in a landowner agreement signed by his partner on the farm during the prospecting rights stage. • The EIA is a screen that Anglo is hiding behind to push the mine forward. The EIA is administrative and will not assess anything competently. • Water resources are depleted in the area. The mine will not be able to use the Vaal Dam or pipe to Secunda from water. • Dr Muller said he has received conflicting information regarding the project. • Anglo and the EIA team informed him that high grade coal will be mine. He was subsequently informed by an alternate	As indicated during the discussion, all your concerns raised will be included as part of the Environmental Impact Assessment ("EIA")and associated Environmental Management Plan ("EMP"). We also want to re-confirm the relevance of your participation within the process, so that the project can appropriately mitigate and manage your concerns. (Note that there is information required from you in respect of certain items listed below, marked yellow) Anglo American Coal ("AAC") needs to investigate the historical road created during the coal prospecting phase whereby AAC committed to restore the area to original use. This	

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
			source that the coal is of a low grade. Eskom will not accept a low grade coal and therefore the fact that the	has not taken place and currently the road is being used as a through fair. Dr Muller - please confirm time of occurrence and relevant correspondence with AAC personnel. Dr Muller confirmed his concerns regarding timing of the project, the impact of the mine on surface water, underground water, ground subsidence, access to his farm, contamination and location of the surface infrastructure. Dr Muller wants to understand what rehabilitation activities will be done in respect of the land post mining, as he has a concern regarding surface water contamination and associated effect on surface farming.	

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				What public liability insurance does Anglo have in place and what does it cover. This is especially relevant when considering the option of coal hauling via road going trucks. Should Dr Muller be negatively impacted w.r.t. water, who will provide water? Dr Muller has several points on the farm which will require water. Dr Muller's would be willing to sell his farm to AAC, and therefore suggests AAC investigate an alternative option of placing the required mine infrastructure (Shaft, offices, conveyor, etc.) on Dr Muller's farm in support of potentially acquiring it. Dr Muller has a concern regarding access to the farm, or restriction of	

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				access based on the current mine development plan. There are no cracks visible within the house, will proper monitoring be done in respect of blasting? There is an old family graveyard on the farm, has this been taken into consideration by the project? ➢ Dr Miller please indicate how many graves What is the possibility of registering a servitude in favor of Dr Muller in respect to the road to be used for access to the mine`s infrastructure? What is the detail regarding the ventilation shaft, in terms of on-going	

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				access during the operational phase of the mine? Is it a possibility for Anglo to assist with construction of a dam wall, during the construction phase of the project? ➢ Dr Muller please elaborate on dam wall required Dr Muller indicated that he would not be available to attend the Public Participation meeting on the 10th of February, however, Mr Carstens would attend on his behalf (invite to be sent). *Further discussions will be held subsequent to the above-mentioned e-mail, as well as during the Public meeting. Responses to comments*	

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				and questions will be provided in the final EIAR / EMPr.	
Landowners or lawful occupiers on adjacent properties					
Mrs Jacolien du Plessis daughter of Mr G.J Brits – owner of Portion 11 of Palmietfontein	**X**	29 September 2016 Telephonic discussion with Shangoni Management	Received Scoping Report notification letter regarding the Leslie 2 Project (that was sent via post in August 2016). Requested that we include her as the contact person on the IAP register (on behalf of her father). She also requested more information on the project, as they did not receive the initial notification that included the BID.	<u>Response provided:</u> Nemai Consulting have been by Shangoni Management Services to conduct public participation for the EIA Phase of the project in terms of NEMA. We have been tasked by Wilda Meyer from Shangoni to contact you regarding the above-mentioned project. Herewith the information you have requested 1. Background Information Document (attached to this email); 2. The Adjacent farms map (attached to this email); and 3. The Scoping Report can be accessed on Shangoni's website	Annexure G (Public Participation Report)

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				www.shangoni.co.za under "Public Documents". Should you wish to provide comment or seek additional information regarding the project, please do not hesitate to contact Nemai Consulting.	
Municipalities					
Mr Mashele Lukhele Ward Councillor	**X**	20 September 2016 Telephonic discussion	Request for Scoping Report to be submitted for review. Future documents to be placed for review at the Devon Public Library.	Noted request. A hardcopy of the report was submitted on 03 October 2016.	Annexure G (Public Participation Report)
		16 January 2017 Telephonic discussion	Request that the public meeting is held at the Impumelelo Community Centre.	Noted request and the meeting was moved to the Impumelelo Community Centre	Annexure G (Public Participation Report)
Ms Lindiwe Maria Mbonani Ward Councillor	**X**	20 January 2017 Telephonic discussion	Transport to Impumelelo will a problem for the residents of Ward 1, resulting the community not being well represented at the public meeting. Transport for the Ward Committee members to Devon can be provided.	Noted. It was subsequently agreed that a second meeting for the communities of Leandra will be held on 10 February 2017.	Annexure G (Public Participation Report)

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Tebogo Mutlaneng Assistant Manager: Land Use Management Systems Sedibeng District Municipality	X	Email 28 September 2016	May I kindly request that you send us the full details of this application for mining rights. The application should include all relevant and necessary annexures that would guide our town planning decision processes.	<u>Response provided</u>: We can courier you the report and it's annexures. Can you just kindly send me your physical address for courier purposes. Also, would you prefer a hardcopy or an electronic copy?	Annexure G (Public Participation Report)
			Hardcopy would be most suitable; however, I would really appreciate it if I could have both. Our address is as follows: Sedibeng District Municipality PO Box 471 House and Home Building C/O Voortrekker and Merriman Ave Vereeniging 1930	A hardcopy of the report was submitted on 03 October 2016.	
Department of Land Affairs					
Ms C Benyane, Chief Director Office of Regional Land Claims	X	Letter 17 August 2016	Kindly note that according to out provincial database there are no claims lodged on the property/ies mentioned below:	Noted.	Annexure G (Public Participation Report)

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
Commissioner			➢ Portions 3,4,20,32,40, 41 of Palmietfontien 316 IR Gauteng ➢ Portions 9, 13, 21, 22, 24, 26 of Winterhoed 314 IR Gauteng		
Other Interested and Affected Parties					
Marietjie Eksteen Jacana Environmentals CC	**X**	16 November 2017 Email	Attached please find a self-explanatory notification to the Leandra stakeholders. The download links are still active, so you can download the available reports for the Leandra Project. For any future queries, please contact Lindie Moore from South32. I would also propose that you register her for the Anglo Leslie 2 Project	Response provided: I have asked Sameera Munshi from Nemai Consulting (company facilitating the Leslie 2 Public Participation Process) to send you the registration form. They will also, as per your below request, add Lindie Moore to our I&AP Register. The Leslie 2 Scoping Report has been submitted to the DMR, but is still available on our website (www.shangoni.co.za) (click on Public Documents and Leslie 2 Project).An updated BID (based on infrastructure	Annexure G (Public Participation Report)

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				alternatives and project timeline) will also be sent to registered I&APs in the near future.	
Pieter Nel Transnet	X	18 January 2017 Email	Please provide all info regarding the application. (Plans, letter. Etc)	Response provided: Anglo Operations Limited submitted an application for a mining right (in terms of the MPRDA, 2002), environmental authorisation and waste management licence in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) and the Mineral and Petroleum Resources Development Act (MPRDA), 2002, for the proposed Leslie 2 Underground Mining Operation to be located near Devon in the Gauteng Province. I have attached the Background Information Document which has the details and site plans enclosed. As per the notification you received the Draft	Annexure G (Public Participation Report)
Thabo Andries Mogano	X	25 January 2017 Email	Application for Employment.		

Interested and Affected Parties		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
				Environmental Impact Assessment Report EIAR) and Draft Environmental Management Plan (EMP) will out for review on the 03 February 2017 and can be obtained from the following link http://www.shangoni.co.za/anglo-operations-leslie-2	

7.4 The Environmental attributes associated with the development footprint alternatives. A baseline environment.

7.4.1 Type of environment affected by the proposed activity

A baseline description or "*status quo"* of the present environmental situation is provided in this part of the document. Environmental aspects have been described in the following respective chapters:

- Chapter A: Geology
- Chapter B: Climate
- Chapter C: Topography
- Chapter D: Soil
- Chapter E: Flora
- Chapter F: Fauna
- Chapter G: Surface water
- Chapter H: Aquatic environment
- Chapter I: Wetlands
- Chapter J: Groundwater
- Chapter K: Air Quality
- Chapter L: Noise.
- Chapter M: Blasting and vibration
- Chapter N: Visual
- Chapter O: Traffic
- Chapter P: Protected areas and conservation planning.
- Chapter Q: Sites of archaeological, cultural and palaeontological importance.
- Chapter R: Regional socio-economic structures.

Chapter A: Geology

Information in this section of this report has been obtained from the following documents:

- The report titled: "*Geohydrological EIA in support of a mining right application, environmental authorisation, and waste management licence for the Leslie 2 Project*", dated December 2016 and compiled by Shangoni AquiScience (Annexure H5); and
- Anglo Operations Limited. 2016. Leslie 2 Mining Works Programme.

1 Regional geology

All of the known coal deposits in South Africa are hosted in sedimentary rocks of the Karoo Basin, a large retro-foreland basin which developed on the Kaapvaal Craton and filled between the Late Carboniferous and Middle Jurassic periods.

The Karoo Supergroup is litho-stratigraphically subdivided into the Dwyka-, Ecca-, and Beaufort Groups, succeeded by the Molteno-, Elliot-, and Clarens Formations, and the Drakensburg Formation (S.A.C.S., 1980). The coal ranges in age from Early Permian (Ecca Group) through to Late Triassic (Molteno Formation) and are predominantly bituminous to anthracite in rank. This is a classification in terms of metamorphism under the influence of temperature and pressure.

Based on variations in sedimentation, origin, formation, distribution, and quality of the coal seams, 19 coalfields are defined within the Karoo Basin. These variations are in turn attributed to specific conditions of deposition and the local tectonic history characteristic of each area.

The coal bearing Ecca Group has been divided into three sub-units: the Pietermaritzburg-, Vryheid-, and Volksrust Formations. Within the main Karoo Basin of South Africa, the primary economically important coal seams occur in the Vryheid Formation of the Ecca Group.

The Vryheid Formation rests non-conformably on sedimentary rocks of the Dwyka Group, which are interpreted to be the products of glacial-, fluvio-glacial-, and glacio-lacustrine depositional environments. Documenting and understanding these glacial deposits is important for understanding coal seam thicknesses and qualities, particularly for the 1 Seam and the 2 Seam. The Dwyka Group in the Witbank- and Highveld Coalfield areas is mainly represented by glacially deposited diamictites and varved shales.

2 Highveld coalfield geology

The Leslie 2 project area is situated in the Highveld Coalfield of the Karoo Basin. The Highveld and Witbank coalfields are regarded as one morphological province, because of a marked consistency in the coal succession stratigraphy. The two coalfields are separated from each other by an east to west felsite ridge of Pre-Karoo age. The coal seams occur in the Vryheid Formation of the Ecca Group.

The strata in which the coal seams occur consist predominantly of fine-, medium-, and coarse-grained sandstone with subordinate mudstone, shale, siltstone, and carbonaceous shale.

Seven coal seams, with varying degrees of persistence, occur in the Coalfield. They are numbered from the bottom upward, namely 1 Seam, 2 Seam, 3 Seam, Lower 4 Seam, Upper 4 Seam, 4A Seam, and 5 Seam.

Coal deposition was largely controlled by the glacial Pre-Karoo topography. This undulating floor strongly influenced the sedimentation patterns and extent of the different coal seams. Lower stratigraphic units lie against highs of Dwyka Tillite and Pre-Karoo Bushveld Complex felsites. Thick coal deposits were formed in the deeper parts of the basin, while the coal seams thinned rapidly and petered out against the major palaeohigh areas.

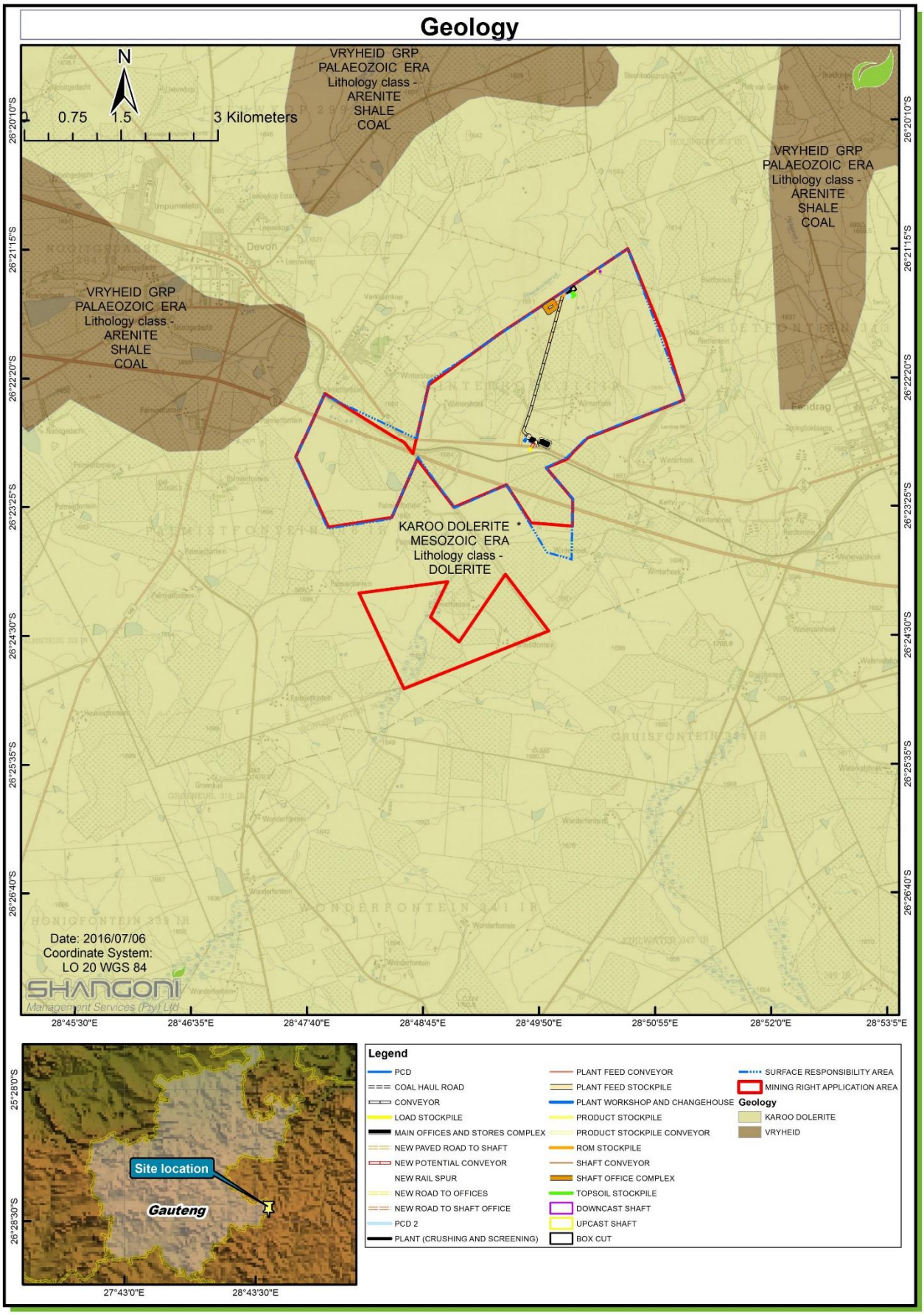

Figure 21: Regional Geology

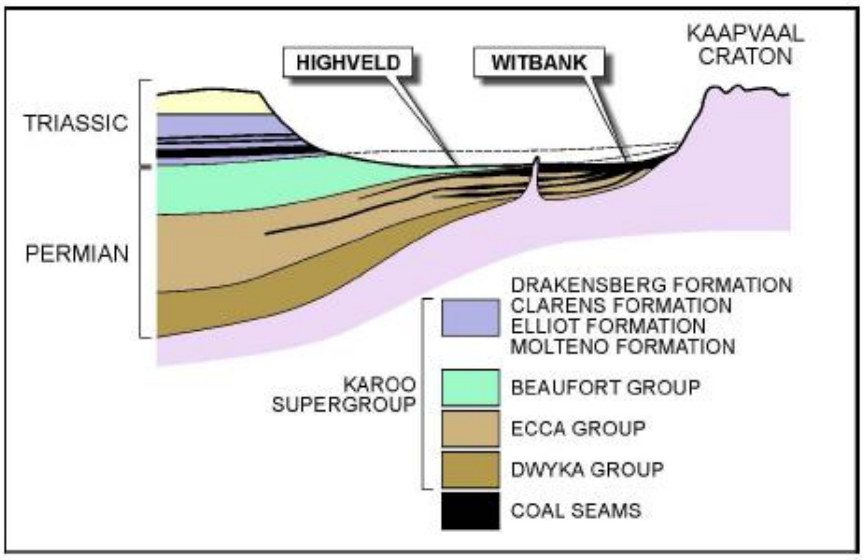

Figure 22: Schematic Representation of Coal Deposition in South Africa

3 Local project deposit geology

The Leslie 2 project area (which forms part of the Highveld Coalfield), has a stratigraphic sequence that is broadly similar to that of the Witbank Coalfield. It is located around the town of Leandra. 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. The 4A Seam, 3 Seam, and 1 Seam may not be present throughout the Coalfield and is too thin to mine.

4 Local geological structure

Dolerite sills of low permeability appear over the study area. The Karoo dolerite, which includes a wide range of petrological facies, consists of an interconnected network sills and it is nearly impossible to single out any intrusive or tectonic event.

Linear dolerite dykes appear are generally absent from the study area. Dolerite sills of various thickness are present at various horizons, and generally the formations overlying the sills are more extensively weathered than those underlying the sill. A very large number of fractures were possibly intruded simultaneously by magma and the dolerite intrusive network acted as a shallow stockwork-like reservoir.

Chapter B: Climate

Information in this section of this report has been obtained from the following documents:

- The report titled: "*Anglo Operations (Pty) Ltd: Leslie 2 – Hydrological Assessment*", dated December 2016 and compiled by Shangoni Management Services (Annexure H3); and
- The report titled: "*Anglo Operations (Pty) Ltd: Leslie 2 – Air quality impact assessment*", dated January 2017 and compiled by Shangoni Management Services (Annexure H6).

1 Temperature

The average monthly summer (approximately 18ºC) and winter (approximately 10ºC) temperatures in the MM5 data set for 2013 to 2015 correlates with the monthly temperatures measured at the Leandra ambient air quality station (refer to Figure 23 below).

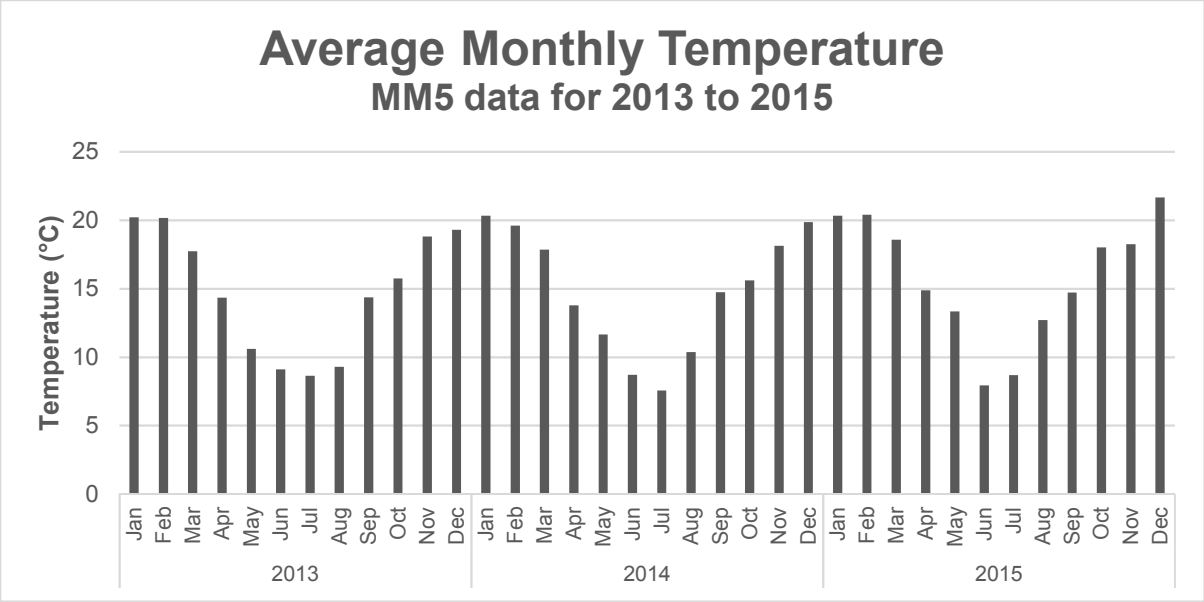

Figure 23: Average monthly temperature (MM5 data from 2013 to 2015).

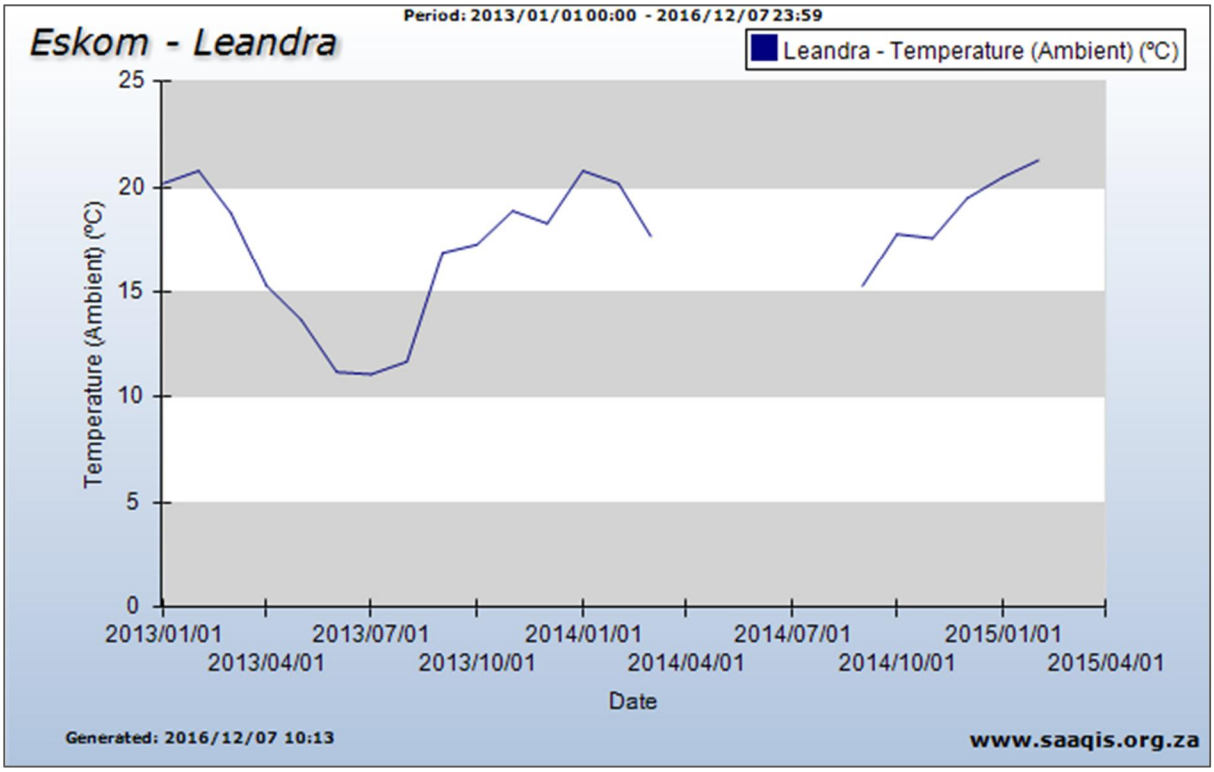

Figure 24: Average monthly temperature (Leandra ambient air quality station).

2 Precipitation and evaporation

Precipitation in the area is highly seasonal with a mean annual rainfall of 723.0 mm according to the rainfall data from the DWS hydrological datasets collected at station B1E004. Most of the rainfall occurs during the summer months with the majority of rain events between September and April. The region receives the highest rainfall in December and the lowest in July. Evaporation is measured at station B1E004 for an S-class pan located approximately 40 km from the site. Table 29 below lists the rainfall and evaporation recordings.

Table 29: Average annual precipitation and evaporation

Date	Rainfall (mm)	Evaporation (mm)
January	108.7	207.1
February	81.5	178.3
March	80.9	165.6
April	38.0	135.7
May	11.1	122.1
June	8.7	91.5
July	2.2	105.1
August	9.0	141.1
September	23.7	182.8
October	97.6	198.4
November	122.3	202.4
December	134.4	204.6
Annual	**723.0**	**2067.2**

3 Extreme weather conditions

According to Mucina & Rutherford, 2006, there is frequent occurrence of frost and large thermic diurnal differences especially in autumn and spring in the Soweto Highveld Grassland area.

4 Wind direction and speed

From the MM5 data it can be derived that the predominant wind field throughout the years 2013 to 2015 is from a north and north north-westerly direction (0º to 357º). During the day time the wind blows mainly from a north north-westerly (342º to 357º) direction and during nigh time the wind blows mainly from a north north-easterly (19º to 29º) direction (Refer to Table 30 below).

Table 30: MM5 wind speed and direction information[55].

Period	Time	Wind speed	Calms	Resultant vector	Direction
2013	00:00-23:00	3.20 m/s	8.32%	9 deg – 32%	N
	06:00-17:00	3.16 m/s	9.34%	347 deg – 32%	NNW
	18:00-05:00	3.25 m/s	7.31%	29 deg – 36%	NNE
2014	00:00-23:00	3.18 m/s	8.13%	9 deg – 31%	N
	06:00-17:00	3.18 m/s	9.18%	349 deg – 31%	NNW
	18:00-05:00	3.17 m/s	7.08%	27 deg – 34%	NNE
2015	00:00-23:00	3.21 m/s	8.47%	4 deg – 39%	N
	06:00-17:00	3.26 m/s	9.36%	345 deg – 41%	NNW
	18:00-05:00	3.16 m/s	7.58%	22 deg – 42%	NNE
2013-2015	00:00-23:00	3.20 m/s	8.31%	7 deg – 34%	N
	06:00-17:00	3.20 m/s	9.29%	347 deg – 34%	NNW
	18:00-05:00	3.20 m/s	7.32%	26 deg – 37%	NNE
2013-2015 Autumn (1 March to 31 May)	00:00-23:00	2.71 m/s	11.28%	1 deg – 29%	N
	06:00-17:00	2.68 m/s	11.87%	342 deg – 30%	NNW
	18:00-05:00	2.73 m/s	10.69%	20 deg – 30%	NNE
2013-2015 Winter (1 June to 31 August)	00:00-23:00	3.18 m/s	8.50%	357 deg – 24%	N
	06:00-17:00	3.44 m/s	7.46%	334 deg – 25%	NNW
	18:00-05:00	2.92 m/s	9.54%	19 deg – 26%	NNE
2013-2015 Spring (1 September to 30 November)	00:00-23:00	3.77 m/s	6.18%	3 deg – 42%	N
	06:00-17:00	3.89 m/s	6.81%	347 deg – 46%	NNW
	18:00-05:00	3.65 m/s	5.56%	21 deg – 42%	NNE
2013-2015 Summer (1 December to 28/29 February)	00:00-23:00	3.14 m/s	7.22%	21 deg – 43%	NNE
	06:00-17:00	2.79 m/s	11.05%	0 deg – 38%	N
	18:00-05:00	3.49 m/s	3.40%	37 deg – 52%	NE

Chapter C: Topography

The topography of the area associated with the proposed location of the Leslie 2 mining operation is flat and gently undulating. Elevations range between 1 640 mamsl and 1 680 mamsl (Figure 25). The undulating topography is largely associated with outcroppings of a dolerite sill, which is more resistant to weathering compared to the adjacent sandstone (Ecca Group). Where the dolerite and the sandstones intersect, springs and resultant streams/rivers occasionally develop.

[55] The resultant vector combines the frequency of winds in each direction to get an "average" wind direction.

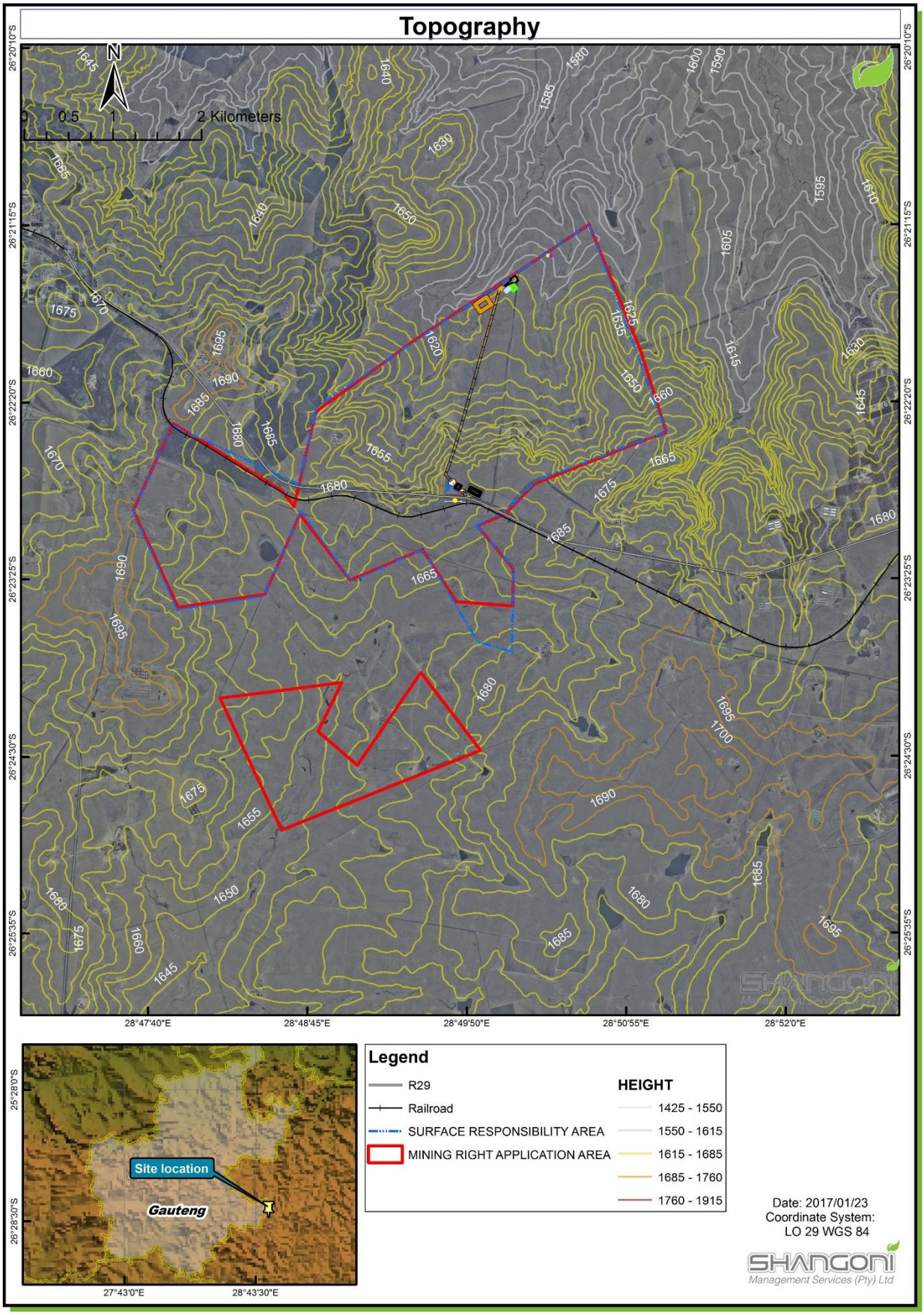

Figure 25: Topography map

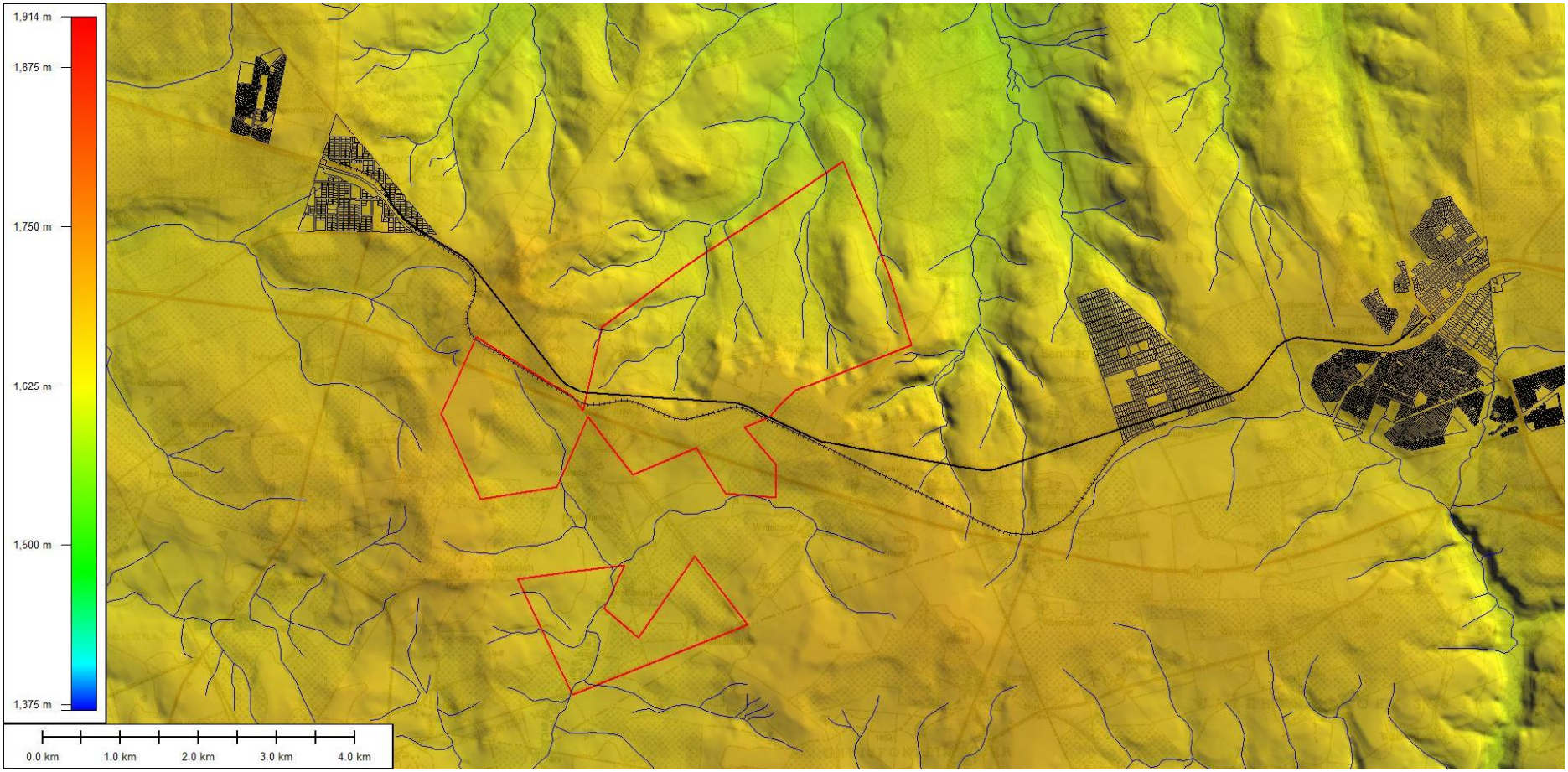

Figure 26: Digital elevation model interpolated from the available topographic data

Chapter D: Soil

Information in this section of this report has been obtained from the following documents:

- The report titled: "*Soil, land use and land capability assessment for the proposed Leslie 2 underground coal mining operation, within the Gauteng Province",* dated January 2017 and compiled by Scientific Aquatic Services (Annexure H1).

2 Dominant soil types

The surveyed catenae within the MRA[56] were classified as part of a vertic topo-sequence, largely dominated by vertic soils of the Arcadia soil form, constituting approximately 68.9% (988 ha) of the MRA, as presented in Figure 27 below. Other identified soil types include the Valsrivier/Sepane, Rensburg, and Mispah/Glenrosa soil forms, constituting approximately 7.3%, 5.0%, and 15.6% of the MRA, respectively. The remainder of the MRA comprises of the severely disturbed Witbank soil forms and some Farm Residential Properties, constituting approximately 1.8 and 1.7% of the MRA, respectively.

The identified Witbank soil forms have been extensively disturbed by anthropogenic activities including historic borrow pit excavations and road developments. These soils correspond with anthrosols in international soil classification terminology, and have been extensively disturbed to such an extent that no recognisable diagnostic soil morphological characteristics could be identified under current conditions.

[56] Mining rights application area

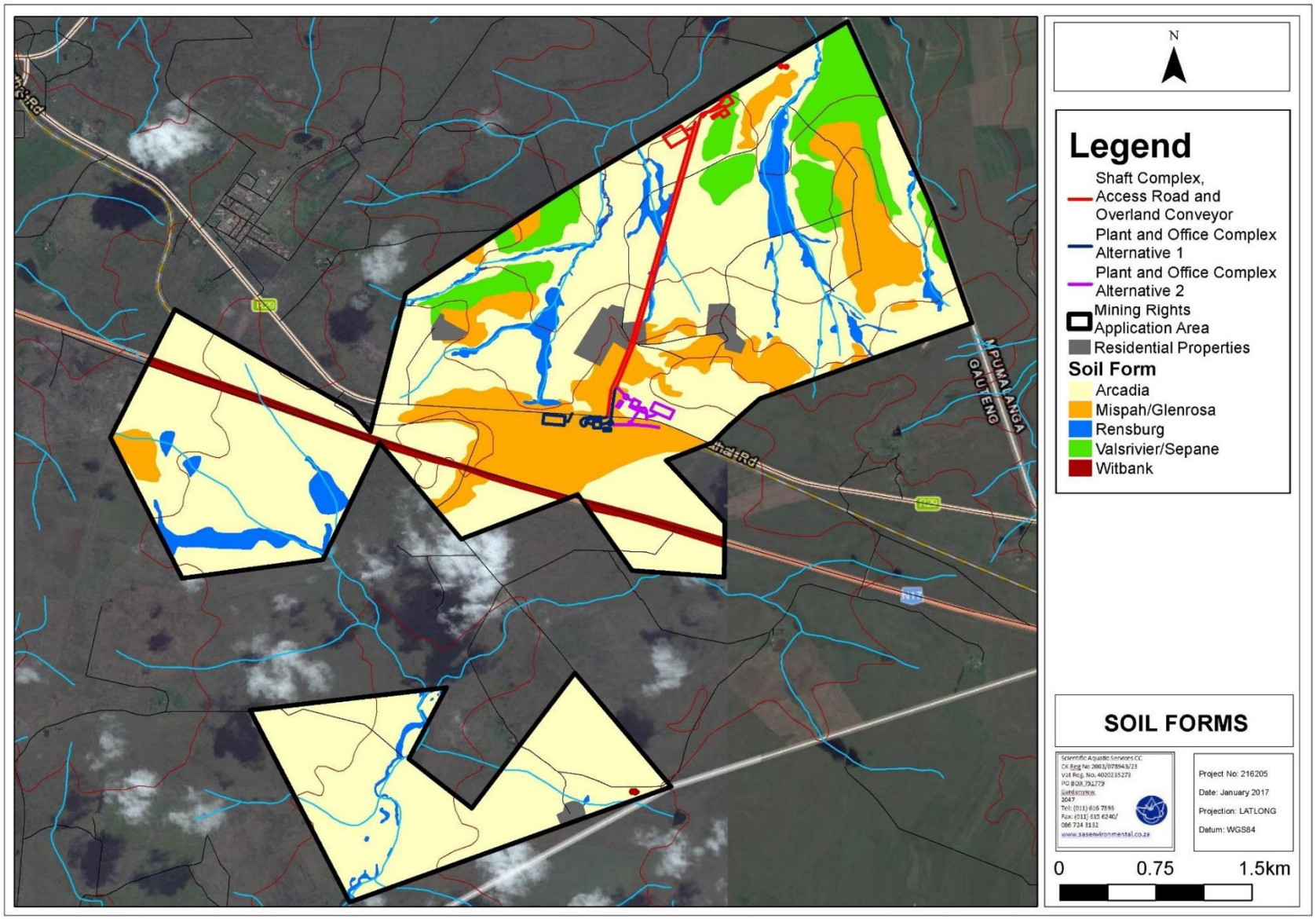

Figure 27: Soil map (SAS, 2017)

Chapter E: Flora

Information in this section of this report has been obtained from the following documents:

- The report titled: "*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 – Section B: Floral Assessment",* dated January 2017 and compiled by Scientific Terrestrial Services (STS) (Annexure H2).

1 Habitat units

The habitat units identified within the Leslie 2 project area include:

- **Open Grasslands Habitat Unit**. This Habitat unit includes natural and rocky grassland areas not previously exposed to agricultural activities and considered to be in a more natural state as opposed to areas classified as Modified Grassland Habitat. Although considered to host increased floral diversity, the species composition and habitat sensitivity of the rocky grassland areas were similar to the natural grassland areas and as such these were considered as a single habitat unit. These areas are dominated by *Themeda triandra*, a grass species found to be abundant in areas that have minimal disturbance, with other grass species representative of the expected Soweto Highveld Grassland vegetation type also present. Grazing within some of these areas were evident, however not to such an extent to significantly alter the floral composition to a severely modified state;
- **Wetland Habitat Unit**. This habitat unit comprises of two freshwater systems, namely the Blesbokspruit system including seep, channelled and unchannelled valley bottom wetlands and the Steenkoolspruit system which includes seep and channelled valley bottom wetlands. In some areas, this habitat unit has been severely affected by anthropogenic activities such as historic cultivation of the wetland areas, as well as overgrazing. Erosion of some sections of the channelled valley bottom wetlands is also evident, particularly in areas where a higher level of disturbance is associated with the surrounding terrestrial area. The systems are however considered to be of increased ecological integrity in areas where the surrounding terrestrial area comprises of open grassland;
- **Rocky Outcrop Habitat Unit**. This habitat unit has a limited extent within the MRA and includes rocky areas associated with exposed rock sheets and shallow soils. Some rocky outcrops are associated with freshwater systems traversing the rocky outcrop habitat area;
- **Modified Grassland Habitat Unit**. This habitat unit is mainly associated with old agricultural fields and secondary grassland areas dominated by *Hyparrhenia hirta* and *Seriphium plumosum* and has a high abundance of alien species such as *Cirsium vulgare* and pioneer grass species. Overgrazing is also evident within this habitat unit;
- **Pastures and Cultivated Land**. These are areas currently under cultivation as crops, or planted pastures mowed regularly for straw bales. The vegetation structure and floral composition of these areas have been altered and provide no natural habitat for indigenous floral species and is considered to be of limited conservation value from a floral perspective; and

- **Transformed Habitat Unit**. The vegetation structure of this habitat unit has been completely altered as it includes farmsteads, outbuildings, roads and other man-made infrastructure areas. As such this habitat unit no longer provides any natural habitat for indigenous floral species and therefore is considered to have no conservation value from a floral perspective.

Figure 28 below provides a general vegetation map of the areas associated with the Leslie 2 project site. Figure 29 shows the Habitat units.

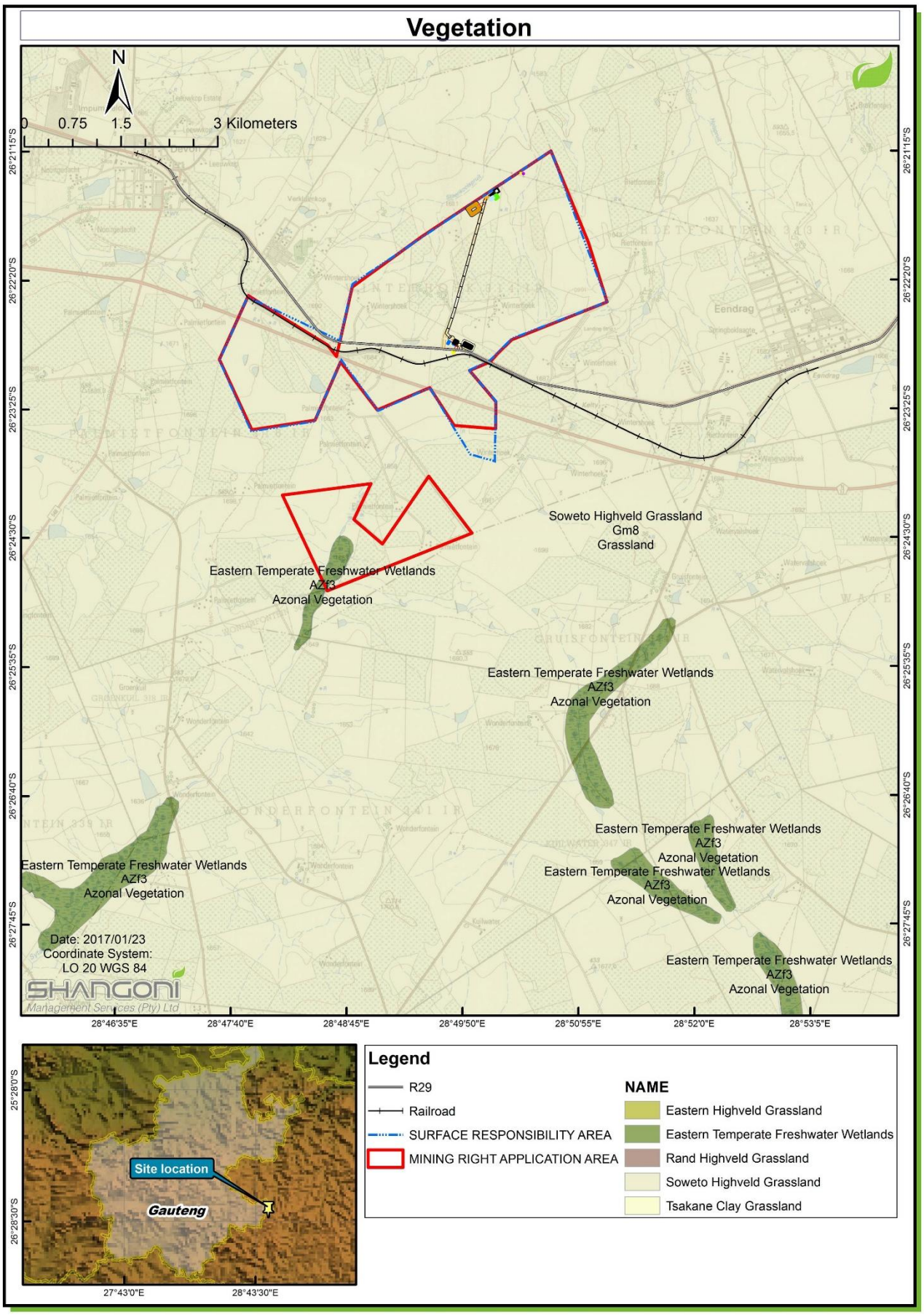

Figure 28: Vegetation map

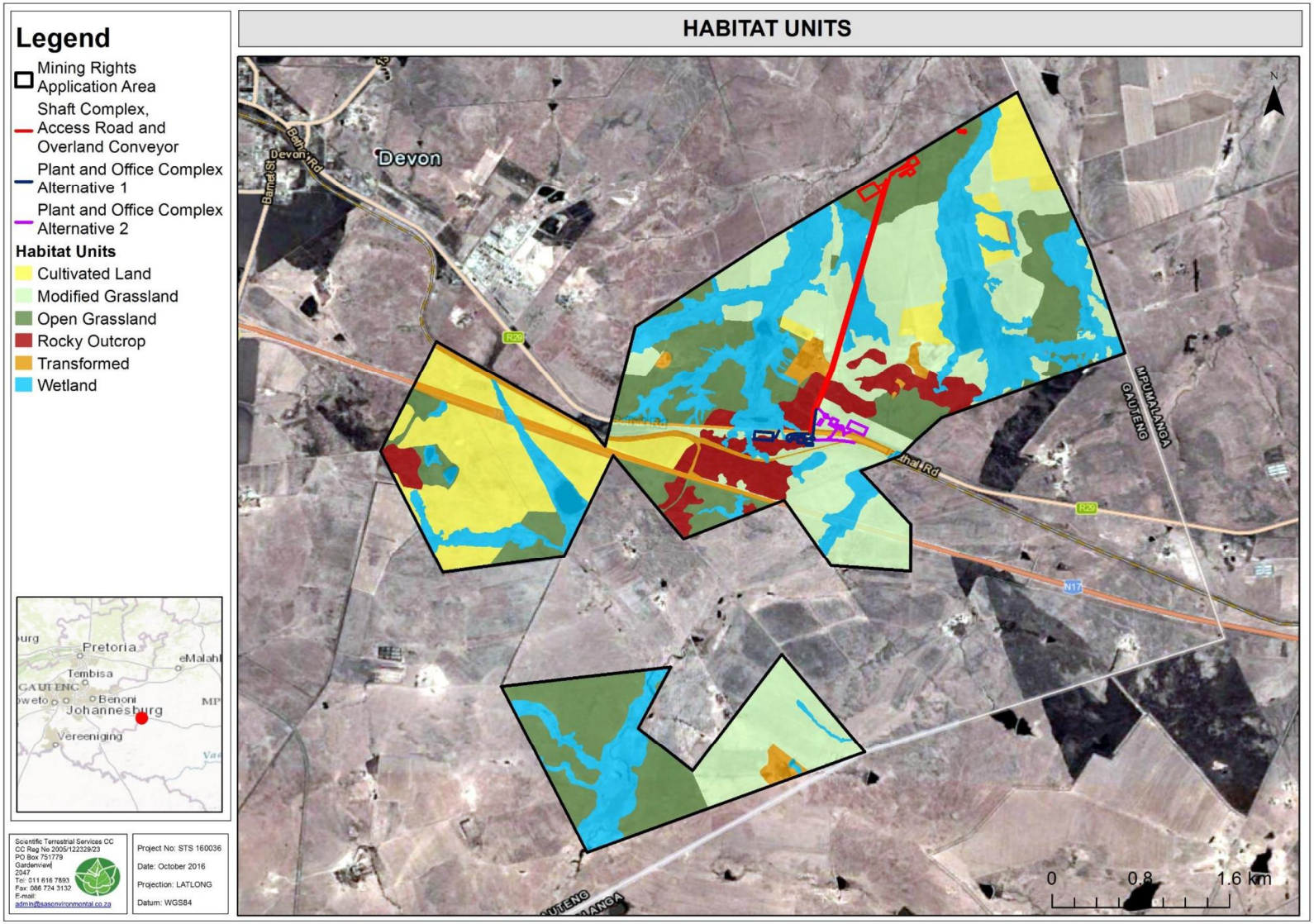

Figure 29: Habitat units (STS, 2017)

2 Floral species of concervation concern

2.1 SANBI and GDARD Floral SCC List

An assessment considering the presence of any plant species of concern, as well as suitable habitat to support any such species was undertaken. The South African National Biodiversity Institute (SANBI) Pretoria Computer Information Systems (PRECIS) floral species of conservation concern (SCC) lists as well as the GDARD conservation lists for the QDS 2628BD was obtained. The floral SCC together with their calculated Probability of Occurrence (POC) are tabulated in Appendix B of Annexure H2. Table 31 below represent those species that obtained a POC score of 60 or more.

Table 31: Floral SCC listed for the QDS that obtained a POC score of 60% or more.

Species	Habitat	POC%	Motivation
rinum bulbispermum	Along rivers and streams or in damp depressions in black clay or sandy soil.	93	The MRA is within the known distribution range of this species and provide suitable habitat for these species within the Wetland Habitat Unit. This species has also previously been recorded during studies conducted by Scientific Aquatic Services (SAS) in the vicinity of the MRA. Crinum spp. were identified on site, however identification to species level was not possible. It is however highly likely that these individuals are either C. bulbispermum or C. macowanii (also a floral SCC, however not listed for the QDS), as both these species was previously recorded within the surrounding area.
Nerine gracilis	Undulating grasslands in damp, moist areas; the plants grow in full sun in damp depressions, near pans or on the edges of streams; grassland, riverbanks, vleis.	73	The MRA provides suitable habitat for this species. Individuals of this species has also been previously recorded within the MRA according to GDARD.
Stenostelma umbelluliferum	Deep black turf in open woodland mainly in the vicinity of drainage lines.	67	The MRA provides suitable habitat within the wetland and open grassland habitat units for the species.
Kniphofia typhoides	Low-lying wetlands and seasonally wet areas in climax Themeda triandra grasslands on heavy black	73	The MRA provides suitable habitat for this species and is located within the species distribution range. According to GDARD

Species	Habitat	POC%	Motivation
	clay soils, tends to disappear from degraded grasslands.		individuals of this species has been recorded 4km north of the MRA.
Hypoxis hemerocallidea	Occurs in a wide range of habitats, from sandy hills on the margins of dune forests to open rocky grassland; also grows on dry, stony, grassy slopes, mountain slopes and plateaux; appears to be drought and fire tolerant.	100	Observed within the Rocky Outcrop, Open Grassland and Modified Grassland Habitat units during the field assessment
Gladiolus robertsoniae	Moist highveld grasslands, found in rocky sites, mostly dolerite outcrops. Corms are wedged in rock crevices. Restricted to seeps and streambanks where moisture is available at the end of the dry season.	80	The MRA is located within the species distribution range, and provides suitable habitat for this species within the wetland and rocky outcrop habitat units. According to GDARD individuals of this

Of the floral SCC listed in the table above, *Hypoxis hemerocallidea* was recorded in the MRA. During the assessment it was evident that the majority of *H. hemerocalllidea* individuals observed have just emerged, and as such it is believed that the majority of the population is still dormant. Crinum spp. have also been observed within the Wetland Habitat Unit, however none of the individuals encountered were flowering and as such identification to species level was not possible. The occurrence of this species within the Wetland Habitat Unit makes it highly likely for either *Crinum bulbispermum* and *C. macowanii* to be located within this habitat unit. Both H*. hemerocallidea, C. bulbispermum* and *C. macowanii* are listed by SANBI as 'Declining', due to harvesting of the plants for medicinal purposes and its general ease of relocation and harvesting. Within the Gauteng Province no buffer zones are required for species considered to be declining (GDACE, 2006). It is therefore recommended that prior to the commencement of site clearance, all of the *H. hemerocallidea* and *Crinum spp.* individuals falling within the development footprint area be relocated to suitable, similar habitat in the vicinity of their original location but outside of the development footprint.

Although no other floral SCC were observed during the field assessment, all of the species scored a POC of more than 60%. This is due to the MRA being located within the distribution range of these species, as well as suitable habitat being available within the MRA. The majority of these species have also previously been recorded within the vicinity of the MRA, either by GDARD, MTPA or during previous studies undertaken by SAS.

Through communication with GDARD, it was determined that *Nerine gracilis* (Vulnerable) occurs within the MRA, while *Gladiolus robertsoniae* (Near Threatened) has been recorded 800m to the east and *Kniphofia typhoides* (Near Threatened) 4 km to the north of the MRA. In line with the Gauteng Red List Plant Species Guidelines (2006) *K. typhoides*, *G. robertsoniae*, and *N. gracilis* are indicated to fall within Priority Grouping A3 (A3 taxa are endemic to Gauteng and two or more other provinces). *Stenostelma umbelluliferum* (Near Threatened) (although not listed by GDARD to occur within the MRA or the QDS, is however listed by SANBI for the QDS) and is also considered an A3 priority species according to GDARD. Should these species be present within the MRA a buffer zone of at least 400m from the edge of these SCC plant species population must be allowed. *Gladiolus robertsoniae* has also been recorded on the farms Leeuwkop 299 IR, Rietfontein 313 IR and Winterhoek 314 IR as determined through communication with MTPA.

2.2 NEMBA Tops Species

One species listed under Section 56(1) the National Environmental Management: Biodiversity Act (Act 10 of 2004): Threatened or Protected Species (TOPS) Regulations (GN 255 of 2015) and published under the Publication of Lists of Species that are Threatened or Protected, Activities that are Prohibited and Exempted from Restriction (GN 256 of 2015), was encountered within the study area, namely *Pelargonium sidoides*.

In terms of these Regulations, the following restricted activities involving wild / wild-sourced specimens apply:

- Buying, receiving, giving, donating;
- Accepting as a gift;
- Importing into the Republic;
- Conveying, moving or otherwise;
- Translocating; and
- Having in possession or exercising physical control over.

Pelargonium sidoides is a very widespread species with an Extent of Occurrence (EOO) of more than 600 000 km² and is considered a common species across eastern South Africa and Lesotho. Its tubers are however wild-harvested for export for the international herbal medicine trade. Population decline is also taking place as a result of habitat conversion for crop cultivation and habitat degradation due to livestock overgrazing, with these threats currently more severe than the threat of harvesting (De Castro et al., 2012).

In 2010, a detailed survey across this species' range showed that it is still abundant in many parts of its range and only a very small proportion (<5%) of the population is being impacted by harvesting. In addition, plants are able to coppice after harvesting and the majority of plants recover from harvesting (De Castro et al., 2012).

The NEMBA Biodiversity Management Plan for *Pelargonium sidoides* in South Africa 2011 – 2020 (GN 433 of 2013) was developed with the main aim of regulating trade and harvesting of the species. Should this species be encountered within the infrastructure footprint areas, the Department of Environmental Affairs (DEA) should be contacted to obtain a permit for the relocation of the species to suitable similar habitat within the vicinity of is original location.

3 Alien and invasive plant species

A list of dominant alien floral species present within the MRA, is listed below.

Table 32: Dominant alien floral species identified within the project site

Species	English name	Category[57]
Trees		
Agave americana	American Aloe	Not Listed
Eucalyptus grandis	Saligna Gum	1b
Gleditsia triacanthos	Honey Locust	1b
Salix babylonica	Weeping Willow	Not listed
Forbs		
Argemone ochroleuca	Mexican Poppy	1b
Bidens pilosa	Common Blackjack	Not Listed
Centella asiatica	Marsh Pennywort	Not Listed
Ciclospermum leptophyllum	Wild Celery	Not Listed
Cirsium vulgare	Spear Thistle	1b
Datura stramonium	Common Thorn-Apple	1b
Gomphrena celosioides	Prostrate Globe Amaranth	Not Listed
Hibiscus trionum	Bladder Hibiscus	Not Listed
Hypochaeris radicata	Hairy Wild Lettuce	Not Listed
Oenothera rosea	Rose Evening Primrose	Not Listed
Oenothera tetraptera	White Evening Primrose	Not Listed
Sckuhria pinnata	Dwarf Marigold	Not listed
Senecio consanguineous	Starvation Senecio	Not Listed
Tagetes minuta	Tall Khakiweed	Not Listed
Taraxacum officinale	Common Dandelion	Not listed
Verbena bonariensis	Purple Top	1b
Xanthium strumarium	Large Cocklebur	1b

[57] Species falling within an alien invasive category as per the National Environmental Management: Biodiversity Act (Act 10 of 2004): Alien and Invasive Species Regulations, 2016.

Species	English name	Category[57]
Grasses		
Pennisetum clandestinum	Kikuyu	1b

Alien floral invasion within the MRA is considered to be moderate to low within the Open Grassland, Wetland and Rocky Outcrop Habitat Units, but very high within the Pastures and Cultivated Lands, Modified Grassland and Transformed Habitat Units. Alien and weed species encountered within the Infrastructure Laydown areas are to be removed in order to comply with the NEMBA (Act 10 of 2004): Alien and Invasive Species Regulations (GN 586 of 2016) and removal and control of invasive plant species should take place throughout the pre-construction, construction, operational, decommissioning and rehabilitation phases.

4 Medicinal plants

A moderate diversity of medicinal species is present within the MRA and, of which a number of medicinal species present are also considered to be floral SCC. A list of prominent medicinal floral species encountered during the field assessment is provided in Table 10 of Annexure H2 – Floral Assessment.

4 Sensitivity mapping

The figure below conceptually illustrates the areas considered to be of increased ecological sensitivity. The areas are depicted according to their sensitivity in terms of the presence or potential for floral SCC, habitat intactness and levels of disturbance, threat status of the habitat type, the presence of unique landscapes and overall levels of diversity. Table 11 in Annexure H2 – Floral Assessment presents the sensitivity of each identified habitat unit along with an associated conservation objective and implications for development.

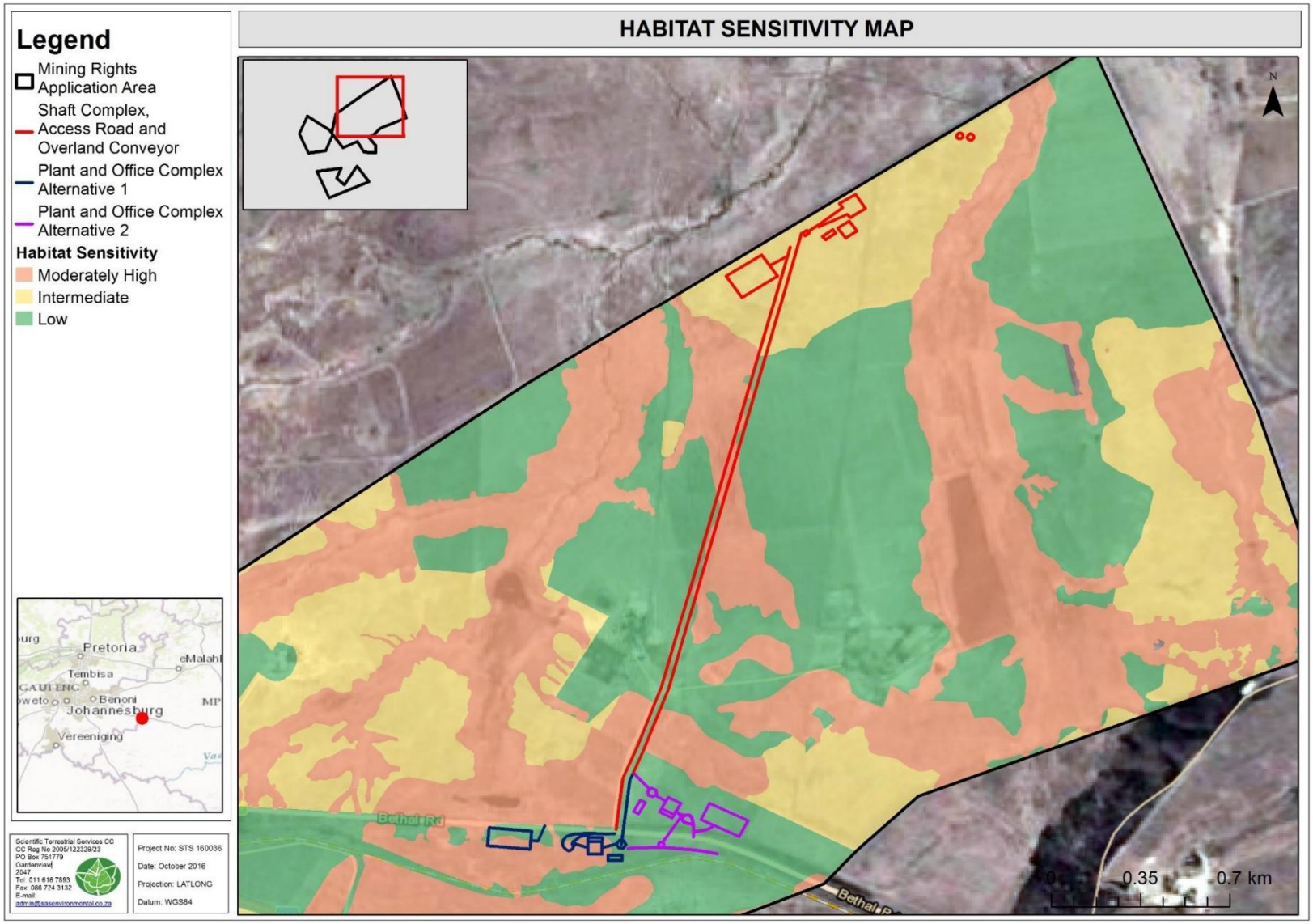

Figure 30: Habitat Sensitivity map (STS, 2017)

Chapter F: Fauna

Information in this section of this report has been obtained from the following documents:

- The report titled: "*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 – Section C: Faunal Assessment",* dated January 2017 and compiled by Scientific Terrestrial Services (STS) (Annexure H2).

1 Faunal species of concervation concern

During field assessments of limited duration, it is not always possible to identify or observe all species within an area, largely due to the secretive nature of many faunal species, possible low population numbers or varying habits of species. As such, to specifically assess an area for faunal SCC, a Probability of Occurrence (POC) matrix is used, utilising a number of factors to determine the probability of faunal SCC occurrence within the MRA. Species listed in Appendix C of Annexure H2, whose known distribution ranges and habitat preferences include the MRA were taken into consideration. The species listed below are considered to have a significant probability of occurring within the MRA.

Table 33: Faunal SCC Probability of Occurrence Score (POC) of 60 % and greater than for the MRA.

Species	Common Name	POC%
Mammals		
Proteles cristatus	Aardwolf	60
Poecilogale albinucha	African striped weasel	65
Aonyx capensis	Cape clawless otter	70
Rhinolophus blasii empusa	Peak-saddle horseshoe bat	60
Cloeotis percivali australis	Short-eared trident bat	60
Atelerix frontalis	Southern African hedgehog	100
Lutra maculicollis	Spotted-necked otter	60
Myotis welwitschii	Welwitsch's hairy bat	60
Mystromys albicaudatus	White-tailed Mouse	70
Avifauna		
Tyto capensis	African Grass-Owl	100
Circus ranivorus	African Marsh-Harrier	70
Glareola nordmanni	Black-winged Pratincole	65
Circus maurus	Black Harrier	85
Anthropoides paradiseus	Blue Crane	85
Eupodotis caerulescens	Blue Korhaan*	100

Species	Common Name	POC%
Gyps coprotheres	Cape Vulture	75
Neotis denhami	Denhams Bustard	75
Phoenicopterus roseus	Greater Flamingo*	100
Phoenicopterus minor	Lesser Flamingo	80
Polemaetus bellicosus	Martial Eagle	75
Mirafra cheniana	Melodious Lark	75
Circus pygargus	Montagu's Harrier	65
*Circus macrourus**	Pallid Harrier	65
*Sagittarius serpentarius**	Secretary bird	90
Geronticus calvus	Southern Bald Ibis	65
Bugeranus carunculatus	Wattled Crane	85
Eupodotis senegalensis	White-bellied Korhaan	75
Reptiles		
Homoroselaps dorsalis	Striped Harlequin Snake	65
Pyxicephalus adspersus	Giant Bullfrog	65

*Species observed within the study area or are likely to occur.

From the table above of listed faunal SCC, it is evident that the MRA has the potential to provide habitat for a number of faunal SCC. The MRA lies within the Devon Grassland IBA, which is inhabited by a large diversity of avifaunal species, notably specialist grassland and wetland species. Two avifaunal SCC namely *Eupodotis caerulescens* (Blue Korhaan) and *Phoenicopterus roseus* (Greater Flamingo) were observed at the time of the field assessment. Other avifaunal species listed for the IBA, but not observed during the field assessment have however been observed by local birding groups, are also recorded in SABAP 1 and 2, and are mentioned by Birdlife South Africa (BLSA) as being present in the Devon Grassland IBA. As such, these species are presumed to also utilise and inhabit the MRA and surrounding area.

Overall, the MRA is considered to be of high conservation value, as it provides suitable habitat for a variety of species, with the grassland and wetland areas providing suitable breeding and foraging sites for avifaunal SCC.

2 Sensitivity mapping

From a faunal perspective, all habitat units are regarded as having high ecological sensitivity from an avifaunal SCC perspective, with the Wetland and Open Grassland habitat units having increased ecological importance for all faunal species.

Table 34: A summary of the sensitivity of each habitat unit and implications for development

Habitat	Sensitivity	Conservation Objective	Development Implications
Cultivated Land, Modified Grassland, Open Grassland and Wetland	High	Conserve and enhance the biodiversity of the habitat unit, no-go alternative must be considered.	Any disturbance of sensitive faunal habitat and SCC must be actively avoided. In this regard, maintaining migratory corridors and connectivity in the wetland areas is deemed essential. Sensitive faunal habitat adjacent to the proposed development footprint areas must be designated as No-Go areas and no mining vehicles, personnel, or any other mining related activities are to encroach upon these areas.
Rocky Outcrop	Intermediate	Conserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential.	Any new development in this habitat unit should be limited, and the development footprint should be kept as small as possible. Care must be taken to limit edge effects on the surrounding natural areas.
Transformed	Low	Optimise development potential.	Activities within this habitat unit must be optimised and limited to the existing disturbance footprint. Care must be taken to limit edge effects on the surrounding natural areas.

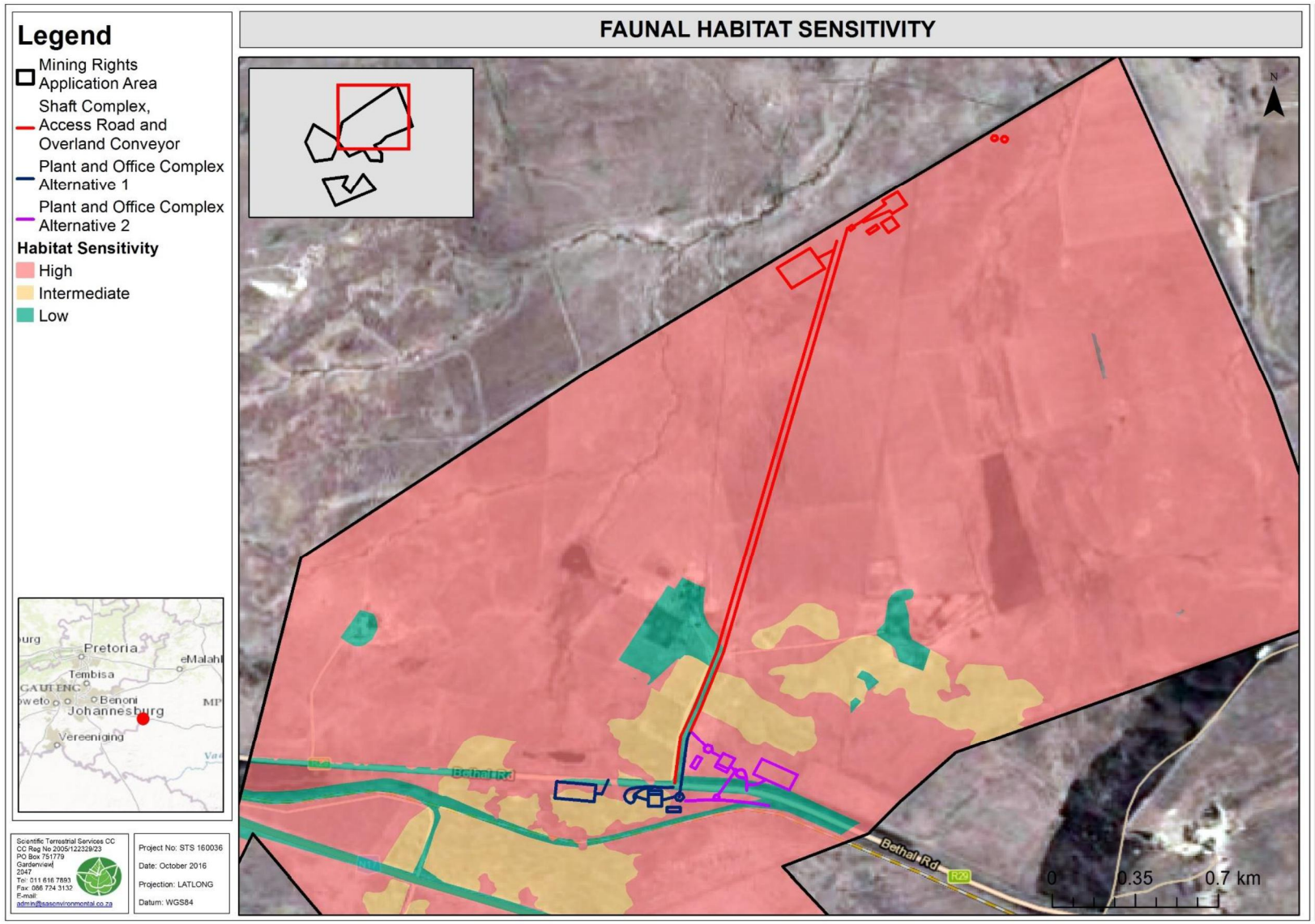

Figure 31: Faunal Habitat Sensitivity map (STS, 2017)

Chapter G: Surface Water

Information in this section of this report has been obtained from the following documents:

- The report titled: "*Anglo Operations (Pty) Ltd: Leslie 2 – Hydrological Assessment*", dated December 2016 and compiled by Shangoni Management Services (Annexure H3); and
- The report titled: "*Geohydrological EIA in support of a mining right application, environmental authorisation, and waste management licence for the Leslie 2 Project*", dated December 2016 and compiled by Shangoni AquiScience (Annexure H5).

1 Catchments

The proposed Leslie 2 project will be situated in the primary catchment of the Wilge River and located in the quaternary catchments referred to as the C21A and B20E as defined by the DWS. The applicable water management area is referred to as the Vaal Water Management Area.

The catchment is 14.05 km^2 in size and the Steenkoolspruit drains in a northerly direction ear the proposed Leslie 2 project and is joined by several tributaries before reaching the Wilge River. The N17 runs in a general east-west direction across the southern most boundary of the catchment. Approximately 0.62km^2 of the total catchment is located south of the N17 and runoff from this part of the catchment passes through culverts underneath the N17 to the main drainage channels (EVN, 2016).

The study catchment was further sub-divided into a series of five sub-catchments along internal watershed boundaries. Runoff from each of these sub-catchments were determined and input into the HEC-RAS hydraulic model.

The areas of the different sub-catchments are shown in Table 35 below and illustrated in Figure 33 below.

Table 35: Sub-catchment areas

Sub-catchment	Area (km^2)
SC1	3.53
SC2	4.38
SC3	3.02
SC4	0.45
SC5	2.65

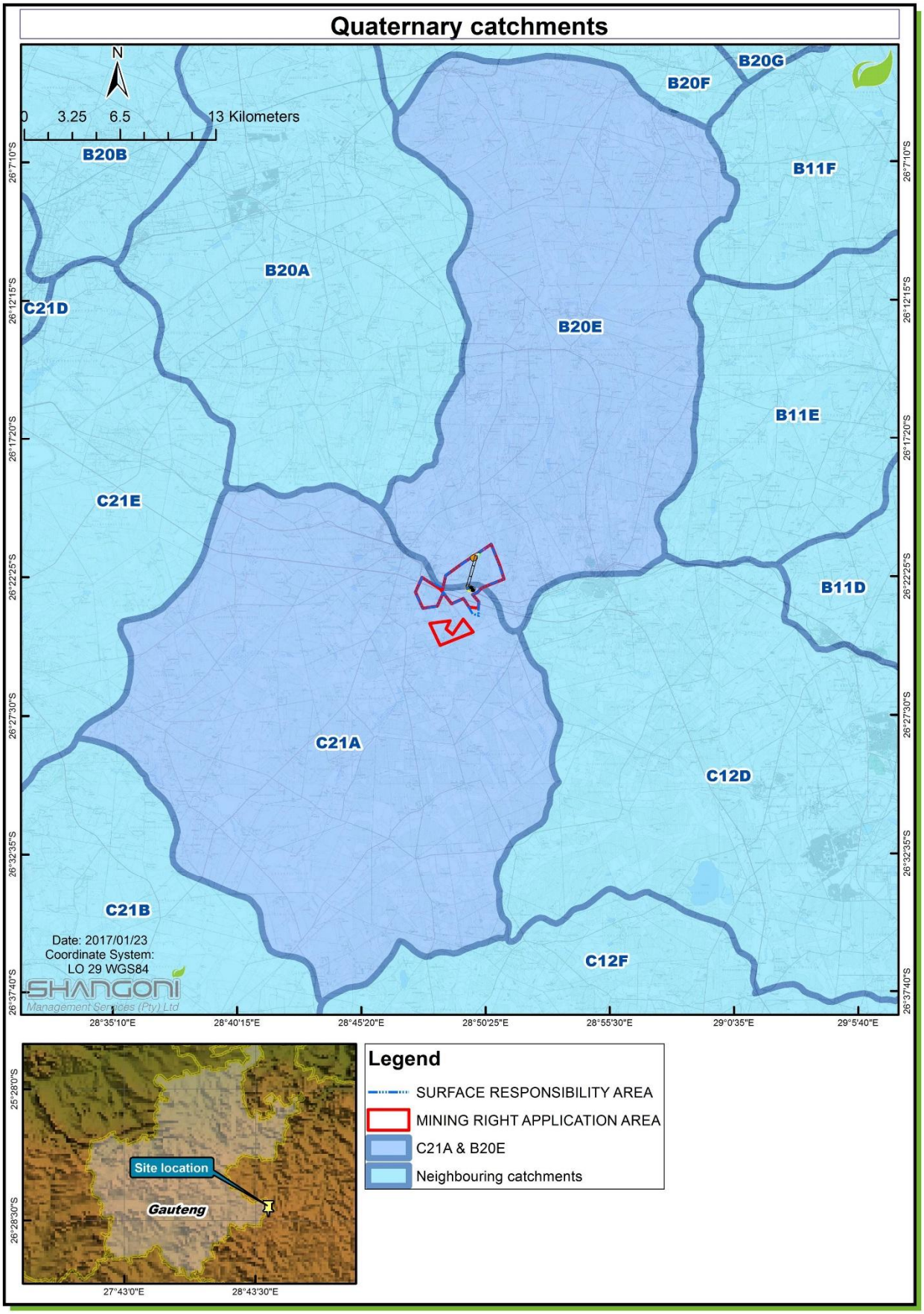

Figure 32: Quaternary catchments

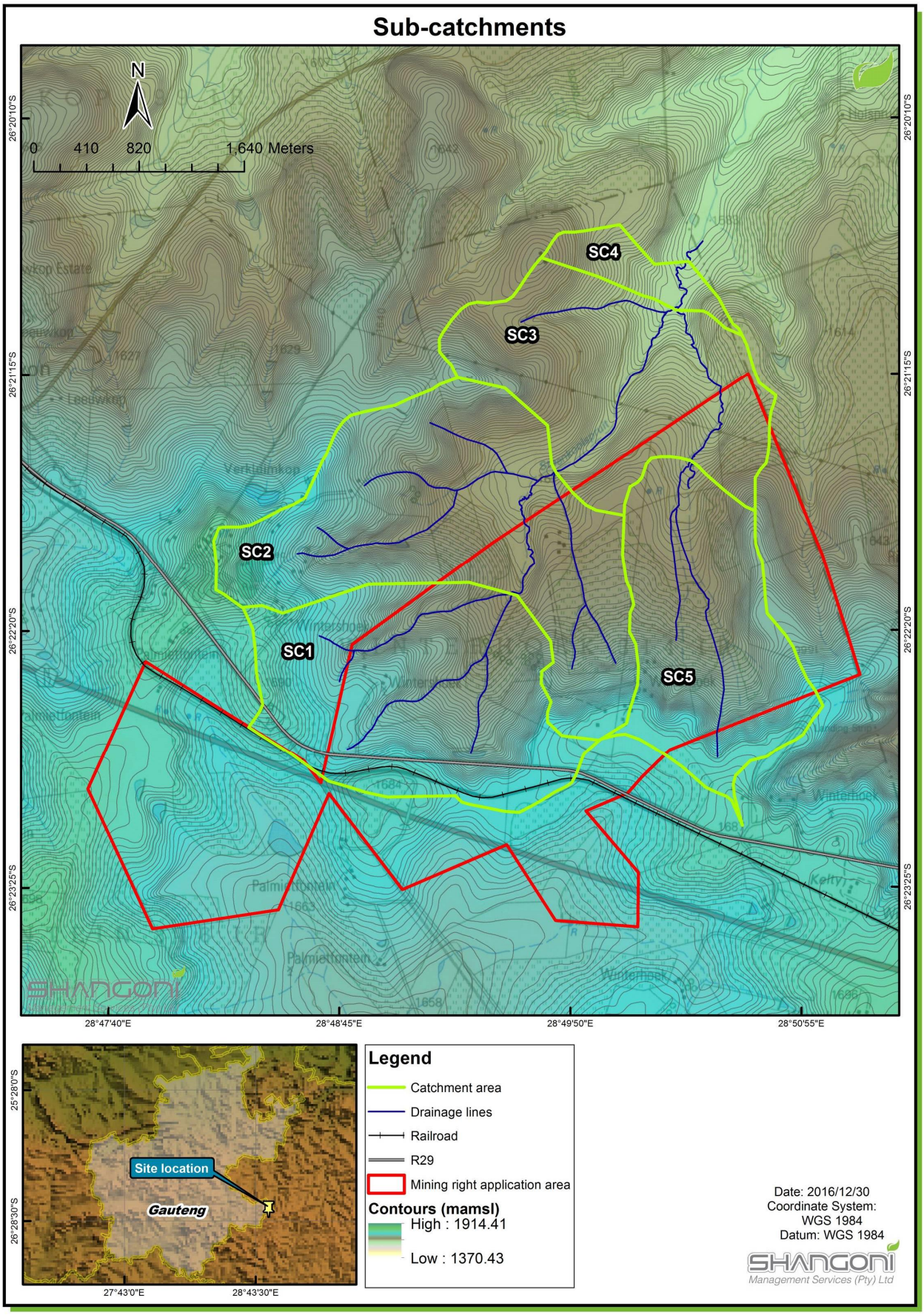

Figure 33: Sub-catchments

2 Estimated peak flows

The peak discharges and catchment responses for the different sub-catchments are summarised in Table 36 below:

Table 36: Peak discharge volumes

	SCS Lag Equation		Schmidt-Schulze Equation		Rational Method	Alternative Rational Method	Adopted Discharge
Sub-catchment	**Catchment response (h)**	**100 yr peak discharge (m^3/s)**	**Catchment response (h)**	**100 yr peak discharge (m^3/s)**	**100 yr peak discharge (m^3/s)**	**100 yr peak discharge (m^3/s)**	**100 yr peak discharge (m^3/s)**
SC1	1.11	30.2	0.9	37	30	27	37
SC2	1.12	37.7	0.9	44.9	33	30	44.9
SC3	1.03	25	0.81	30	25	23	30
SC4	0.77	10.4	0.55	13.3	5	4	13.3
SC5	1.29	20.8	3	30	24	21	30
Total		118.2		155.2			

3 Flood line delineation

The catchment is characterised by large areas of sheetflow accumulating into several overland flow paths which drains into the two main drainage channels.

The calculated 1:100-year flood was superimposed upon the proposed Leslie 2 project site for the two alternative infrastructure layout options. The 1:100 flood line for the (preferred) Plant Location Alternative 02 (PL02) and Ventilation Shaft Location Alternative 02 (VL02) can be observed in Figure 34. Several minor tributaries were identified within the mining right application area. Flood lines for these tributaries were not delineated since their catchments are small and the required 32-meter environmental buffer will suffice as indication of maximum flood levels during the 1: 100-year event.

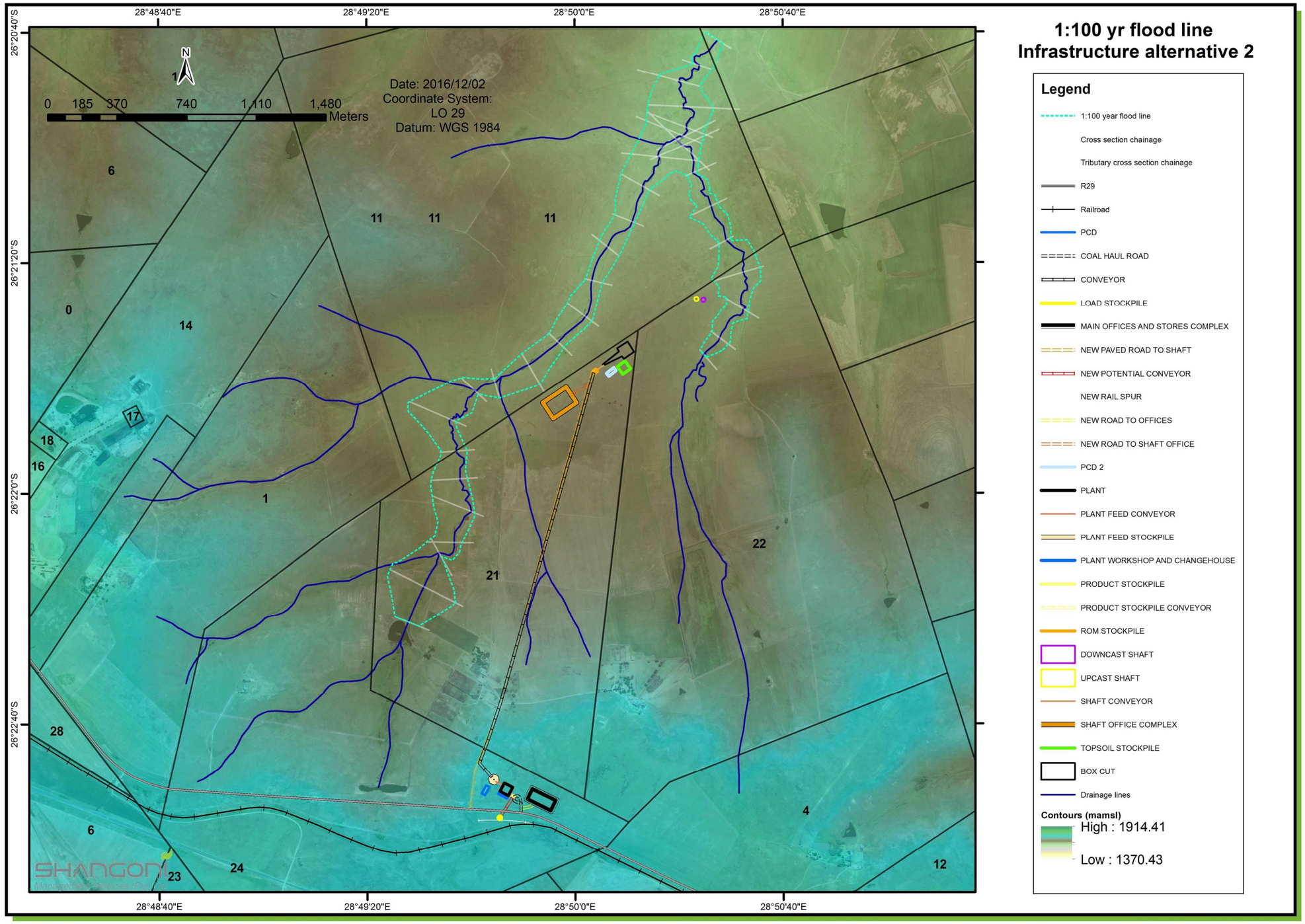

Figure 34: 1:100 year flood line: Plant infrastructure alternative 2

4 Receptors

Receptors that may be directly or indirectly affected by adverse changes to the quantity or quality of surface water include:

- Fountains
  - Several fountains occur on geological contact zones (dolerite/sandstone). These are typically source/s for the streams draining the project area.
  - Significant flow only occurs during the summer rainfall season.
- Wetlands.
  - Wetlands are a common occurrence in the immediate and greater vicinity of the project area.
- Rivers/streams
  - Three river/spruit systems were identified within the greater project area. These are the i) Steenkoolspruit and ii) the Wilge River both feeding water to the greater Olifants River catchment, and the iii) Blesbokspruit forming part of the Vaal River catchment.

The farmers and communities are dependent on the groundwater (and surface water) resources for everyday domestic purposes and for their livelihoods as groundwater and surface water from fountains are their sole source of water.

5 Surface water quality

Thirteen (13) surface water localities, that included fountains, rivers/streams and dams/ponds were surveyed. Samples from these localities, where possible, were taken for hydro-chemical analysis.

The survey information is displayed in Table 37 and a map showing the location of the surface water points and fountains in Figure 35. Table 38 below provides the surface water quality results.

Table 37: Surveyed water resource localities during the Leslie 2 hydrocensus (September 2016)

Borehole ID	Coordinates		Elevation (mamsl)	Depth (m)	Water level (mbcl)	Collar height (m)	Hydraulic head (mamsl)	Owner	Equipment	Application
Surface water/Fountain										
F01	-26.37867	28.82291	1655.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (fountain)
F02	-26.37732	28.81753	1661.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (fountain)
F03	-26.37374	28.81383	1665.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (fountain)
F04	-26.37193	28.82519	1635.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (fountain)
F05	-26.37949	28.85113	1672.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water-Dry (fountain)
F06	-26.38090	28.85179	1677.00	N/A	N/A	N/A	N/A	N/A	N/A	Not in use
F07	-26.38120	28.85201	1657.00	N/A	N/A	N/A	N/A	N/A	N/A	Not in use
F08	-26.37681	28.86011	1629.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (fountain)
F09	-26.37318	28.86174	1621.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (fountain)
Fountain_Louw	-26.41538	28.79221	1666.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water-Dry (fountain)
SW01	-26.38357	28.79677	1689.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (dam)
SW02	-26.38527	28.79890	1684.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (dam)
SW03	-26.39855	28.81805	1664.00	N/A	N/A	N/A	N/A	N/A	N/A	Stock Water (dam)

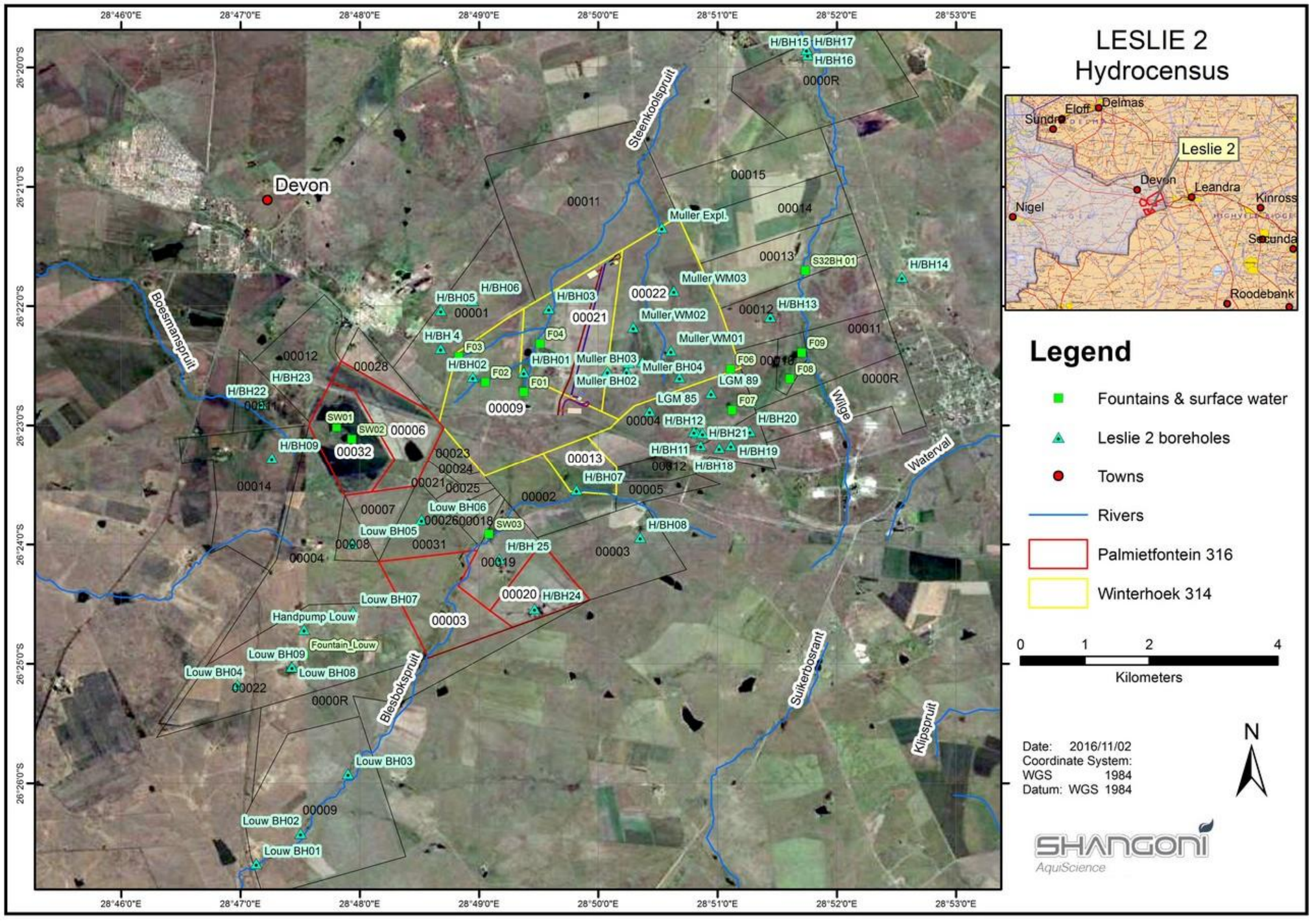

Figure 35: Surveyed boreholes, surface water points and fountains

Table 38: Surface water quality results

Site Name	SANS 241: 2015	F01	F02	F03	F04	F06	F07	F08	SW01	SW02
pH	≥5 to ≤9.7	8.18	8.00	7.77	7.37	7.30	8.05	8.66	7.48	8.28
EC (mS/m)	≤170	75.60	82.50	92.70	92.60	82.50	69.30	68.60	55.60	**265.0**
TDS (mg/l)	≤1200	488.00	542.00	587.00	584.00	557.00	477.00	431.00	331.00	**1775.00**
Ca (mg/l)	-	70.10	87.10	99.10	90.00	99.30	78.80	74.80	45.50	67.00
Mg (mg/l)	-	64.40	63.10	62.50	66.30	58.40	47.80	48.30	35.60	200.00
Na (mg/l)	≤200	18.30	22.50	38.30	30.90	19.60	17.10	21.60	21.70	**362.00**
K (mg/l)	-	0.64	0.45	1.87	1.21	0.10	0.43	0.50	9.24	11.10
MALK (mg/l)	-	363.00	381.00	389.00	454.00	419.00	314.00	284.00	222.00	968.00
Cl (mg/l)	≤300	3.85	6.56	19.60	38.40	10.70	24.80	10.10	27.80	294.00
SO_4 (mg/l)	≤500	108.00	103.00	124.00	78.50	112.00	115.00	100.00	50.30	246.00
NO_3-N (mg/l)	≤11	0.29	6.03	0.83	0.26	<0.19	0.25	0.32	0.39	0.23
N_Ammonia (mg/l)	≤1.5*	0.11	0.14	0.01	0.53	0.11	0.10	0.06	**2.65**	0.65
PO_4 (mg/l)	-	<0.01	<0.01	<0.01	<0.01	0.04	0.10	0.05	0.04	0.44
F (mg/l)	≤1.5	<0.26	<0.26	0.28	0.29	<0.26	<0.26	0.30	0.42	0.80
Al (mg/l)	≤0.3#	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.26	0.29
Fe (mg/l)	≤2	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.22	0.26
Mn (mg/l)	≤0.3*	<0.001	<0.001	**0.575**	<0.001	<0.001	<0.001	<0.001	**1.09**	**5.47**
Cu (mg/l)	≤2.0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ni (mg/l)	≤0.07	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Zn (mg/l)		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Pb (mg/l)	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
WRC Classification		Good (class01)		Marginal (class2)	Good (class01)		Ideal (class0)		Marginal (class2)	Poor (class3)
Classification based on:		EC/TDS		Mn	EC/TDS		-		Ammonia, Mn	Mn

Chapter H: Aquatic environment

The information contained in this section of this report was sourced from the following document:

- The report titled: "*Aquatic and wetland assessment as part of the environmental assessment and authorisation process for the Leslie 2 underground coal mining operation, Gauteng Province*", dated November 2016 and compiled by Scientific Aquatic Services (Annexure H4)

Table 39 below presents geographic information with regards to the monitoring points on river systems, which had sufficient flow to support an aquatic community, associated with the MRA. Figure 36 visually presents the locations of the various points along the various river systems, assessed.

Table 39: Location of the aquatic assessment points with co-ordinates

Site	Detailed site description	GPS coordinates	
		South	East
LL1	Representative site situated in the upper reaches of a tributary of the Steenkoolspruit on the North-Western portions of the Farm Winterhoek.	26°21'36.5"	28° 50'24.0"
LL2	Representative site situated in the upper reaches of a tributary of the Steenkoolspruit and located centrally within the MRA on the Farm Winterhoek.	26°22'52.0"	28° 49'23.1"
LL5	Upstream site situated in the upper reaches of the Blesbokspruit, which flows through the central portion of the MRA on the Farm Palmietfontein.	26°24'05.6"	28°48'53.3"
LL6	Downstream site situated in the upper reaches of the Blesbokspruit, which flows through the central portion of the MRA on the Farm Palmietfontein.	26°24'50.8"	28°48'37.1"

1. Aquatic assessment points

The sites selected for aquatic biomonitoring were all visually assessed along with the other potential assessment points visited. The Invertebrate Habitat Assessment System (IHAS), Intermediate Habitat Integrity Assessment (IHIA), fish Habitat Cover Ratings (HCR), the South African Scoring System version 5 (SASS5) and Macro-Invertebrate Risk Assessment Index (MIRAI) (for the assessment of the macro-invertebrate community), and the Fish Risk Assessment Index (FRAI) (in order to assess the risks to the fish community) were employed on selected points The protocols of applying the indices were strictly adhered to and all work was carried out by a South African River Health Program (SA RHP) accredited assessor.

Table 40 below presents geographic information with regards to drainage lines and other aquatic resources only visually assessed.

Table 40: Location of the various drainage lines and other aquatic resources only visually assessed within and in the vicinity of the Farm Winterhoek and Farm Palmietfontein MRAs.

Site	Detailed site description	GPS coordinates	
		South	East
LL POI 2	Situated in the upper reaches of the eastern tributary of the Blesbokspruit on the northern border of the Farm Palmietfontein MRA.	26°24'2.61"	28°48'57.28"
LL POI 3	Situated in the upper reaches of the western tributary of the Blesbokspruit. This site is situated downstream of site POI 4 on the northern border of the Farm Palmietfontein MRA.	26°24'1.58"	28°48'52.10"
LL3 (LL POI 7)	Situated on the western border of the Farm Winterhoek MRA.	26°22'24.84"	28°48'53.01"
LL4	A dam situated on the south-western portion of the Farm Winterhoek MRA.	26°23'17.31"	28°48'26.44"
LL POI 4	A drainage line/ wetland observed downstream of the LL 4 site dam.	26°23'29.55"	28°48'30.80"
LL POI 5	A drainage line which occurs in the upper reaches of a tributary of the Blesbokspruit on the central southern border of the Farm Winterhoek MRA.	26°23'21.05"	28°49'17.87"
LL POI 6	A drainage line which occurs in the upper reaches of a tributary of the Blesbokspruit on a south eastern portion of the Farm Winterhoek MRA, adjacent to the N17.	26°23'23.86"	28°49'47.47"
LL POI 8	This site occurs on the Steenkoolspruit tributary, downstream of the LL1 site on the northern border of the Farm Winterhoek MRA.	26°22'24.84"	28°48'53.01"

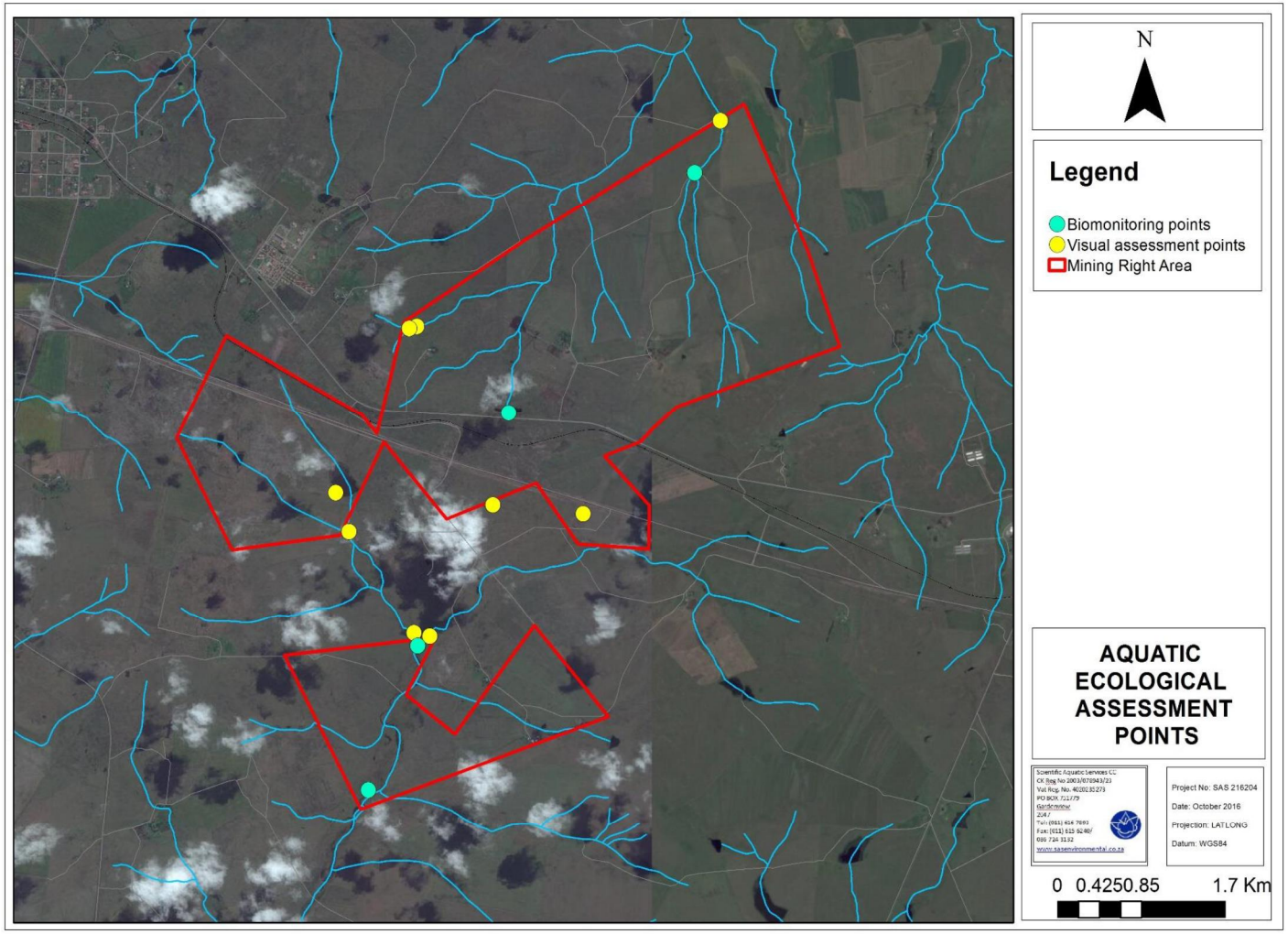

Figure 36: Aquatic ecological assessment points and MRA presented on a digital satellite image (SAS, 2016)

2. Aquatic assessment results synopsis and conclusion

2.1 Points of interest visually assessed

Sites within the farm Winterhoek and farm Palmietfontein MRAs only visually assessed were affected by the following impacts: Agricultural activities, with specific reference to abstraction and livestock grazing. In addition, many of the sites were affected by erosion and incision and subsequent impacts related to sedimentation and alterations to the stream bed substrates were observed. The streams in these areas are 1st order tributaries and drainage lines, which were mostly dry at the time of the assessment as a result of the ongoing drought conditions.

2.2 Biomonitoring assessment results for the aquatic resources on the farms Winterhoek and Palmietfontein (within the project site)

Based on the observations of the aquatic assessment of the sites observed on the Farm Winterhoek and the Farm Palmietfontein, it is evident that habitat diversity, availability as well as habitat provision for aquatic communities is deemed inadequate for supporting diverse and abundant aquatic communities, as a result of the ongoing drought conditions and extremely low flows at the time of the assessment. The aquatic communities present within the Steenkoolspruit and the Blesbokspruit systems are considered largely to critically modified from those expected for pristine Highveld Ecoregion streams. Where surface water was present to a larger extent (sites LL2 and LL6), an improvement in aquatic community sensitivity and diversity is observed and thus lack of sufficient flow and flow diversity as well as lack of stream connectivity are deemed the key drivers shaping the aquatic community structure at the time of the assessment. Taxa dependent on flow are likely to be largely absent from these streams under the current low flow conditions. Some impacts in terms of elevated EC, likely related to agricultural return flows and a concentration of salts in the systems at the time of the assessment, as well as impacts related to supersaturation in terms of dissolved oxygen, may limit, to a lesser degree, some of the more sensitive macro-invertebrate species expected in these systems. It is the opinion of the ecologist that results obtained in this aquatic assessment are not an accurate representation of the ecological importance and sensitivity of the systems within the MRAs as a result of the prevailing drought conditions at the time of the assessment. Despite these limitations however, it is the opinion of the ecologist that these systems are not regarded as extremely sensitive and have already been subjected to various impacts associated with agricultural return flows, livestock grazing and trampling, erosion, sedimentation and incision.

Chapter I: Sensitive landscapes (Wetlands)

Information on wetlands as contained under this section has been obtained from:

- The report titled: "*Aquatic and wetland assessment as part of the environmental assessment and authorisation process for the Leslie 2 underground coal mining operation, Gauteng Province*", dated November 2016 and compiled by Scientific Aquatic Services (Annexure H4)

1 Freshwater resource system characterisation

In preparation for the field survey, aerial photographs, digital satellite imagery and provincial and national wetland databases were used to identify areas of interest on a desktop level (refer to Section A in Annexure H4). Thereafter, the identified points of interest and any additional freshwater resources noted during the field survey were also assessed. It should be noted that the numerous artificial farm dams occurring throughout the MRA, were not assessed since these are considered to be man-made structures which do not contribute significantly to provincial wetland conservation targets, nor to the ecological service provision of wetlands within the project site.

During the site visit undertaken in October 2016, two primary freshwater systems were identified within the project site (Figure 37). Even though the NFEPA database identified the Blesbokspruit river running through the southern section of the project site, following further investigation and the consideration of results obtained during the field assessment, it was concluded that the most appropriate classification of the system, bearing in mind that wetland features occur in a continuum, are channelled valley bottom systems.

Each of the identified systems consisted of numerous different HGM units, which included:

- **Steenkoolspruit system**: Located within the northern portions of the northern section of the MRA[58]. HGM units associated with this system includes hillslope seeps, channelled valley bottom wetlands and a floodplain area; and
- **Blesbokspruit system**: Located within the southern portion of the northern section of the MRA and in the whole of the southern section of the MRA. HGM units associated with this system includes valley bottom wetlands (which varies between channelled and unchannelled), and hillslope seep wetlands.

The figure below illustrates the locality of these resources in relation to the MRA.

[58] Mineral rights application area

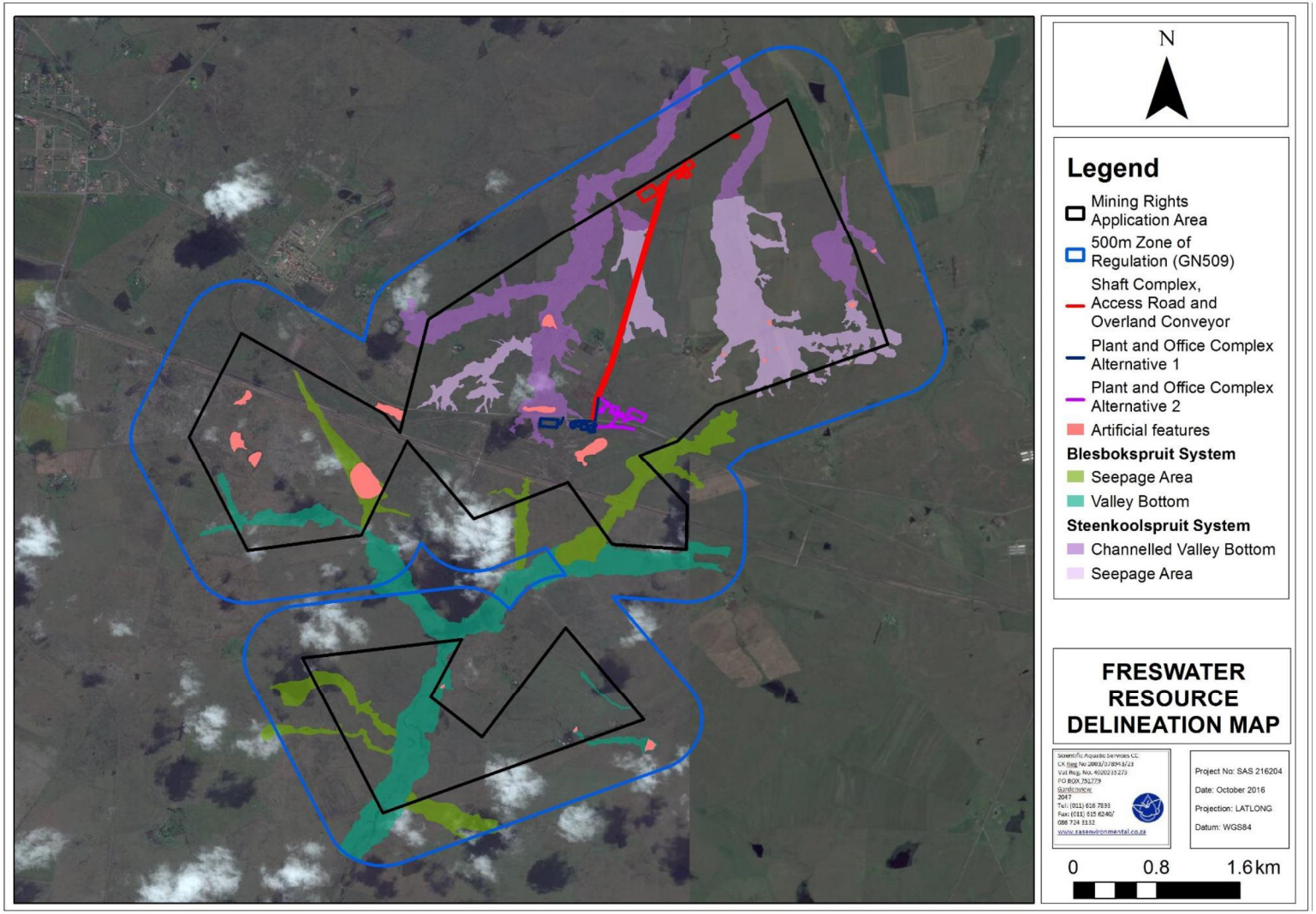

Figure 37: Approximate location of the freshwater resources assessed in relation to the MRA (SAS, 2016)

Following the site visit, various assessments were undertaken in order to determine the following:

- PES, incorporating aspects such as hydrology, vegetation and geomorphology;
- Service provision of the freshwater resources, which incorporates biodiversity maintenance, flood attenuation, streamflow regulation and assimilation, to name a few;
- The EIS is guided by the results obtained from the assessment of PES and service provision of the resources;
- An appropriate REC to guide the management of the resources with the intent of enhancing the ecological integrity of the resources where feasible;
- Assessment of impacts of the construction and operation of the proposed mining activities on the resources; and
- Presentation of mitigatory measures to minimise impacts of the proposed activities on the freshwater resources.

The results of the assessments are presented in the dashboard reports in Annexure H4. Table 41 below provides a summary of the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) for both the Steenkoolspruit and Blesbokspruit systems.

Table 41: Summary of results of the assessment of the Steenkoolspruit and Blesbokspruit systems

System	Feature HGM Units Description and EIS discussion	PES Category	EIS Category	REC Category
Steenkoolspruit system	A continuum of channelled valley bottom wetlands with associated hillslope seep wetlands, located within the northern section of the MRA. Channelled valley bottom: Most of these resources are considered to be CBAs (Gauteng C-Plan, 2014) (Refer to Section A). Considered to be relatively ecologically intact and therefore considered to have a moderate to high ecological importance, as it provides habitat to various biota and delivers intermediate delivery of important ecoservices (e.g. erosion control). Seepage area: Despite the relative ecological integrity of the overall system, low habitat diversity is present, thus limiting the capacity to support wetland biota and therefore biodiversity is considered relatively low. Due to the altered vegetation for agricultural	C	Channelled Valley Bottom: B Seepage area: C	C

System	Feature HGM Units Description and EIS discussion	PES Category	EIS Category	REC Category
	purposes, and therefore, also a reduced capacity for biodiversity support, these HGM units are considered to be moderately ecologically important and sensitive.			
Blesbokspruit system	A continuum of channelled and unchannelled valley bottom wetlands, with connected seepage areas, situated in the southern portion of the northern MRA section and within the southern MRA portion. Valley bottom: The Mpumalanga Highveld Wetlands database (2014) indicated that the (channelled/unchannelled) valley bottom units associated with this system are considered to be FEPA wetlands (refer to Section A), whilst the southern section of these resources are considered to be a CBA (Gauteng C-Plan, 2014). These resources are deemed to have high ecological importance and sensitivity as it provides habitat to rare and endangered species and provides migration route to wetland species. Hillslope seep: Ecologically important and sensitive at a provincial scale, but is not considered to provide migration route or serve as breeding and feeding sites to wetland species.	C	Valley bottom: B Hillslope seepage: C	C

2 Delineation and sensitivity mapping

2.1 Delineation

All freshwater resources within the MRA were delineated in the field according to the method of DWAF (2008). However, use was made of topographic maps and historical and current digital satellite imagery to aid in the delineation. Severe modifications to the hydrology and vegetation of the freshwater resources due to the extensive agricultural activities surrounding these resources, are considered highly likely to have resulted in the alteration of the freshwater resource boundaries over an extended period of time. Due to the ongoing drought conditions and the lack of early spring rainfall, the vegetation as an indicator of the freshwater resource boundary, was limited. However, in certain areas, it was proven to be a reliant indicator, as remnant dry wetland species could be used as indicators of resource boundaries. Therefore, the freshwater resource delineations as presented in this report are regarded

as a best estimate of the temporary zone boundaries based on the site conditions present at the time. Freshwater resources located outside of, but within 500m of the MRA, were delineated using digital satellite imagery, but were not ground-truthed.

During the assessment, the following indicators were used to ascertain the boundaries of the temporary zones of the wetland and riparian resources:

- Terrain units were used as the primary indicator since the freshwater resources are highly ephemeral systems, displaying barely discernible differences between terrestrial and wetland ecosystems. Thus, clear and easily discernible landscape units were present, except where crop field encroached upon the wetlands, which limited the accuracy of this indicator;
- The vegetation indicator was used, where possible, in the identification of the freshwater resource boundaries through the identification of the distribution of facultative and obligate wetland vegetation. However, the use of this parameter was limited due to the belated growing season and the change in vegetation communities between terrestrial and wetland ecosystems was very subtle. Additionally, some vegetation species could not be identified, as many of these species were still dormant, or alternatively have come to the end of the flowering period; and
- Soil form was considered; however, the soils within the MRA do not show soil variations such as gleying (leaching out of iron) and the presence of mottles (soils with variegated colour patterns). Therefore, this indicator was not used extensively to determine boundaries as differences between terrestrial and wetland soils could not be reliably discerned using soil morphology.

2.2 Legislative requirements

Legislative requirements were taken into consideration when determining a suitable buffer zone for the freshwater resources. The definition and motivation for a regulated zone of activity as well as buffer zone for the protection of the freshwater resources can be summarized as follows:

- Activity 12 (xii) (c) of GN 983 of the Environmental Impact Assessment (EIA) Regulations (2014), of the NEMA, 1998 (Act 107 of 1998) must be considered in defining the relevant regulated zone associated with any watercourse (including wetlands as well as rivers). This Listed Activity states that any development exceeding 100 m^2 within a watercourse, in front of a development setback or, if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such development occurs within an urban area, will require an Environmental Authorisation (EA) in terms of the NEMA, 1008 (Act 107 of 1998);
- In terms of the NEMA, the definition of an “urban area” means “areas situated within the urban edge (as defined or adopted by the competent authority), or in instances where no urban edge or boundary has been defined or adopted, it refers to areas situated within the edge of built-up areas.”
- In accordance with GN509 of 2016, a regulated area of a watercourse for section 21c and 21i of the NWA, 1998 is defined as:
- The outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;

- In the absence of a determined 1 in 100 year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or
- A 500 m radius from the delineated boundary (extent) of any wetland or pan.
- In terms of Regulation GN704 of the NWA, 1998, a 100m zone of regulation around the freshwater resources is required. If any mining activities are to take place within 100 meters or the 1:100 year flood lines exemption in terms of this regulation, as well as General Notice no. 1199 of 2009 as it relates to the NWA will also apply and therefore a Water Use License will be required; and
- A conservation buffer zone is assigned to the freshwater resources, in order to assist with the protection of the system during all phases of the proposed mining activities, as deemed necessary by the specialist and in consideration of the Water Research Commission's (WRC) Preliminary Guideline for the Determination of Buffer Zones for
- Rivers, Wetlands and Estuaries (MacFarlane et al., 2015) in collaboration with the DWS (2014).
- All freshwater resources were prescribed a 100m Zone of regulation (GN704) and a 32 m regulated zone, as stipulated by the National Environmental Management Act, 1998 (Act 107 of 1998). Freshwater resources with its associated zones of regulation, in terms of the NWA are depicted in figures 17 and 18 in Section A. In order to ascertain whether this may be considered a reasonable buffer for these features, The Water Research Commission's (WRC) Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries (MacFarlane et al., 2015) was also applied.
- This calculated a buffer of 28m during the construction and operational phases of the proposed development for the valley bottom wetlands (channelled and unchannelled) of the Blesbokspruit and Steenkoolspruit systems. It was also determined that a 15m construction phase and a 24m operational phase buffer be applied to the seepage areas of the Blesbokspruit and the Steenkoolspruit systems. These buffer zones are conceptually depicted in Figure 38. These buffer zones are deemed sufficient to maintain the Present Ecological State, limit any further impact that the proposed mining activities could have on the freshwater resources and ultimately support the Recommended Ecological Category (REC), as well as contributing to local and regional wetland resource conservation initiatives. Even though buffer zones are considered to be important to provide protection of basic ecosystem processes (in this case, the protection of freshwater ecological services), reduce impacts on freshwater resources arising from surrounding activities (e.g. by removing or filtering sediment and pollutants), provision of habitat for aquatic and wetland species as well as for certain terrestrial species, and a range of ancillary societal benefits (Macfarlane et. al, 2015), it should be noted that buffer zones are not considered to be effective mitigation against impacts such as water quality and quantity degradation (due to the cone of depression and possible decant of water into the groundwater supply), hydrological changes arising from stream flow reduction, impoundments or abstraction, nor are they considered to be effective in the management of point-source discharges or contamination of groundwater, both of which require site-specific mitigation measures (Macfarlane et. al, 2015).

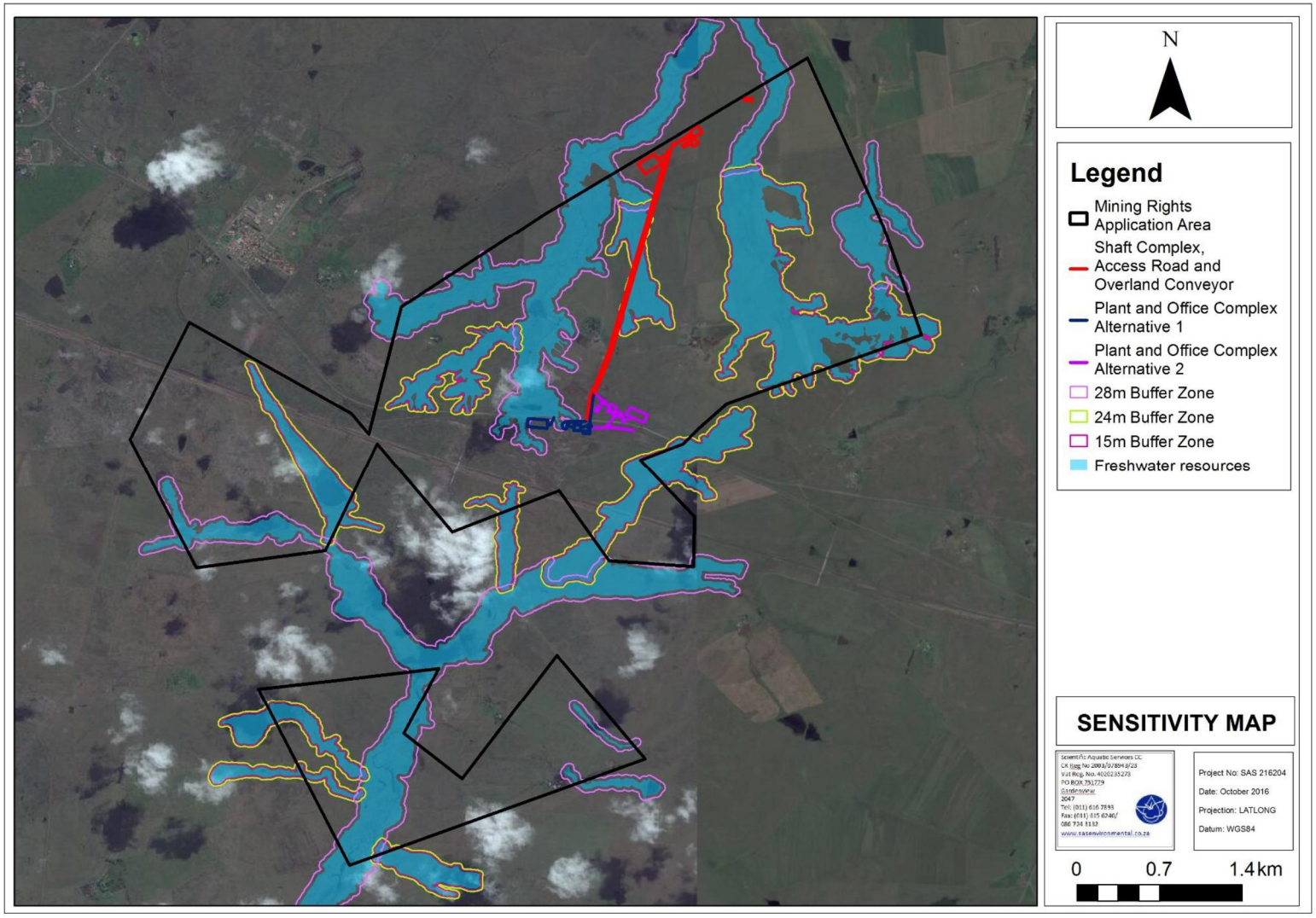

Figure 38: Conceptual presentation of the freshwater resources within the MRA, with their buffer zones