7. Period for which environmental authorisation is required

As per the production rate, life of mine and annual tons provided in Part 4.2.3 and 4.2.4 above, the reclamation activities will be undertaken over a period of 30 years. Therefore the period for which environmental authorisation is required will be for at least 32 years (including 2 years for construction) (excluding decomissioning activities).

8. Description of the process followed to reach the proposed preferred site.

8.1 Details of all alternatives considered

8.1.1 Proposed activity

The proposed activity is that of supplying coal to the Khanyisa IPP by means of the reclamation of two existing co-disposal facilities, as well as the construction and operation of a DHRP and associated infrastructure (e.g. discard disposal facility, comveyors, roads, etc.)

8.1.2 Activity alternatives

8.1.2.1 Mining method

Three alternatives in terms of re-mining method have been identified. These include:

- **Alternative MM1**: Mechanical Load & Haul with mobile equipment
- **Alternative MM2**: A combination of mechanical Load & Haul and hydraulic re-mining
- **Alternative MM3**: Truckless re-mining and transport method

8.1.3 Scheduling alternatives

Two alternatives in terms of scheduling related to the Klippan Co-disposal Facility reclamation, have been identified and include the following:

- **Alternative SC_KP_1**: Mining the entire dump in 2 Phases.
- **Alternative SC_KP_2**: Re-claiming the entire dump right from the start in layers of 3m (or less) at a time, including fines and coarse material as the dump is mined away

Two alternatives in terms of scheduling related to the Blaauwkrans Co-disposal Facility reclamation, have been identified and include the following:

- **Alternative SC_BK_1:** Re-claiming the entire dump right from the start in layers of 3m (or less) at a time, including fines and coarse material as the dump is mined away

- **Alternative SC_BK_1**: Re-claiming the dump in layers of 3m (or less) at a time, including fines and coarse material as the dump is mined away but leaving the yellow boy area in tact

8.1.4 Design / layout alternatives

Two alternatives in terms of design of the tip points have been identified and include the following:

- **Alternative DL1:** Design the DHRP with a single tip point
- **Alternative DL2:** Design the DHRP with 2 tip points, (back tip for Kkhwezela Bokgoni coarse and Klippan coarse and side tip for Blaauwkrans coarse & fines and Klippan fines)

8.1.5 Construction (borrow) material sourcing alternatives

Four alternatives in terms of the sourcing of material for construction purposes have been identified and include the following:

- **Alternative MS1:** Sourcing from DHRP and discard disposal site
- **Alternative MS2:** Sourcing from area to the east of the Return Water Dams
- **Alternative MS3:** Sourcing from combination of S1 and S2 aboove
- **Alternative MS4:** Sourcing from external site(s)

8.1.6 Routing alternatives

Three alternatives for the overland coal conveyor and associated road have been identified and include the following:

- **Alternative CR1 (Option 1):** Conveyor crosses provincial road in the direction of the Khwezela Bokgoni product conveyor. The conveyor then runs along the product conveyor (same route as the ACWA ash conveyor). At the top it crosses the Khwezela Bokgoni product conveyor and ties into ACWA transfer station.
- **Alternative CR2 (Option 2):** The conveyor follows a more direct (straight-line route to the transfer station). The conveyor is curved and does not have any intermediate transfer points.
- **Alternative CR3 (Option 3):** Conveyor runs on the western side of the provincial road to the north of Klippan Co-disposal Facility. It then crosses over/under the provincial road to tie-in to the ACWA transfer station.

Refer also to Table 53 of this Scoping Report for more detail on the advantages and disadvantages identified for each alternative. The preliminary identified alternatives (and other alternatives identified during the process) will be further investigated and assessed during the EIA Phase.

8.1.7 No-go option

If the project does not realise, the *status quo* environmental conditions of the application site will mostly remain as is.

Physical and biophysical environment – The proposed project is expected to create a number of environmental impacts of which include potential impacts on water resources, wetlands, and air quality, including potential comulative impacts (when considering the existing and proposed Khwezela mining and related activities). The reclamation of the co-disposal facilities may further enhance post mining land use in comparison to the current approved post mining rehabiltiation strategies. Some positive long-term impacts may also arise from the project (e.g. groundwater related impacts and air quality related impacts.

Social – A number of social impacts have been provisionally identifed and include impacts on: sense of place. Furthermore, a number of social related impacts have been identified as part of the Social Impact Assessment conducted for the *Khanyisa IPP (power plant) Project*. Since the Khanyisa IPP Coal Supply Project is a supplementary project to the Khanyisa IPP (power plant) Project, cumulative and / or indirect impacts may occur as a result of the overall Project (taking all project scopes into account). Refer to Table 48 for the provisionally identified impacts. It is however also important to note that the co-disposal facilities and Kwhezela Colliery Sctions that are associated with the Coal Supply project, are existing mining and related operations. Therefore the significance of negative social impacts that have been identified could be described as being low in this regard, as regular visitors to the area and the local community are likely to be desensitised to the *mining* operations.

Economic – Should the Environmental Authorisation not be granted, job security and the sustaining of livelihoods in the area may be lost. Skills development may cease and the co-disposal facilities will remain *in situ*. Further to this, the purpose of the project is for coal to be supplied to the Khanyisa IPP. This will not realise should the authorisation not be granted.

Refer to the Alternatives Assessment Report in Annexure D for a description and comparison between the land use alternatives identified.

8.2 Details of the Public Participation Process Followed

A detailed public participation process is undertaken as part of the initial application and Scoping processes. As required by the NEMA, EIA Regulations, 2014 (as amended), the following is conducted as part of the Environmental Authorisation application (proof hereof will be included in the final Public Participation Report that will be attached as Annexure E to this report):

- Advertisement.
  - A newspaper advertisement was placed in three local newspaper..
- Site notices.
  - Site notices were placed around the project site, Clewer and Emalahleni areas.
- Written notices.

- Written notices (including BIDs) were distributed to I&APs and Stakeholders.

- Availability of Scoping Report for public review
  - This Scoping Report is made available for public and stakeholder review from 26 April 2017 to 28 May 2017.

8.3 Summary of issues raised by I&APs

Table 10: Summary of the issues raised by the I&APs

This table will be completed once the public review period has ended.

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					
Landowner/s	Mark with an **X** where consulted				

8.4 The Environmental attributes associated with the sites. A baseline environment.

8.4.1 Type of environment affected by the proposed activity

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

- Chapter A: Geology.
- Chapter B: Climate.
- Chapter C: Topography
- Chapter D: Soil
- Chapter E: Vegetation
- Chapter F: Fauna
- Chapter G: Surface water
- Chapter H: Wetlands and other surface water features
- Chapter I: Groundwater
- Chapter J: Air Quality.
- Chapter K: Noise and vibration
- Chapter L: Visual
- Chapter M: Protected areas and conservation planning
- Chapter N: Sites of archaeological and cultural importance
- Chapter O: Regional socio-economic structures

Note: Information contained in this section of this Scoping Report has thus been sourced from documents (i.e. specialist studies and monitoring reports) compiled for the Khwezela Colliery (previously Landau and Kleinkopje Sections) and Greenside Colliery, where applicable. The majority of the proposed project infrastrcture will be located within the Khwezela Bokgoni (Kleinkopje Colliery) boundary area, with a number of activites also to be undertaken within the Khwezela North (Landau Colliery) and Greenside Colliery boundary areas. Therefore, the information (sources) used for this section of this Scoping Report is considered applicable to the proposed project. Further to this, the reclamation of the two existing co-disposal facilities will also take place at the current location of the two facilities, and thus, the current nature of the environment associated therewith, has also been taken into account in describing the baseline environment. Refer also to Section 9.3 of this report for specialist studies that will be conducted in the EIA Phase of the project.

Chapter A: Geology

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

- The report titled: "*Geohydrological Assessment and Gap Analysis for Kleinkopje Colliery*", dated November 2011 and compiled by Groundwater Complete;
- The report titled: "*Anglo American – Kleinkopje Colliery; Integrated Waste Water Management Plan*", dated April 2015 with report no.: KK/IWULA/02/2154 (here after referred to as the IWWMP, dated April 2015); and
- Landau Colliery – revised EMPr, dated April 2010 and compiled by Clean Stream Environmental Consultants.

A regional geological map of the study area is provided in Figure 18 below.

1. Klippan co-disposal facility and project development area

Khwezela Bokgoni (and thus Klippan Co-disposal Facility) is underlain by rocks of the Karoo Supergroup. The Karoo Supergroup comprises a sedimentary succession of sandstones, siltstones, shales and coal measures. The coal measures are contained within the Vryheid Formation from the Middle Ecca Group. In the Khwezela Bokgoni, area the economically extractable coal is contained mainly within the number 1 and 2 seams. The Karoo sediments are underlain by the Dwyka formation, comprising of diamictites and tillites that form the basement of the Karoo Supergroup.

The Ogies dyke is the only significant geological structure in the Khwezela Bokgoni area and it separates Block 4E and Block 5W. Some minor dolerite dykes, sills and normal faulting have been recorded in the Khwezela Bokgoni area but these do not have a measurable influence on groundwater flow and mass transport. A regional pre-Karoo paleao valley with a northwest-southeast trend is developed in the Landau lll / Block 2A area.

2. Blaauwkrans co-disposal facility and surrounds

The area associated with the location of the Blaauwkrans Co-disposal Facility, is associated with the Vryheid formation of the Ecca Group which overlies a thin layer of Dwyka Group shales and tllites. The Ecca and Dwyka sedimentary rocks were deposited in glacial valleys unconformably overlying Waterberg Group quartzites and sandstones.

A thin veneer of Dwyka sedimentary rocks are present, but they are generally not thick enough to prevent the propagation of the irregular pre-Karoo topography into the overlying Vryheid Formation. The Vryheid Formation attains a maximum thickness of 140m. Up to six coal seams are present, of which four have economic potential. The preservation of the coal seams is a function of pre-Karoo topography, sedimentary processes and present-day erosion. Rare diabase intrusions in the pre-Karoo Waterberg Group have been regionally mapped, but no regional faulting has been detected. The No 1 seam and No 2 seam have been partially mined by underground methods.

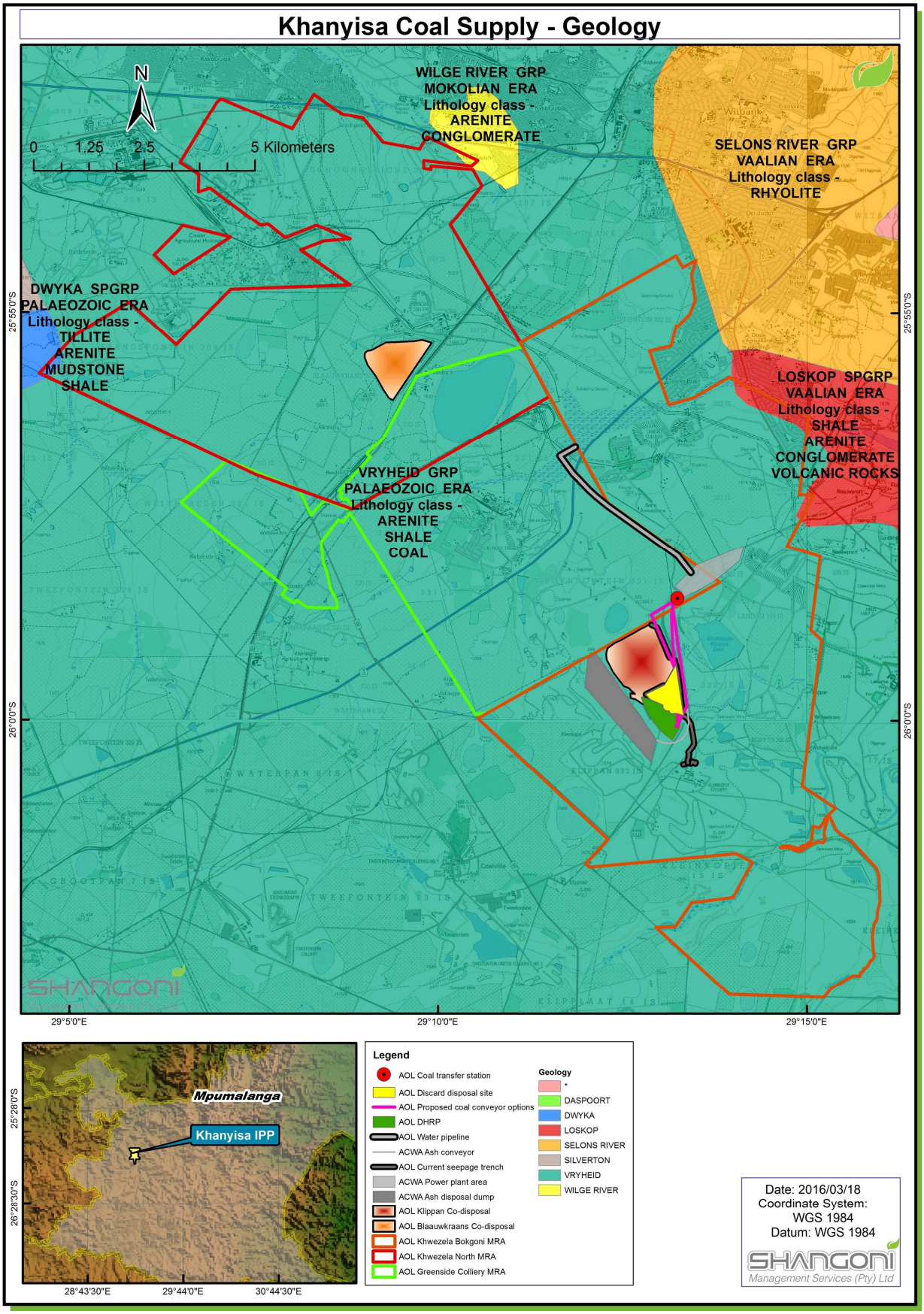

Figure 18: Regional Geology

Chapter B: Climate

The following sources were consulted for the inclusion of the information contained in this section of this report:

- The report titled: "*Anglo American – Kleinkopje Colliery; Integrated Waste Water Management Plan*", dated April 2015 with report no.: KK/IWULA/02/2154 (here after referred to as the IWWMP, dated April 2015);
- The report titled: "*Anglo Operations (Pty) Ltd., Kleinkopje Colliery: Pit 2A Extension. Storm Water Management Plan and Water Balance*; dated September 2016[72];
- World Weather Online (www.worldweatheronline.com);
- AGIS (www.agis.agric.za/agismap);
- Climate-Data.Org (http://en.climate-data.org); and
- Wind data (www.windfinder.com/windstatistics).

The climate within the area associated with Khanyisa IPP Coal Supply Project location is typically "Highveld", with warm summers (12 to 29 degrees Celsius (ºC) range) and cold winters (- 3 to 20 ºC range). Frost is usually experienced between May and August. Prevailing winds are northwest and southeast with an average speed of 5.4 km/hour.

1 Temperature

The closest officially recognised weather stations at which these data are recorded are Carolina and Bethal. Whilst these measurements are not believed to be representative of the Emalahleni area, and are therefore not included in this report, they can be made available on request. Data from the Kleinkopje weather station from 1976 to 1986 are included in Table 11 below. Figure 19 below provides the average maximum and minimum temperatures for Emalahleni.

Table 11: Mean monthly maximum and minimum temperatures from the Kleinkopje weather station (1976 to 1986)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Max.	25	26	27	27	27	26	24	22	18	18	21	24
Min.	11	13	14	15	15	11	8	4	3	2	4	7

[72] Available upon request. Note that a project-specific storm water management plan will be developed during the EIA Phase (taking the surrounding catchments and measures into account).

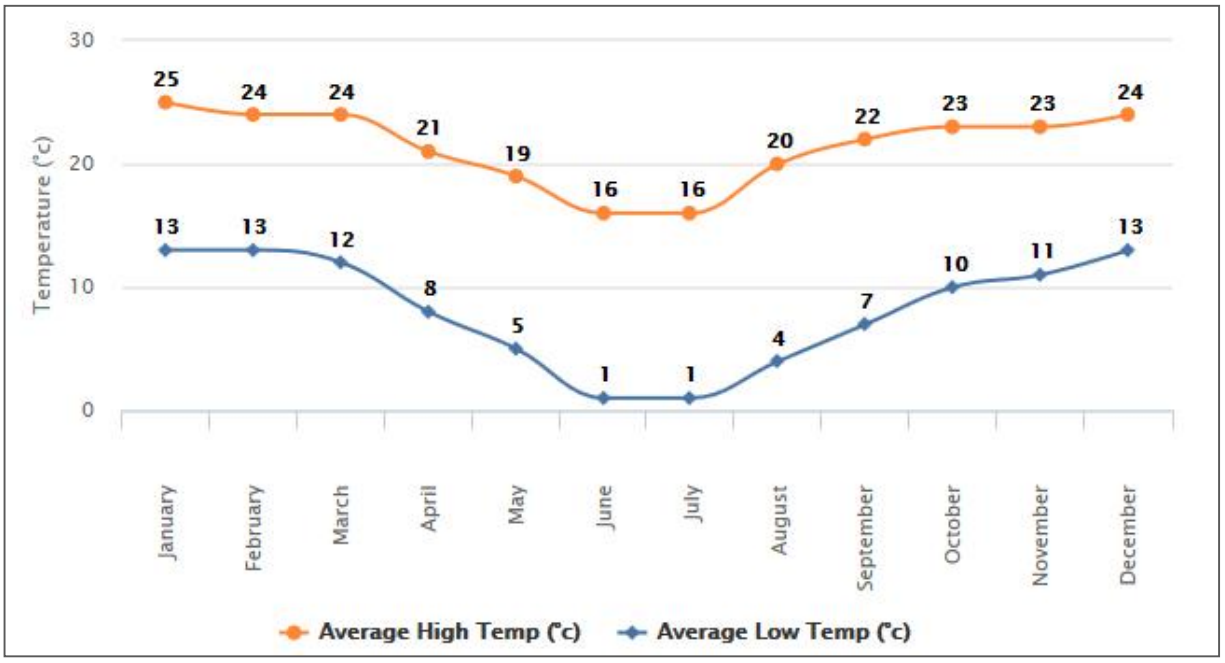

Figure 19: Average high and low temperatures for Emalahleni (source: www.worldweatheronline.com)

2 Rainfall

Rainfall has been recorded on a daily basis for the Emalahleni area. The rain falls predominantly between October and March. The average precipitation per annum is 702.7 according to the rainfall data from the DWS hydrological datasets collected at station B1E001. Most of the rainfall occurs during the summer months with the majority of rain events between October and April. The region receives the highest rainfall in January and the lowest in July.

Table 12: Average annual precipitation and evaporation

Date	Rainfall (mm)	Evaporation (mm)
January	131.5	164.5
February	91.8	138.4
March	73.8	129.6
April	39.3	97.4
May	13.4	79.8
June	7.0	65.3
July	2.9	72.5
August	7.9	98.8
September	20.7	137.3
October	78.3	163.7
November	123.8	158.5
December	116.7	163.6
Annual	**702.7**	**1476.2**

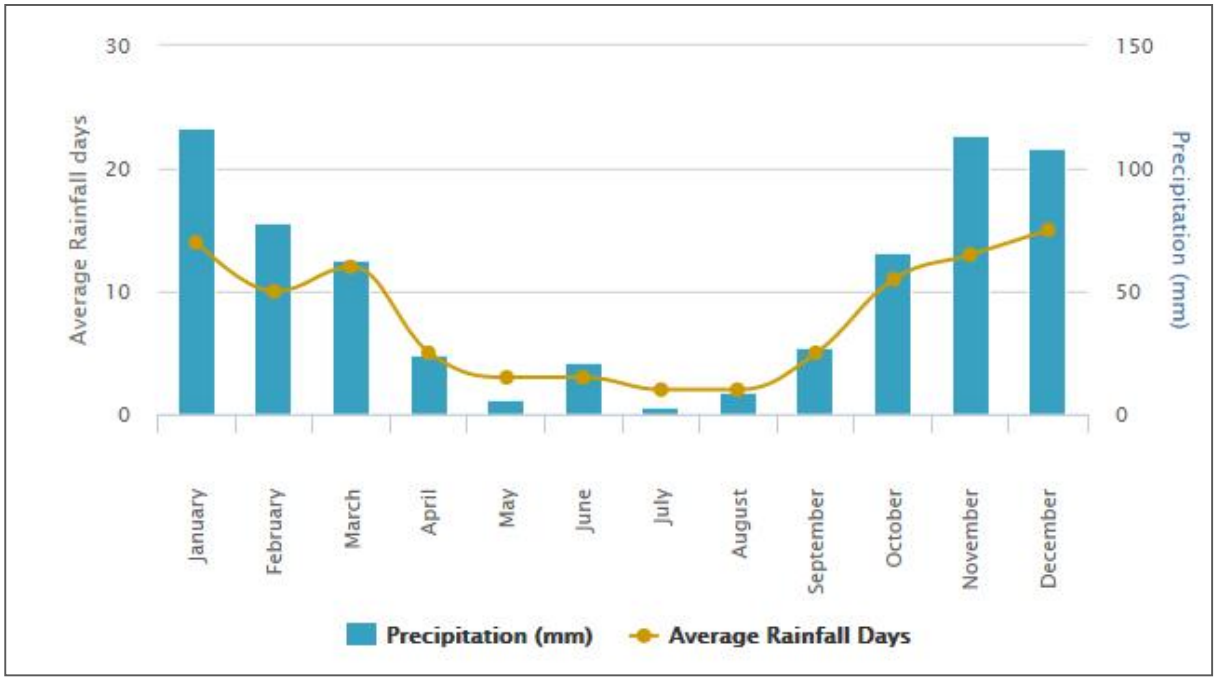

Figure 20: Average rainfall for Emalahleni (source: www.worldweatheronline.com)

3 Extreme weather conditions

Gusting winds are normally experienced during August and September months. Hailstorms are experienced occasionally at the start of the wet season between October and December. Frost is normally experienced in the winter months between May and August.

4 Evaporation

The mean monthly evaporation data from a Symons tank at the Ogies weather station for the period 1910 to 1989 and adjusted A-pan data are shown in Table 13.

Table 13: Mean monthly evaporation (mm) for Ogies weather station, based on the A-pan evaporation data (1910 – 1998)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Tot.
Symons	173	163	179	176	147	145	111	94	76	83	110	143	1600
Adjusted for A-pan	228	209	225	221	183	181	139	122	101	112	149	193	2096
A-pan adjusted for Open Water	141	132	142	150	124	130	95	81	67	65	86	113	1326
A-pan adjusted for Rehabilitated areas –	160	167	180	177	146	145	97	73	51	56	75	115	1442

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Tot.
Grassland													

5 Wind direction and speed

The closest officially recognised weather stations at which these data are recorded are Carolina and Bethal. Data from the Kleinkopje weather station from 1976 to 1986 are included in Table 14.

Table 14: Mean monthly minimum and maximum wind direction and speed from Kleinkopje weather Station (1976 – 1986)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Wind direction	NW	NW	NW	NE	NE	NE	NE	NW	NW	NW	NW	NW
Speed (m/sec)	8.5	9.11	8.16	7.82	7.40	7.98	5.30	5.17	4.82	5.30	6.59	8.32

The prevailing wind direction throughout the year is from the northwest, although it has been noted that storm winds (high velocity winds) generally blow from the southeast, with the strongest winds occurring in later winter and early spring.

Chapter C: Topography

1. Klippan co-disposal facility and project development area

The development area is situated on gently undulating terrain including some low hills and pan depressions. Elevations range from 1498 to 1590 meters above mean sea level (mamsl). Figure 21 below illustrates the topography of the area. The Kkwezela Bokgoni area drains towards the Olifants River, which discharges into the Witbank Dam before draining to the Loskop Dam. Impacts on topography would have occurred in the area in the past due to the mining and related activities.

2. Blaauwkrans co-disposal facility and surrounds

The surface area surrounding the Blaauwkrans Co-disposal Facility is gently undulating. The natural topography has been altered to some extent by the existing infrastructure within and around the Khwezela North mine boundary area, most notably the Navigation Plant and the Blaauwkrans Co-disposal facility itself.

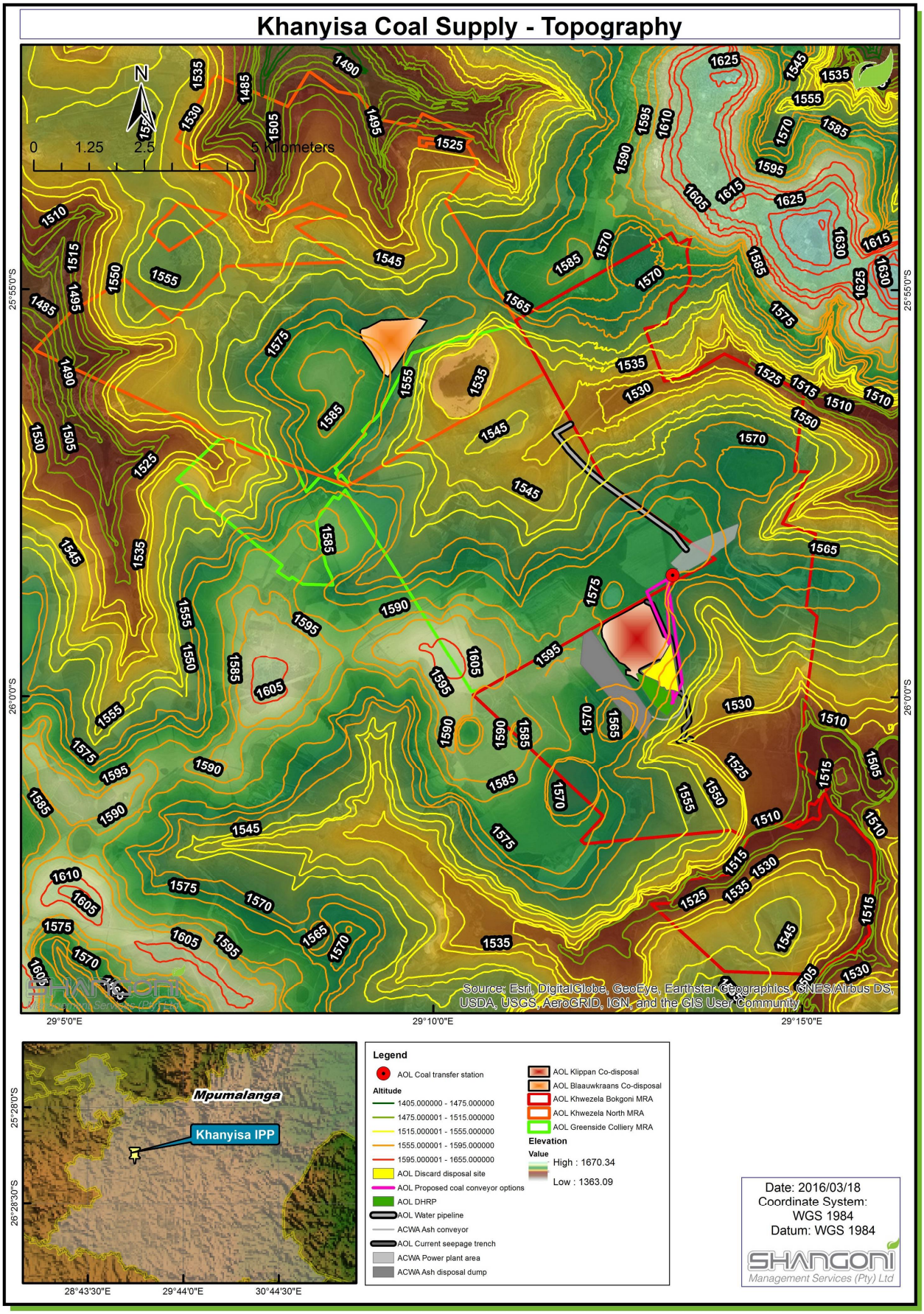

Figure 21: Topography map

Chapter D: Soil

Information contained in this section has been sourced from the following:

- The report titled: "*Soil, land use and land capability assessment for the proposed Kleinkopje Pit 2A Expansion and development of a new pollution control dam, near Emalahleni in the Mpumalanga Province*", dated September 2016 and compiled by Scientifc Aquatic Services;
- The report titled: ""*Biodiversity Action Plan for Kleinkopje Colliery*", dated February 2014, compiled by Digby Wells;
- The report titled: "*Khanyisa Power Station and Power Line Routing, Environmental Assessment Programme – Specialist Soils and Land Capability Studies*", dated September 2011 and compiled by Earth Science Solutions;
- Greenside Colliery EMPr Alignment, 2014;
- Kleinkopje Colliery EMPr, 2012; and
- Landau Colliery EMPr, 2010.

1. Klippan co-disposal facility and project development area

The soils associated with the location of the project development area (to be located to the south and east of the Klippan Co-disposal Facility as well as some infrastructure to be located to the north-east (within the Greenside mining rights area) are classified as freely drained, structureless soils that may have restticted soil depth, excessive drainage, high erodibility and low natural fertility (soil code S2) (refer to Figure 22 below). Figure 23 provides the soil types map sourced from the Greenside Colliery EMPr Alignment, 2014, which corresponds with the general soil map provided in Figure 22.

As per the "*Biodiversity Action Plan for Kleinkopje Colliery*", dated February 2014, compiled by Digby Wells, as well as the approved EMPr, dated April 2012, the dominant soil form in the vicinity of the Klippan Co-disposal Facility is the Hutton Form. Refer to Figure 24 below.

Refer also to Figure 25 below indicating the pre-mining soil depth.

According to the report titled: "S*oil, land use and land capability assessment for the proposed Kleinkopje Pit 2A Expansion and development of a new pollution control dam, near Emalahleni in the Mpumalanga Province*", dated September 2016 and compiled by Scientifc Aquatic Services, the SOTER soil map indicates that the study area (specific to the Pit 2A Extension area for Khwezela Bokgoni) (but also applicable to a section of the Khanyisa IPP Coal Supply project area – crossing of conveyor and associated infrastructure through wetland area), comprise of strongly weathered acid soils with low base saturation (IUSS, 2014), classified as Haplic Acrisols (ACh) as presented in Figure 26.

As per the report titled: "*Khanyisa Power Station and Power Line Routing, Environmental Assessment Programme – Specialist Soils and Land Capability Studies*", dated September 2011 and compiled by Earth Science Solutions, the dominant soil forms encountered in the area associated with the

Khanyisa IPP (power station) footprint area (and thus also a section of the coal conveyor infrastructure and coal transfer tower), include thee Hutton, Griffin, Clovelly, Avalon, Glencoe and Fernwood Forms. The rehabilitated nature of the ash disposal site (environmental authorisation issued to ACWA Power) renders all of the soils Witbank Forms (Man Made), the depth and consistency of the soil profile being of greater importance to the understanding of the site conditions. These materials are generally moderately shallow (450mm to 600mm), with significant stone and rock inclusions, and an environmentally stable composition for the most part (ESS, 2011).

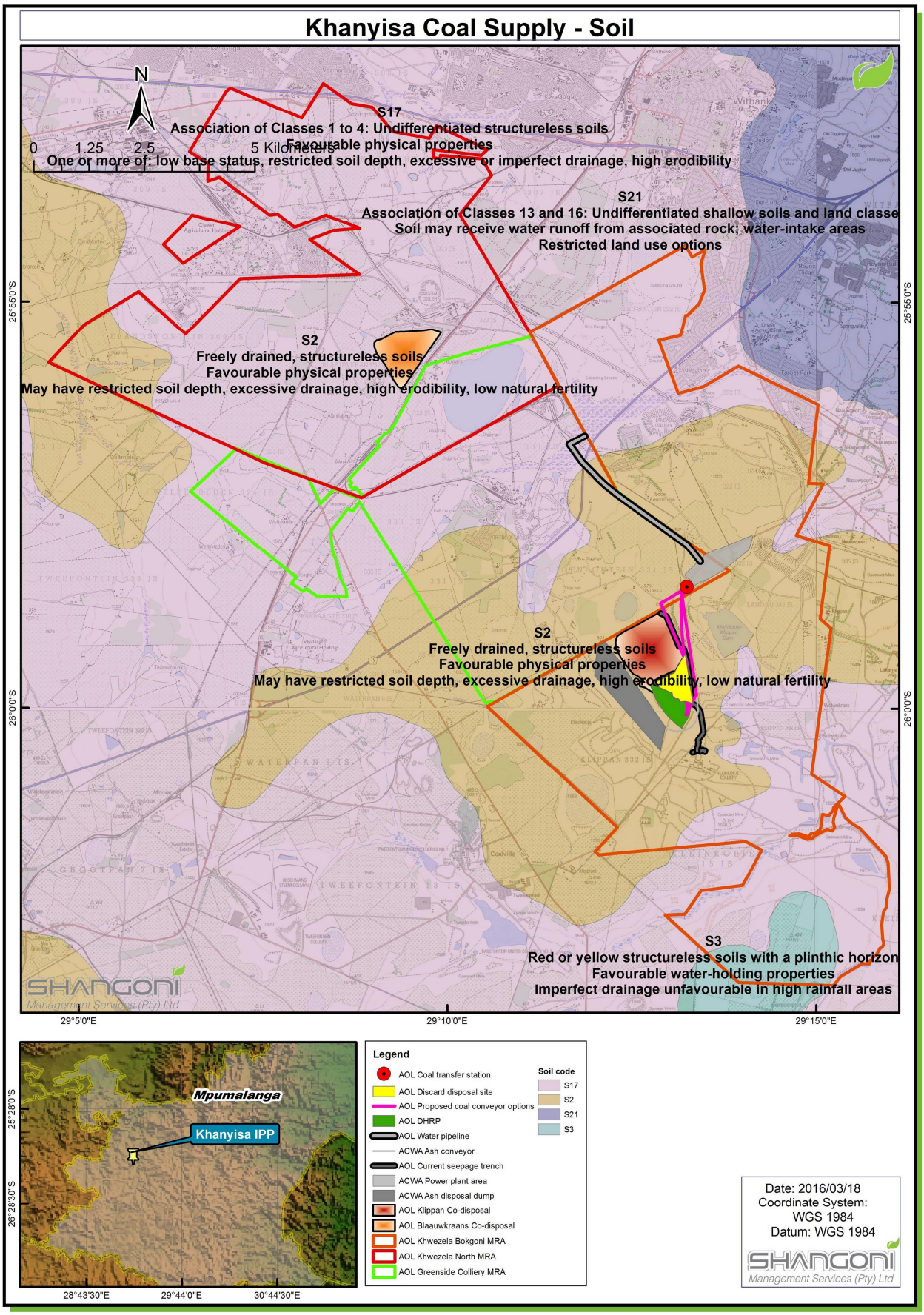

Figure 22: General soil map

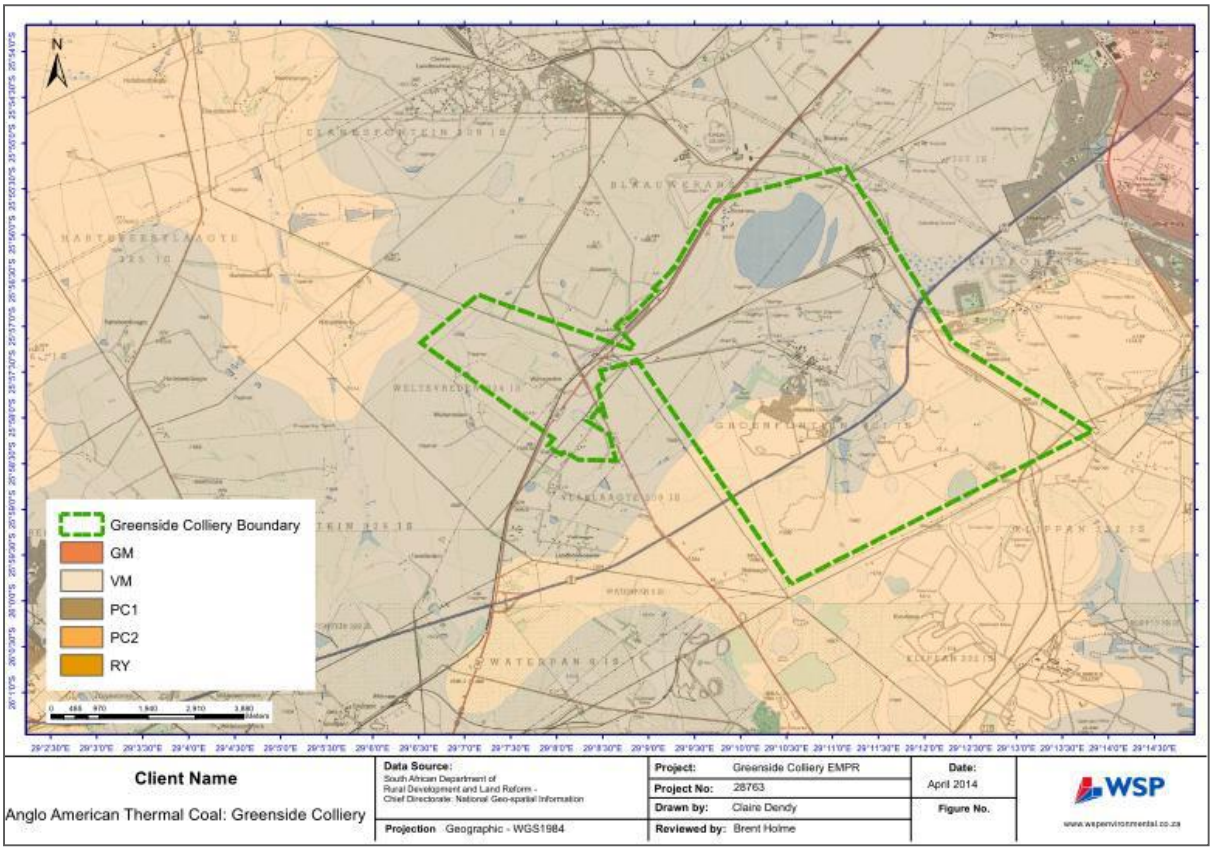

Figure 23: Soil map (sourced from Greenside Colliery EMPr Alignment, 2014)[73]

[73] GM – Glenrosa and/or Mispah forms (other soils may occur), lime rare or absent in the entire landscape; VM – One or more of: vertic, melanic, red structured diagnostic horizons, undifferentiated; PC1 – Plinthic cantena: dystrophic and/or mesotrophic, red soils not widespread, upland duplex and margalitic soils rare; PC2 – Plinthic cantena: dystrophic and/or mesotrophic, red soils widespread, upland duplex and margalitic soils rare; RY – Red-yellow apedal, freely drained soils; red, dystrophic and/or mesotrophic

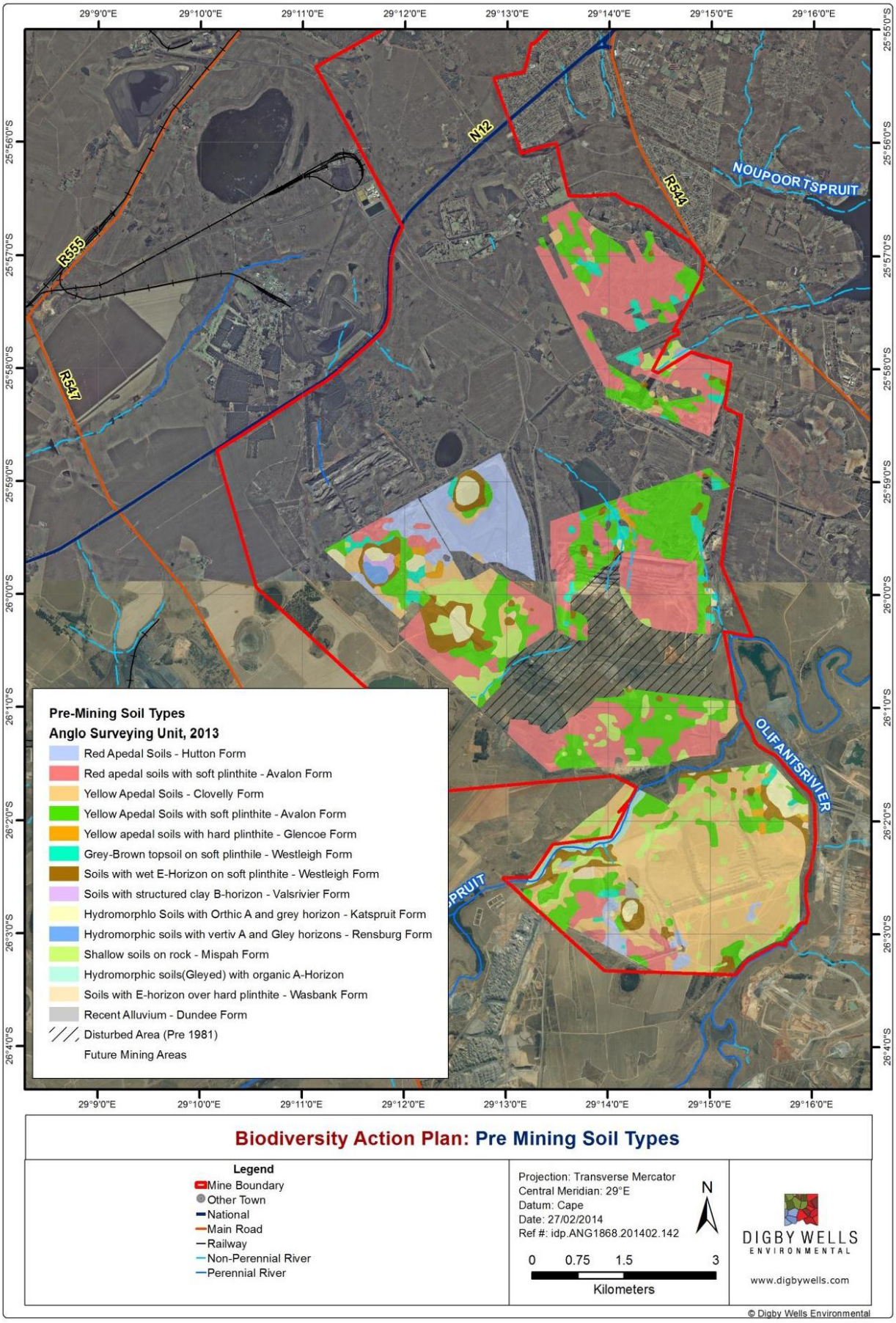

Figure 24: Pre-mining soil types in relation to the location of the Khanyisa IPP Coal Supply development area (Khwezela Bokgoni) (Source: Digby Wells, 2014)

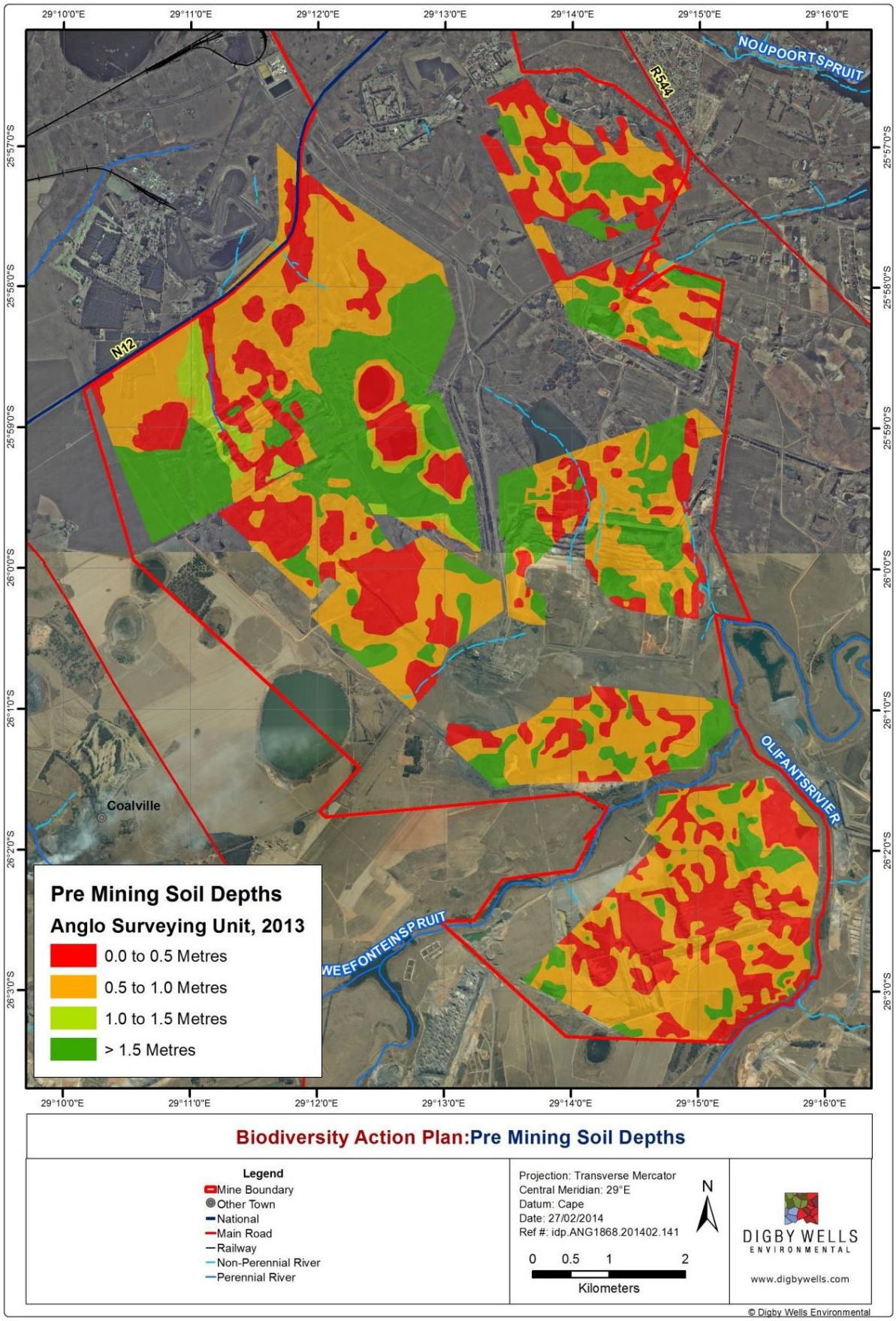

Figure 25: Pre-mining soil depths in relation to the location of the Khanyisa IPP Coal Supply development area (Khwezela: Bokgoni and Greenside Collieries) (Source: Digby Wells, 2014)

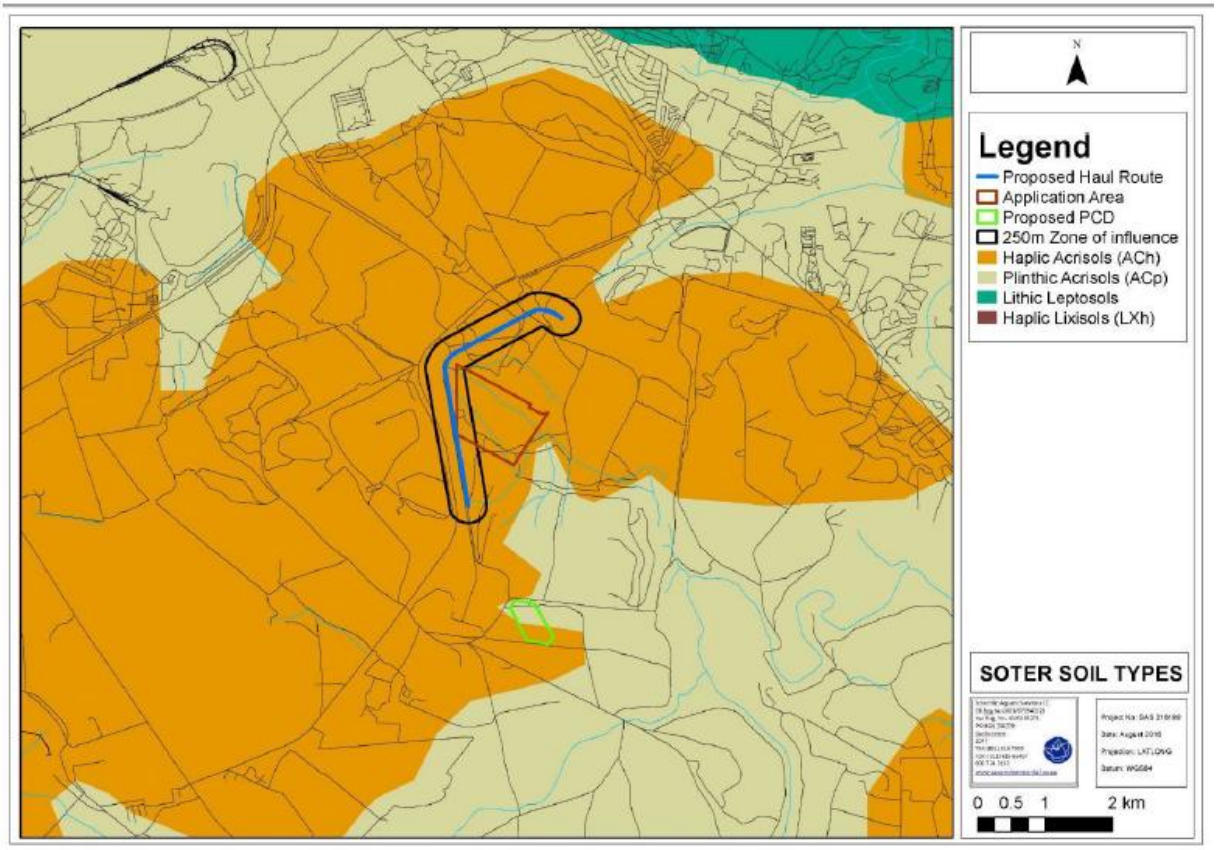

Figure 26: Dominant soil types in the vicinity of the Khanyisa IPP Coal Supply area, according to the SOTER database (Source: SAS, 2016).

2. Blaauwkrans co-disposal facility and surrounds

The soils associated with the location of the Blaauwkrans co-disposal facility and surrounds are classified as undiferentiated structureless soils, with low base status, restricted soil depth, excssive or imperfect drainage, and high erodibility (soil code S217) (refer to Figure 18 above).

As per the Khwezela North (Landau) Colliery approved EMPr, 2010, before the construction of the Blaauwkrans Co-disposal facility commenced, the surface topography was typical of an old land surface, i.e. without steep slopes and with widely spaced natural drainage channels. The soil forms encountered were: Hutton, Clovelly, Avalon and Bainsvlei. Dr. H.v.H. van der Watt and Dr. A.S. Claassens carried out a soil survey of the Blaauwkrans Co-disposal site in November 1991. The results are presented in Supplementary Report No. 3 of the 1999 EMPr. The report is available from the mine upon request.