

# DRAFT ENVIRONMENTAL BASIC ASSESSMENT REPORT #1

PROPOSED DEVELOPMENT OF A PORTION OF PORTION 6  
WATERVAL 303 JQ  
(WESTERN LIMB DISTRIBUTION CENTRE)

RUSTENBURG LOCAL MUNICIPALITY

NORTH WEST PROVINCE

Submitted by:

**ENVIROVISION CONSULTING CC**

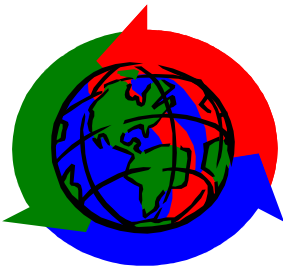
CK 2003/050777/23

**ENVIRONMENTAL SPECIALISTS**

☒ 450 WENDY STREET, WATERKLOOF GLEN, PRETORIA, 0181

E-MAIL ADDRESS: [ENVIROVISION@LANTIC.NET](mailto:ENVIROVISION@LANTIC.NET)

☎ 0824440367 ☎ 0865579447



Submitted to:

1. Mr Livhuwani Kutame  
North West Department of Economic Development, Environment, Conservation & Tourism  
80 Church Street  
RUSTENBURG  
0300

*Departmental Reference:* NWP/EIA/18/2013

2. Interested & Affected Parties

On behalf of:

Anglo American Platinum (Pty) Ltd

Submitted on:

13 August 2013



**the DEDECT**

Department:  
**Economic Development, Environment, Conservation and Tourism**  
North West Provincial Government  
**Republic of South Africa**

Agricentre Building  
Cnr. Dr. James Moroka &  
Stadium Road  
Private Bag X2039,  
Mmabatho, 2735

**DIRECTORATE: ENVIRONMENTAL QUALITY  
& PROTECTION**

Tel: (018) 389 5959/  
5156  
Fax: (018) 389 5006

(For official use only)

**File Reference Number:**  
**Application Number:**  
**Date Received:**


Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

**Kindly note that:**

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

## SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES	NO
	√

If YES, please complete the form titled "Details of specialist and declaration of interest" for appointment of a specialist for each specialist thus appointed:

Any specialist reports must be contained in Appendix D.

---

### 1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail<sup>1</sup>:

The proposed development of a portion of Portion 6 Waterval 303 JQ, Rustenburg Local Municipality, North West Province for purposes of establishing warehousing, distribution and supply chain facilities, hazardous goods storage facilities as well as related railway infrastructure on a total development footprint of approximately 8 hectares.

### 2. FEASIBLE AND REASONABLE ALTERNATIVES

**"alternatives"**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

---

<sup>1</sup> Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

### Background to the description of alternatives

According to DEAT 2004, "The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and or through avoiding potentially significant negative impacts".

The above description emphasises the importance of impact significance in the identification of alternatives in that it should *inter alia* be aimed at avoiding potentially significant negative impacts.

DEAT 2004 identifies the following types or categories of alternatives:

- Activity alternatives
- Location alternatives
- Process alternatives
- Demand alternatives
- Scheduling alternatives
- Input alternatives
- Routing alternatives
- Site layout alternatives
- Scale alternatives
- Design alternatives
- "No go" alternatives

### Activity alternatives

*"These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans and programmes as well as projects. Consideration of such alternatives requires a change in the nature of the proposed activity. An example is incineration of waste rather than disposal in a landfill, or the provision of public transport rather than increasing the capacity of roads. In view of the substantive differences in the nature of the proposed activities, it is likely that this category is most appropriate at a strategic decision-making level, such as in a Strategic Environmental Assessment" (DEAT:2004).*

The proposed activity does not take place at a strategic decision-making level. Activity alternatives therefore do not apply.

### Location alternatives

*"Location alternatives could be considered for the entire proposal or for a component of the proposal, for example the location of a processing plant. The latter is sometimes considered under site layout alternatives. A distinction should also be drawn between alternative locations that are geographically quite separate, and alternative locations that are in close proximity. In the case of the latter, alternative locations in the same geographic area are often referred to as alternative sites. This tends to be the more common application" (DEAT: 2004).*

During the pre-planning phase various location alternatives were considered. All of these alternatives were discarded in favour of the proposed development due to the following considerations:

- Ownership has already been secured (Appendix G8);
- No heritage resources have been uncovered during a heritage impact assessment (Appendix G8);
- No objections were received from I&APs during the prescribed public participation process;
- Engineering services can be secured (Appendix D1); and
- It is supported from a geotechnical perspective (Appendix D2).

### Process alternatives

*"This type of alternative is particularly relevant to industrial projects. Due to the technical nature of the alternatives, the proponent is expected to play a major role in the identification of alternatives. For this reason transparency in identification and evaluation of alternatives is crucial"* (DEAT:2004).

Due to the non-industrial nature of the proposed activity, process alternatives do not apply to the proposed development.

### Demand alternatives

*"Demand alternatives arise when a demand for a certain product or service can be met by some alternative means. Thus, for example, the demand for electricity could be met by supplying more energy or through using energy more efficiently by managing demand"* (DEAT:2004).

Energy efficient alternatives may pose feasible and reasonable alternatives that have been incorporated into the relevant project proposal and have thus not been evaluated as separate alternatives.

### Scheduling alternatives

*"These are sometimes known as sequencing or phasing alternatives. In this case an activity may comprise a number of components, which can be scheduled in a different order or at different times and as such produce different impacts. For example, activities that produce noise could be scheduled during the day to minimize impacts, and activities that may impact on birds could be scheduled to avoid the migratory season. Such alternatives could be incorporated into the project proposal and so be part of the project description, and hence need not necessarily be evaluated as separate alternatives"* (DEAT:2004).

Scheduling alternatives may pose feasible and reasonable alternatives that have been incorporated into the relevant project proposal and have thus not been evaluated as separate alternatives.

### Input alternatives

*"By their nature, input alternatives are most applicable to industrial applications that may use different raw materials or energy sources in their processes. For example, an industry may consider using either high sulphur coal or natural gas as a source of fuel. Again, such alternatives could be incorporated into the project proposal and so be part of the project description, and need not necessarily be evaluated as separate alternatives"* (DEAT:2004).

Due to the non-industrial nature of the proposed activity, input alternatives have not been investigated.

### Routing alternatives

*"Consideration of alternative routes generally applies to linear developments such as power lines, transport and pipeline routes. In route investigations, various corridors are investigated and compared in terms of their impacts"* (DEAT:2004).

The proposed activity includes a linear component in the form of proposed railway infrastructure. The proposed railway route represents the only feasible and reasonable route alternative based on legal requirements and design parameters and routing alternatives were thus not considered.

### Site layout alternatives

*"Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. This may include particular components of a proposed development or may include the entire activity. For example, siting of a noisy plant away from residences, and secondly, siting of a particular structure either prominently to attract attention or screened from view to minimise aesthetic impacts"* (DEAT:2004).

The prescribed public participation process as well as the specialist studies that were commissioned did not generate responses or comments necessitating the consideration of any site layout alternatives. No site layout alternatives are therefore proposed.

#### Scale alternatives

*"In some cases, activities that can be broken down into smaller units can be undertaken on different scales. For example, in a housing development there could be the option of 100, 150 or 200 housing units. Each of these scale alternatives may have different impacts"* (DEAT:2004).

The scale of the project proposal has been determined in accordance with perceived needs. Scale alternatives as such were therefore not pursued. It needs to be mentioned that a phased approach to be informed by market indicators may in practice be adopted by the applicant. Such an approach may in turn influence the eventual scale of the proposed development.

#### Design alternatives

*"Consideration of various designs for aesthetic purposes or different construction materials in an attempt to optimise local benefits and sustainability would constitute design alternatives. Appropriate applications of design alternatives are communication towers. In such cases, all designs are assumed to have different impacts. Generally, the design alternatives could be incorporated into the project proposal and so be part of the project description, and need not be evaluated as separate alternatives"* (DEAT: 2004).

The final architectural design will be the result of the consideration of various designs and will enhance the aesthetic character of the area will be embedded in the development's architectural guidelines. No specific design alternatives are thus proposed.

#### "No-go" alternatives

*"The "no-go" alternative ... assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. In a situation where the negative environmental impacts have high significance, the "no-go" alternative takes on particular importance"* (DEAT:2004).

The "no-go" alternative normally receives consideration when a proposed activity is located in an environmentally sensitive area (for example nature reserves or conservation areas), or when a proposed activity poses adverse negative impacts to the environment that cannot be successfully mitigated. The proposed activity is not located in an environmentally sensitive area as described above and also do not pose any potentially negative environmental impacts that cannot be successfully mitigated. The following considerations also enhance its need and desirability:

- Ownership has already been secured (Appendix G8);
- No heritage resources have been uncovered during a heritage impact assessment (Appendix D1);
- No objections were received from I&APs during the prescribed public participation process; and
- It is supported from a geotechnical perspective (Appendix D2).

**Paragraphs 3 – 13 below should be completed for each alternative.**

### **3. ACTIVITY POSITION**

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at

least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

List alternative sites, if applicable.

	Latitude (S):		Longitude (E):	
<b>Alternative:</b> Alternative S1 <sup>2</sup> (preferred or only site alternative)	25°	40'54.33"	27°	21'26.39"
Alternative S2 (if any)	0	'	0	'
Alternative S3 (if any)	0	'	0	'

**In the case of linear activities:**

	Latitude (S):		Longitude (E):	
<b>Alternative:</b> Alternative S1 (preferred or only route alternative)				
• Starting point of the activity	0	'	0	'
• Middle/Additional point of the activity	0	'	0	'
• End point of the activity	0	'	0	'
Alternative S2 (if any)				
• Starting point of the activity	0	'	0	'
• Middle/Additional point of the activity	0	'	0	'
• End point of the activity	0	'	0	'
Alternative S3 (if any)				
• Starting point of the activity	0	'	0	'
• Middle/Additional point of the activity	0	'	0	'
• End point of the activity	0	'	0	'

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

#### 4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

<b>Alternative:</b>	<b>Size of the activity:</b>
Alternative A1 <sup>3</sup> (preferred activity alternative)	± 80 000 m <sup>2</sup>
Alternative A2 (if any)	m <sup>2</sup>
Alternative A3 (if any)	m <sup>2</sup>

<sup>2</sup> "Alternative S.." refer to site alternatives.

<sup>3</sup> "Alternative A.." refer to activity, process, technology or other alternatives.

or, for linear activities:

**Alternative:**

Alternative A1 (preferred activity alternative)  
Alternative A2 (if any)  
Alternative A3 (if any)

**Length of the activity:**

m
m
m

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

**Alternative:**

Alternative A1 (preferred activity alternative)  
Alternative A2 (if any)  
Alternative A3 (if any)

**Size of the site/servitude:**

± 80 000 m <sup>2</sup>
m <sup>2</sup>
m <sup>2</sup>

**5. SITE ACCESS**

Does ready access to the site exist?

YES	NO
√	
m	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Access to the proposed activity will be gained from the existing tar road to the south of the proposed activity site.
---

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

**6. SITE OR ROUTE PLAN**

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;



- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8 metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
  - rivers;
  - the 1:100 year flood line (where available or where it is required by DWA);
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.11 the positions from where photographs of the site were taken.

**7. SITE PHOTOGRAPHS**

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

**8. FACILITY ILLUSTRATION**

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

**9. ACTIVITY MOTIVATION**

**9(a) Socio-economic value of the activity**

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

±R60 million	
±R2 million	
YES √	NO
YES	NO √

How many new employment opportunities will be created in the development phase of the activity?	± 20
What is the expected value of the employment opportunities during the development phase?	±R 250 000
What percentage of this will accrue to previously disadvantaged individuals?	80%
How many permanent new employment opportunities will be created during the operational phase of the activity?	-
What is the expected current value of the employment opportunities during the first 10 years?	-
What percentage of this will accrue to previously disadvantaged individuals?	-

**9(b) Need and desirability of the activity**

Motivate and explain the need and desirability of the activity (including demand for the activity):

<b>NEED:</b>			
1.	Was the relevant provincial planning department involved in the application?	YES	NO √
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES √	NO
3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:		

<b>DESIRABILITY:</b>			
1.	Does the proposed land use / development fit the surrounding area?	YES √	NO
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES √	NO
3.	Will the benefits of the proposed land use / development outweigh the negative impacts of it?	YES √	NO
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		

5.	Will the proposed land use / development impact on the sense of place?	YES	NO√
6.	Will the proposed land use / development set a precedent?	YES	NO√
7.	Will any person's rights be affected by the proposed land use / development?	YES	NO√
8.	Will the proposed land use / development compromise the "urban edge"?	YES	NO√
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		

<b>BENEFITS:</b>			
1.	Will the land use / development have any benefits for society in general?	YES	NO √
2.	Explain:		
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES	NO √
4.	Explain:		

## 10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
Explosives Act (Act No. 26 of 1956, as amended).	Safety & Security	1956
Hazardous Substance Act (Act 15 of 1973).	Minerals & Energy	1973
Health Act (Act 63 of 1977).	Health	1977
Water Services Act (Act 108 of 1997).	Water & Forestry	1997
National Heritage Resources Act (Act 25 of 1999).	Arts & Culture	1999
National Water Act (Act 36 of 1998).	Water & Forestry	1998
Occupational Health and Safety Act (Act 85 of 1993).	Health	1993
National Veld and Forest Fire Act (Act 101 of 1998).	Water & Forestry	1998
Environmental Conservation Act (Act 73 of 1989).	Environment	1989
National Environmental Management Act (Act 107 of 1998).	Environment	1998
Labour Relations Act (Act 66 of 1995).	Labour	1995
Health & Safety Act (Act 29 of 1996).	Health	1996
Minerals Act (Act 50 of 1991).	Minerals & Energy	1991
National Monuments Act (Act 28 of 1969).	Arts & Culture	1969
Town Planning and Towns Ordinance 15 of 1986.	Planning	1986

## 11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### 11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
√	

If yes, what estimated quantity will be produced in one-three weeks/per month?

Uncertain
-----------

How will the construction solid waste be disposed of (describe)?

Any construction waste to be produced will be used as backfill for the foundations of structures or road construction.

Where will the construction solid waste be disposed of (describe)?

On site.

Will the activity produce solid waste during its operational phase?

YES	NO
√	

If yes, what estimated quantity will be produced per month?

± 350 m <sup>3</sup>
----------------------

How will the solid waste be disposed of (describe)?

All solid waste will be collected by applicant at a designated point. The solid waste will then be disposed of at a licenced waste disposal site.

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Not applicable.

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO
	√

**If yes, inform the competent authority and request a change to an application for scoping and EIA.**

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
	√

If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

**11(b) Liquid effluent**

Will the activity produce effluent during construction/operational phase, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO √
-----	---------

If yes, what estimated quantity will be produced in one-three weeks/per month?

m <sup>3</sup> N/A	
-----------------------	--

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO √
-----	---------

If yes, the applicant should consult with the competent authority to determine whether it requires license in terms of National Environmental Management:

Waste Act, (Act No. 59 of 2008)

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO √
-----	---------

If yes, provide the particulars of the facility:

Facility name:

--

Contact person:

--

Postal address:

--

Postal code:

--

Telephone:

--

E-mail:

--

Cell:	
Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

--

**11(c) Emissions into the atmosphere**

Will the activity release emissions into the atmosphere?

YES	NO √
-----	---------

If yes, is it controlled by any legislation of any sphere of government?

YES	NO
-----	----

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

--

**11(d) Generation of noise**

Will the activity generate noise?

YES √	NO
YES √	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

Low level noise that can be associated with delivery and dispatch vehicles can be expected. These noises are being regulated in terms of Municipal by-laws.

**12. WATER USE**

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box (es)

Municipal	water board	Groundwater	river, stream, dam or lake	other √	the activity will not use water
-----------	-------------	-------------	----------------------------	------------	---------------------------------

If water is to be abstracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be abstracted per month:

Does the activity require a water use license from the Department of Water Affairs?

YES	NO √
-----	---------

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

**13. ENERGY EFFICIENCY**

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

- Energy efficient lighting with occupancy sensing in all areas of the buildings;
- Occupancy Sensing for Air Conditioning;
- Centralised power feeds to buildings and increased cable sizes to reduce energy losses;
- Designed in accordance with the guidelines of SANS 204 and SANS 10400XA;
- Heat pumps for hot water generation.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

- Provision is made for the future installation and connection of 100kW of grid connected Photovoltaic electricity generation;
- A standby generator will be installed to supply essential loads and emergency lighting.

**SECTION B: SITE/AREA/PROPERTY DESCRIPTION**

**Important notes:**

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No.(e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section?
 

YES	NO
	√

If YES, please complete the form entitled “Details of specialist and declaration of interest” for each specialist thus appointed:

All specialist reports must be contained in Appendix D.

---

Property description/physical address:

A portion of Portion 6 Waterval 303 JQ, Rustenburg Local Municipality, North West Province.

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

-

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use zoning:

Agriculture.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to , to this application.

Is a change of land-use or a consent use application required?

YES	NO
√	

Must a building plan be submitted to the local authority?

YES	NO
√	

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

## 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

### Alternative S1:

Flat	1:50 – 1:20 √	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	------------------	-------------	-------------	--------------	-------------	------------------

### Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

### Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

## 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

**NB: Indicate by highlighting/ticking**

- 2.1 Ridgeline
- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- 2.5 Open valley
- 2.6 Plain ✓
- 2.7 Undulating plain / low hills
- 2.8 Dune
- 2.9 Seafront
- 2.10 Any other (Specify)



**3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE**  
(KINDLY REFER TO APPENDIX D2: GEOTECHNICAL FOUNDATION INVESTIGATION)

Is the site(s) located on any of the following (tick the appropriate boxes)?

	<b>Alternative S1:</b>		<b>Alternative S2 (if any):</b>		<b>Alternative S3 (if any):</b>	
Shallow water table (less than 1.5m deep)	YES	NO √	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO √	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO √	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO √	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO √	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES √	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO √	YES	NO	YES	NO
An area sensitive to erosion	YES	NO √	YES	NO	YES	NO

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

**4. GROUNDCOVER**

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition <sup>E</sup> √	Natural veld with scattered aliens <sup>E</sup>	Natural veld with heavy infestation <sup>E</sup>	Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

## 5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

**NB: Indicate by highlighting/ticking**

- 5.1 Natural area
- 5.2 Low density residential
- 5.3 Medium density residential ✓
- 5.4 High density residential
- 5.5 Informal residential<sup>A</sup>
- 5.6 Retail commercial & warehousing
- 5.7 Light industrial
- 5.8 Medium industrial<sup>AN</sup>
- 5.9 Heavy industrial<sup>AN</sup>
- 5.10 Power station
- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam<sup>A</sup>
- 5.14 Quarry, sand or borrow pit
- 5.15 Dam or reservoir
- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant<sup>A</sup>
- 5.22 Train station or shunting yard<sup>N</sup>
- 5.23 Railway line<sup>N</sup>
- 5.24 Major road (4 lanes or more)<sup>N</sup>
- 5.25 Airport<sup>N</sup>
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station<sup>H</sup>

- 5.31 Landfill or waste treatment site
- 5.32 Plantation
- 5.33 Agriculture
- 5.34 River, stream or wetland
- 5.35 Nature conservation area
- 5.36 Mountain, koppie or ridge ✓
- 5.37 Museum
- 5.38 Historical building
- 5.39 Protected Area
- 5.40 Graveyard
- 5.41 Archaeological site
- 5.42 Other land uses (specify)

If any of the (boxes) features marked with an "N" are highlighted or ticked, how this impact will/ be impacted upon by the proposed activity? N.A.

If any of the features marked with an "An" are highlighted or ticked, how will this impact / be impacted upon by the proposed activity? N.A.

If YES, specify and explain:

If YES, specify:

If any of the features marked with an "H" are highlighted or ticked, how this will impact / be impacted upon by the proposed activity? N.A.

If YES, specify and explain:

If YES, specify:

## 6. CULTURAL/HISTORICAL FEATURES

(KINDLY REFER TO APPENDIX D1: HERITAGE IMPACT ASSESSMENT)

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site?

YES	NO
Uncertain ✓	

If YES, explain:

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

On the site are remains of mine gravel, which was dumped on the site. No important cultural heritage resources or graves have been found on the site.  
 There is no objection to the proposed development from a cultural heritage resources point of view.

Will any building or structure older than 60 years be affected in any way?

YES	NO
	√

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
	√

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

## SECTION C: PUBLIC PARTICIPATION

### 1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated Section 24J of the Act and Government Notice Number R543 must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
  
- (b) giving written notice to—
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority;
  
- (c) placing an advertisement in—
  - (i) one local newspaper; or
  - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
  
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in sub-regulation 54(c) (ii); and
  
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—

- (i) illiteracy;
- (ii) disability; or
- (iii) any other disadvantage.

## **2. CONTENT OF ADVERTISEMENTS AND NOTICES**

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
  - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
  - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
  - (iii) the nature and location of the activity to which the application relates;
  - (iv) where further information on the application or activity can be obtained; and
  - (iv) the manner in which and the person to whom representations in respect of the application may be made.

## **3. PLACEMENT OF ADVERTISEMENTS AND NOTICES**

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

## **4. DETERMINATION OF APPROPRIATE MEASURES**

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

## 5. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

## 6. AUTHORITY PARTICIPATION

**Please note that a complete list of all organs of state/ state departments and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.**

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

List of authorities informed:

NAME	CAPACITY	CONTACT DETAILS
Rustenburg Local Municipality	Governmental stakeholder	PO Box 16, Rustenburg 0300
Department of Water Affairs	Governmental Stakeholder	Private Bag X352, Hartbeespoort, 0216

List of authorities from whom comments have been received:

-
---

## 7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?

YES	NO
	√

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

--

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the **critical or main** issues raised by interested and affected parties.

No issues were raised by interested and affected parties (I&AP's) during the prescribed public participation process (Appendix E). However, the following list of critical or main issues that could have an impact on the environment was compiled by the EAP based on previous experience and specialist input:

#### **Direct**

##### Soils stability

The geotechnical foundation investigation (Appendix D2) refers to the high to medium expansiveness of the subject soils with heave characteristics that may also indicate low bearing capacity.

##### Excavatability

The geotechnical foundation investigation (Appendix D2) also mentions severe problems regarding excavatability that can be expected on portions of the site, especially towards the northern portion where extensive outcrop and suboutcrop of fresh norite were encountered, where blasting will be required for cut and fill operations.

##### Potential underground water contamination

Indiscriminate sanitation systems that interfere with the underground water table may lead to underground water pollution.

#### **Cumulative**

##### Roads network

An uncontrolled proliferation of similar development activities may lead to an exponential increase in heavy vehicle movement on the road network in the immediate vicinity. This may in term lead to the degradation if not disintegration of existing roads if parallel maintenance processes are not embarked upon.

**Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):**

Not applicable.



## 2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

For purposes of the study a systematic generic and judgemental criteria model (refer to Appendix G8) will be used. This model allows for the rating of impact significance in terms of duration, intensity, severity and probability.

### Alternative (preferred alternative)

PHASE:	IMPACT:	RATING:	MITIGATION:	RATING:
<b>Direct impacts:</b>				
Planning & design, construction.	Soils stability	Medium negative	All the black clayey material should be excavated and replaced with suitable material as per the layerworks design for surface beds / slabs in the warehouse, especially due to the heave properties of the upper residual profile. To ensure the stability of excavations, standard sidewall protection in all excavations exceeding 1.5m will be required. Foundation solutions that have been recommended by the geological engineer must be incorporated into structural designs.	Low negative
Planning & design, construction.	Excavatability	Medium negative	Where blasting is to be resorted to, it shall be carried out strictly according to the Explosives Act and regulation of 1956 (Act No. 26 of 1956, as amended).	Low negative
<b>Indirect impacts:</b>				
Planning & design, construction and operational.	Underground water contamination	Medium negative	A sanitation system that does not interfere with the underground water table must be installed. This arrangement will minimize the potential for soils and underground water contamination.	Low negative
<b>Cumulative impacts:</b>				
Planning & design, construction and operational.	Traffic increase	Medium negative	The proliferation of similar developments in the area together with an increase in heavy vehicle movement must be monitored and the necessary road maintenance measures must be identified and executed in a timely fashion.	Low negative

### 3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

#### **Alternative A (preferred alternative)**

##### Overview of assessment

The proposed activity constitutes the development of a portion of Portion 6 Waterval 303 JQ, Rustenburg Local Municipality, North West Province for purposes of establishing warehousing, distribution and supply chain facilities, hazardous goods storage facilities as well as related railway infrastructure.

The total development area is approximately 8 hectares.

Environmental authorisation is being required for the proposed activity in terms of Activities No. 13, 23ii & 53 of Government Regulation No. R. 544 of 18 June 2010.

Mr Cappie Linde from Envirovision Consulting CC has been appointed by the applicant, Anglo American Platinum (Pty) Ltd as the relevant Environmental Assessment Practitioner (EAP) in terms of Subregulation 16 of Government Regulation No. R. 543 of 18 June 2010. Details of the EAP who prepared this report as well as his expertise to carry out basic assessment procedures are contained in Appendix G9.

During the assessment process potential alternatives were considered in relation to the proposed activity. Based on the specific circumstances of the activity and its environment it was determined that the proposed site and activity are appropriate. Site and activity alternatives were thus not considered. Other alternatives relevant to the project such as design and technology alternatives have been embedded in the project proposal and form an integral part of proposed mitigation measures and environmental management measures contained in the relevant EMPR (Appendix F).

The following considerations purport the need and desirability of the proposed development:

- Ownership has already been secured (Appendix G8);
- No objections were received from I&APs during the prescribed public participation process;
- It is supported from an archaeological perspective (Appendix D1); and
- It is supported from a geotechnical perspective (Appendix D2).

##### Assessment of potential impacts

All potential impacts were awarded a medium negative rating during the assessment of potential impacts. According to the systematic generic and judgemental criteria model that was used (Appendix G8) this implies that mitigation measures should be formulated before the proposed project can be approved.

Mitigation measures were accordingly formulated for all potential impacts. All potential impacts were then awarded a low negative rating after the relevant mitigation measures were taken into account. According to the systematic generic and judgemental criteria model that was used (Appendix G8) this implies that it should have no influence on the proposed development project.

##### Environmental impact statement

Based on the findings of the basic assessment process in broad and the assessment of potential impacts in particular, and given the effective application of the recommended mitigating measures, the proposed development should not represent a drastic environmental change with regard to present land use practices, social patterns, socio-economic conditions, seasonal presence and other related aspects.

#### **No-go alternative (compulsory)**

If the development does not continue it will lead to a loss of potential employment opportunities, potential revenue and the strengthening of the local commercial sector.

**SECTION E. RECOMMENDATION OF PRACTITIONER**

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	NO
√	

If “NO”, indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

--

If “YES”, please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

The appointment of an Environmental Control Officer (ECO) for the duration of the construction process.
---

Is an EMPr attached?

YES	NO
√	

The EMPr must be attached as Appendix F.

**SECTION F: APPENDIXES**

The following appendixes must be attached as appropriate:

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

Appendix D1: Heritage impact assessment

Appendix D2: Geotechnical foundation evaluation

Appendix E: Comments and responses report

Appendix F: Environmental Management Programme (EMPr)

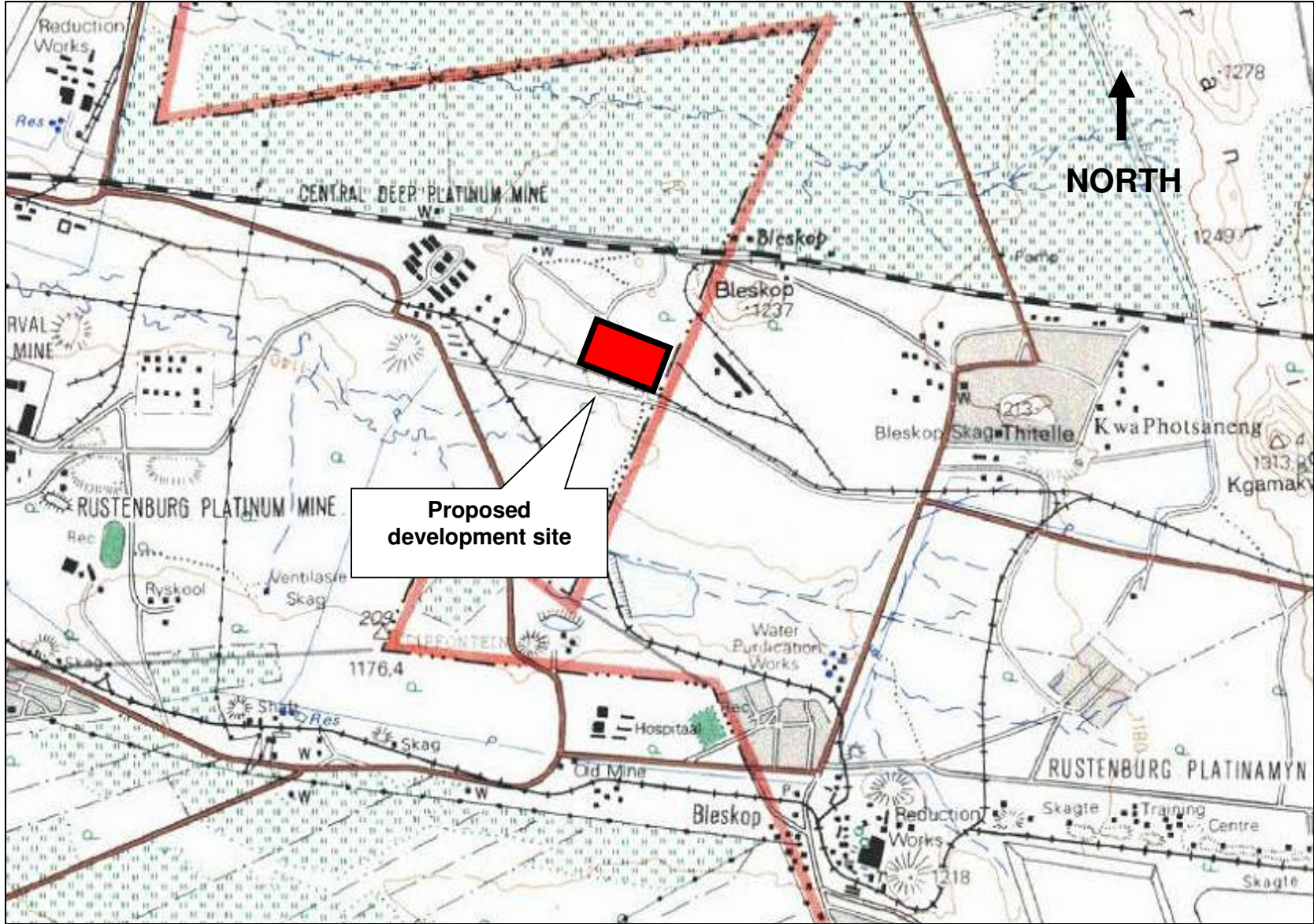
Appendix G: Other information

- Appendix G1: On-site notice
- Appendix G2: Notification of neighbouring landowner, SAHRA & Water Affairs
- Appendix G3: Notification of ward councilor
- Appendix G4: Notification of municipality
- Appendix G5: Advertisement in Gazette
- Appendix G6: Comments and responses
- Appendix G7: Significance Rating Methodology
- Appendix G8: Deeds Office printout
- Appendix G9: Details and expertise of EAP

## **BIBLIOGRAPHY**

DEAT. 2004. Criteria for determining alternatives in EIA, Integrated Environmental Management, Information Series 11. Department of Environmental Affairs and Tourism (DEAT), Pretoria.

**Appendix A: Locality plan (extract of 1:50 000 Topographic Map 2527 CB not to scale)**



## **Appendix B: Photographs**

View from the centre of the property towards the north



View from the centre of the property towards the north east





View from the centre of the property towards the east



View from the centre of the property towards the south east



View from the centre of the property towards the south



View from the centre of the property towards the south west



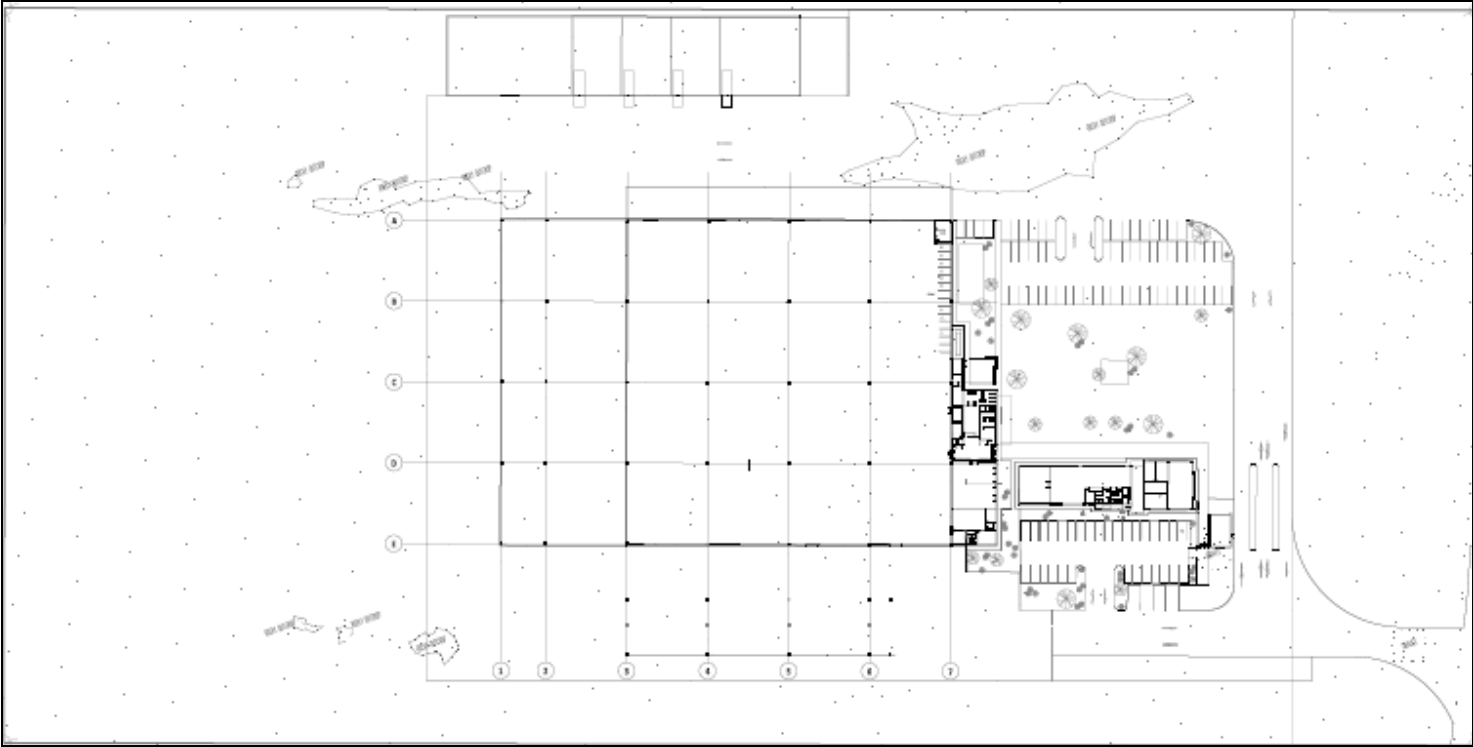
View from the centre of the property towards the west



View from the centre of the property towards the north west



## Appendix C: Facility illustration



## **Appendix D: Specialist reports**

**Appendix D1: Heritage impact assessment**



## AFRICAN HERITAGE CONSULTANTS CC

2001/077745/23

**DR. UDO S KÜSEL**

Tel: (012) 567 6046 Fax: 086 594 9721  
Cell: 082 498 0673  
E-mail: [udo@nconnect.co.za](mailto:udo@nconnect.co.za)

P.O. Box 652  
Magalieskruin  
0150

---

12 June 2013

### PHASE I CULTURAL HERITAGE RESOURCES IMPACT ASSESSMENT FOR THE BLESKOP MINE OF ANGLO AMERICAN PLATINUM DISTRIBUTION CENTRE ON A PORTION OF PORTION 6 FARM WATERVAL 303 JQ RUSTENBURG NORTH WEST PROVINCE

#### A. INFORMATION ON PROJECT:

**Heritage Report prepared by:**

Dr. Udo S. Küsel, African Heritage Consultants CC,  
P.O. Box 652, Magalieskruin, 0150  
Tel: (012) 567 6046; Fax: 086 594 9721; Cell: 082 498 0673  
E-mail: [udo@nconnect.co.za](mailto:udo@nconnect.co.za)

**Developer and consultant and owner and name and contact details:**

**Project applicant:**

Industrial Logistic Systems (on behalf of Anglo American Platinum trading as  
Rustenburg Platinum Mines)  
Contact person: Mr. Peter Boag  
P.O. Box 786677, Sandton, 2146  
Tel: 011 656 508; Cell: 082 553 2783; Fax: 011 656 2642  
E-mail: [peter@ils.co.za](mailto:peter@ils.co.za)



**Landowner:**

Anglo American Platinum (trading as Rustenburg Platinum Mines)

Contact person: André Britz

P.O. Box 1, Bleskop, 0292.

Tel: 014 598 1109; Cell: 083 455 8874; Fax: 014 598 1153

E-mail: [andre.britz@angloamerican.com](mailto:andre.britz@angloamerican.com)

**Consultant:**

Envirovision Consulting CC

Contact person: Cappie Linde

450 Wendy Street, Waterkloof Glen, 0010

Tel: 012 993 5712; Cell: 082 444 0367; Fax: 086 557 9447

E-mail: [envirovision@lantic.net](mailto:envirovision@lantic.net)

**Date: 12 June 2013**

**B. EXECUTIVE SUMMARY**

The proposed development site lies in an area with mixed Bushveld vegetation. The soil is deep clay where sweet grasses grow, which are excellent food for cattle. The site lies near the Swartkoppies granite mountain range, which was preferred by Early Tswana settlers above the sour veldt of the Magalies Mountain. The deep clay soils were avoided by Early Tswana settlers as it is not good for housing and preferred the foot hills of the Swartkoppies Mountain.

On the site are remains of mine gravel, which was dumped on the site. No important cultural heritage resources or graves have been found on the site.

There is no objection to the proposed development from a cultural heritage resources point of view.

---

**C. TABLE OF CONTENTS**

<b>NO</b>	<b>HEADING</b>	<b>PAGE</b>
A.	<i>Information on project</i>	<b>1</b>
B	<i>Executive summary</i>	<b>2</b>
C	<i>Table of contents</i>	<b>3</b>
D	<i>Background information on the project</i>	<b>4</b>
E	<i>Background to the archaeology and history of the area.</i>	<b>5</b>
F	<i>Description of property or affected environment</i>	<b>7</b>
G.	<i>Description of sites identified and mapped</i>	<b>8</b>
H.	<i>Description of the artefacts, fauna, botanical or other finds and features</i>	<b>10</b>
I.	<i>Clear description of burial grounds and graves</i>	<b>10</b>
J.	<i>Field rating</i>	<b>10</b>
K.	<i>Statement of significance</i>	<b>10</b>
L.	<i>Recommendations</i>	<b>10</b>
M.	<i>Conclusion</i>	<b>10</b>
N.	<i>Bibliography</i>	<b>10</b>
O.	<i>Appendix</i> <ul style="list-style-type: none"><li>• <i>Maps see pages</i></li></ul>	<b>11</b>

**D. BACKGROUND INFORMATION ON PROJECT:**

- (a) Whether the report is part of a scoping report/EIA/HIA or not

*The report forms part of an environmental basic assessment process and will be included in the required Basic Assessment Report.*

- (b) Type of development (e.g. low cost housing project, mining etc).

*Commercial (warehousing for mining operation)*

- (c) Whether re-zoning and/or subdivision of land is involved.

*Re-zoning and subdivision may be involved*

- (d) Developer and consultant and owner and name and contact details:

**Project applicant:**

Industrial Logistic Systems (on behalf of Anglo American Platinum trading as Rustenburg Platinum Mines)

Contact person: Mr. Peter Boag

P.O. Box 786677, Sandton, 2146

Tel: 011 656 508; Cell: 082 553 2783; Fax: 011 656 2642

E-mail: [peter@ils.co.za](mailto:peter@ils.co.za)

**Consultant:**

Envirovision Consulting CC

Contact person: Cappie Linde

450 Wendy Street, Waterkloof Glen, 0010

Tel: 012 993 5712; Cell: 082 444 0367; Fax: 086 557 9447

E-mail: [envirovision@lantic.net](mailto:envirovision@lantic.net)

- (e) **Terms of reference**

*To conduct a Heritage Impact Assessment to assess if there is any material of cultural or heritage value under the footprint of the proposed development,*

- (f) **Legislative requirements of Act 25 of 1999.**

PROTECTED SITES IN TERMS OF THE NATIONAL HERITAGE RESOURCES ACT,  
ACT NO. 25 OF 1999

The following are the most important sites and objects protected by the National Heritage Act:

- Structures or parts of structures older than 60 years.

- Archaeological sites and objects.
- Paleontological sites.
- Meteorites.
- Ship wrecks.
- Burial grounds.
- Graves of victims of conflict.
- Public monuments and memorials.
- Structures, places and objects protected through the publication of notices in the Gazette and Provincial Gazette.
- Any other places or objects, which are considered to be of interest or of historical or cultural significance.
- Geological sites of scientific or cultural importance.
- Sites of significance relating to the history of slavery in South Africa.
- Objects to which oral traditions are attached.
- Sites of cultural significance or other value to a community or pattern of South African history

#### **E. BACKGROUND TO THE ARCHAEOLOGY AND HISTORY OF THE AREA.**

Though some Early Middle and Later Stone Age material is found from time to time in the Rustenburg area no major sites occur near the proposed development area. The area on the other hand is well-known for its Late Iron Age sites associated with the Tswana speaking people. Along the Magalies and Swartkoppies Mountain range Küsel U.S. (2007) recorded more than 4000 Late Iron Age sites. Of the sites near Rustenburg the most well known sites are Olifantspoort (Mason, R.J. 1962: 372; 355; 402 – 412) and Molokwane (Pistorius, J.C.C. 1962: 3 – 39).

Most of the sites occur in the Swartkoppies Mountain range north of the Magaliesberg as it is sweet veldt and better grazing for cattle. The Magaliesberg range is sourer veldt with very few sites.



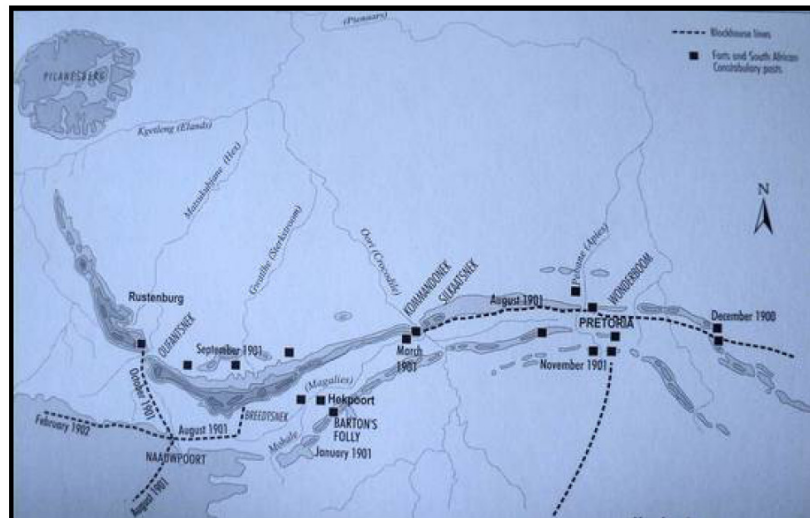
Late Iron Age stonewalled site in the Swartkoppies Mountain range north of the Magaliesberg

---

Some battles of the Second Anglo Boer War also took place in the Rustenburg area (Berg, J.S. 1999: 51 & 54). Of these the battle of Nootgedacht was the most important. Here the Boers killed 109 British soldiers, 186 were wounded and 368 taken prison. The Boers also took 70 laden ox wagons, 200 tents, 700 horses and 500 head of cattle from the British (Cloete, 2000: 205 & 206).

On the 21 July 1900 the Battle of Olifantsnek took place. This was part of the British attempt to relieve Rustenburg. The British won the battle and proceeded to Rustenburg (Carruthers, V. 2000: 303 & 304).

In August 1901 Kitchener began his idea of blockhouses to force the Boer farmers to surrender. One of these blockhouse lines was a seventy-five kilometre line from Frederickstad through Naauwpoort to Breedsnek in the Magaliesberg. Two months later in October 1901 the line was extended westward to Olifantsnek (Carruthers, V. 2000: 326 – 329).



Blockhouse line in Magalies Mountain (Carruthers, V 2000: 329)

The site on the farm Waterval 303 JQ lies between Magalies Mountains and the Swartkoppies Mountain range near Kroondal. The settlement of Kroondal was established by retired officials of the Hermansburg Lutheran Mission Society who worked amongst the Tswana people of the western Transvaal since the middle of the 19<sup>th</sup> century –(Wickert, W. 1949 pp 257 – 274). Here the German settlers established a congregation and build their first church in 1896 as well as a school. Both were declared National Monuments by the previous government. Kroondal as a German settlement is still an active German Lutheran Congregation – see photograph.



The original German  
Lutheran church in  
Kroondal



The original German  
school at Kroondal

## **F. DESCRIPTION OF PROPERTY OR AFFECTED ENVIRONMENT**

### **(a) Detail of area surveyed**

- Full location Data for Province, Magisterial District/Local Authority and property (e.g. farm/erf) name and number etc.;

- (i) Location Province: North West Province, A Portion (approximately eight hectares) of Portion 6 of the Farm Waterval 303 JQ, Bojanala Platinum, District Municipality Rustenburg Local Municipality
- (ii) Location map name: 1/50 000 Rustenburg East 2527 CB
- (iii) Site map attached pages 12 – 13.

**(b) Description of methodology**

The proposed development site is part of the flat land between the Magalies Mountain and the Swartkoppies Mountain range with mixed bushveld. The area was visited and inspected on foot together with the mines surveyor (Mr. Enslin Beetge Chief Surveyor). The area is mainly grassland with a few large trees. Visibility was good as the grass was grazed short. The area was photographed and GPS readings taken.

**G. DESCRIPTION OF SITES IDENTIFIED AND MAPPED**

As already mentioned the site is mixed bushveld which lies between the Magalies Mountain and the Swartkoppies Mountain Range. The site is just south of the Swartkoppies Mountain Range where hundreds of Early Tswana sites occur. The range was preferred by the Tswana people as it is sweet field where the Magalies Mountain is sour veldt. Sweet veldt is preferred by cattle as it is far tastier and more nutritional than sour veldt (Küsel 2007).

The Tswana archaeological sites mainly occur at the foot of the Swartkoppies Granite Hills as the flat areas in the valleys are deep clay soil and not suitable for settlement. The site investigated lies in these deep clay soils – see photograph.



Mixed Bushveld  
vegetation on the site

The surface area of the site has been used in the past for storage of mine crushed stone. All over the site small heaps of this crushed stone is present – see photograph.



Remains of gravel dumping on the site



Remains of gravel dumping on the site

During my investigation the land surveyor showed me two possible grave sites but they turned out to be the remains of crushed stone dumping. One of these is as  $S25^{\circ} 40' 56.4''$  &  $E27^{\circ} 21' 31.6''$  – see photograph.



Remains of gravel dumping on the site which the land surveyor thought are possible graves



No important cultural heritage resources or graves are present on the proposed development area.

**H. DESCRIPTION OF THE ARTEFACTS, FAUNAL, BOTANICAL OR OTHER FINDS AND FEATURES**

None

**I. CLEAR DESCRIPTION OF BURIAL GROUNDS AND GRAVES**

None

**J. FIELD RATING (RECOMMENDED GRADING OF FIELD SIGNIFICANCE)**

None

**K. STATEMENT OF SIGNIFICANCE (HERITAGE VALUE)**

None

**L. RECOMMENDATIONS**

There is no objection to the proposed development from a cultural heritage resources point of view as there are no important cultural heritage resources or graves are present on the site.

If during construction any cultural heritage resources or graves are unearthed all work has to be stopped until the site has been inspected and mitigated by a cultural heritage practitioner.

**M. CONCLUSION**

There are no important cultural heritage resources or graves present on the proposed development area.

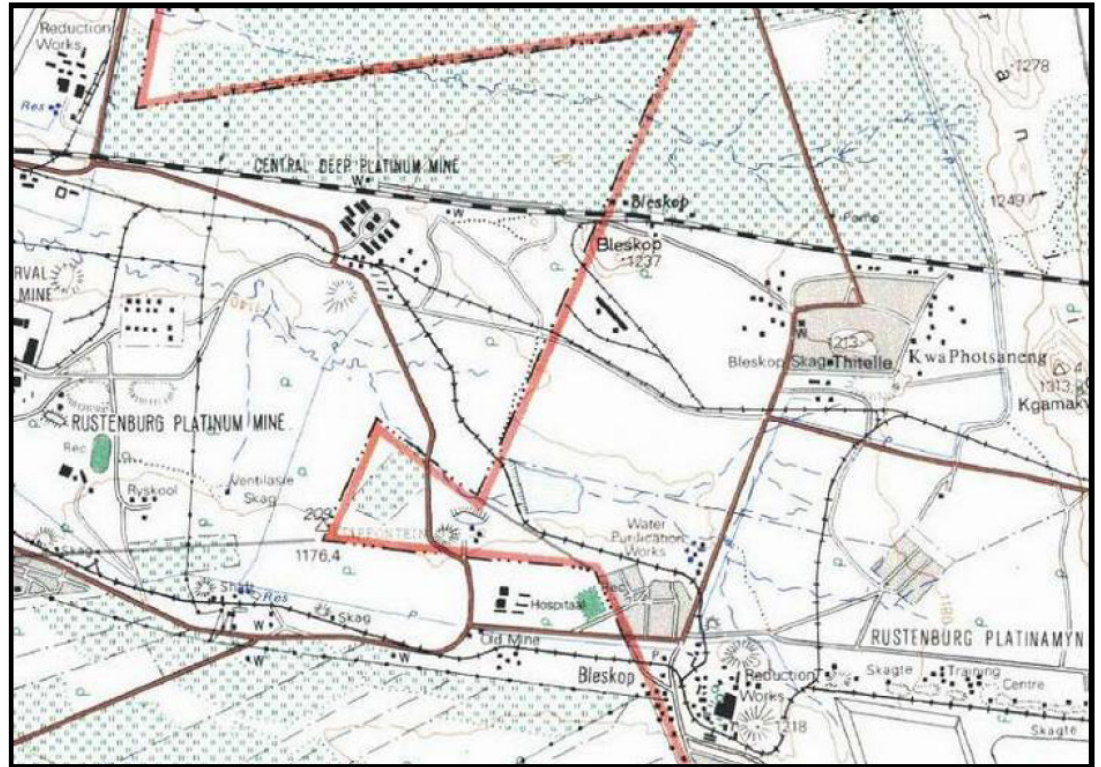
**N. BIBLIOGRAPHY**

- Archaeological database of the National Cultural History Museum Pretoria
- Berg, J.S. 1999. Geskiedenis Atlas van Suid Afrika – Die Vier Noordelike Provinsies
- Carruthers, V. 2000. The Magaliesberg.
- Cloete, P.G. 2000. The Anglo Boer War – A Chronology

- Envirovision Consulting CC Environmental Screening report Proposed Transformation of a Portion of a Portion 6 Waterval 303 JQ Rustenburg Local Municipality North West Province
- Google Maps
- Küsel, U.S. 2007. GIS Database for Historical and Cultural Heritage Sites in the Bojanala District Municipal area of North West Province.
- Küsel, U.S. 2012. Cultural heritage resources impact assessment on remainder of Portion 266 (Portion of Portion 34) of the Farm Waterkloof 305 JQ and a Portion of Portion 19 (Portion of Portion 15) of the Farm Baviaanskrans 308 JQ North West Province
- Mason, R.J. 1962. Prehistory of the Transvaal
- Pistorius, J.C.C. 1992. Molokwane an Iron Age Bakwena Village.
- Wickert, W. 1949. Und die Vögel des Himmels Wohnen unter seinen Zweigen
- 1/50 000 Map 2527 CB Rustenburg East

## **O. APPENDICES**

Maps pages: 12 - 13





**Appendix D2: Geotechnical foundation evaluation**

# **BLESKOP SIDING WAREHOUSE**

## **GEOTECHNICAL FOUNDATION INVESTIGATION**

**to DETERMINE the POTENTIAL for DEVELOPMENT of a WAREHOUSE  
next to the BLESKOP SIDING, RUSTENBURG, NORTHWEST PROVINCE.**

**Georeference: 2527 DA Wolhuterskop**

# **GEOSET cc**

CK 1999/65610/23

**Engineering geologist:**

**DAVID S. VAN DER MERWE**

B.Sc. (Hons)(Enggeol.)(Pret.)

Pr. Sci. Nat. Reg. Nr. 400057/96; MSAIEG Reg. Nr. 93/154; NHBRC Reg. Nr. 600444.

**September 2012**

Report number: GS201209B



## **REPORT ON THE GEOTECHNICAL FOUNDATION INVESTIGATION TO DETERMINE THE POTENTIAL FOR DEVELOPMENT OF A WAREHOUSE NEXT TO THE BLESKOP SIDING, RUSTENBURG, NORTHWEST PROVINCE**

### **1. Introduction**

GEOSET was requested by Me. Jade Fuller of Industrial Logistic Systems Consulting Engineers (Pty) Ltd, on behalf of their client Anglo Platinum Company Group (Pty) Ltd, to conduct a foundation investigation for the planning of a new Warehouse Distribution Centre next to the existing Bleskop Siding, near Rustenburg. The development is to comprise a warehouse structure with first floor offices and substantial loading area and pavements on the same level.

This letter report describes the geotechnical conditions at the above site as found during the site investigation commencing on 31 July 2012, after compiling and attending an acceptable safety induction procedure. Ten test pits (B1 to B10) were excavated with a Cat 426 TLB, supplied by Anglo. Three bulk samples were collected for compaction tests and another four small disturbed samples were submitted for foundation indicator testing. These tests were specifically performed to investigate a suitable pavement solution.

The purpose of the investigation was to recommend suitable foundation solutions for the structure and the pavements, including the floors within the structure. Figure 1 indicates the location of the site, while the test pit positions are indicated in Figure 2.

### **2. Site description and geology**

The site is underlain by norite/gabbro of the Rustenburg suite, Bushveld Complex. The site is relative flat with a slope of approximately 2° in a south-westerly direction, between 1160 and 1166 MASL, a fall across the site of 3,5m to 7,0m. Some uncontrolled and scattered dumping of mining and building rubble has taken place in the centre and south-eastern portion of the site. The remainder of the site is covered with short grass and scattered thorn trees and no structures are present.

### 3. Test pit results

Severe problems regarding excavatability can be expected on portions of the site, especially towards the northern portion where extensive outcrop and sub outcrop of fresh norite rock were encountered, where blasting will be required for cut and fill operations.

#### Test pit Summary

Test Pit Nr	Hillwash / Fill	Residual Reworked Norite (m-m)	Residual Norite (m-m)	Residual Norite tending to soft rock (m-m)	Refusal on medium hard rock Norite m+
B1		0-1,0	1,0-1,3	1,3-2,5	2,5+
B2		0-1,2	1,2-1,4	1,4-2,2	2,2+
B3	0-0,4	0,4-1,6	1,6-1,8	1,8-2,3	2,3+
B4		0-1,0	1,0-1,1	1,1-1,7	1,7+
B5		0-1,0	1,0-1,2	1,2-1,7	1,7+
B6		0-0,8	0,8-1,0	1,0-2,9	2,9+
B7		0-0,8	0,8-1,0	1,0-2,3	2,3+ NR
B8		0-0,7	0,7-0,9	0,9-2,2	2,2+ NR
B9		0-0,9	0,9-1,1	1,1-1,7	1,7+
B10		0-0,8	-	0,8-1,1	1,1+

NR: Near refusal: end of test pit

All the soil profiles were similar and comprised of a top layer of hillwash and reworked norite consisting of sandy clay or turf, with an average thickness of 0,8m, varying from absent (rock outcrop @ 0m) to 1,2m deep, underlain by 0,2m of residual norite. The residual norite comprised brown speckled yellow and grey, firm, micro shattered, sandy clay which was underlain by 0,3m of olive silty sand. This profile was similar to the other test pits except for the much shallower depth and the difference was in the underlying soft rock norite to a depth of 2,2m. At this depth the material tended to medium hard rock. The soft rock norite was highly fractured and excavated as silty sandy gravel and cobbles. The remainder of the test pits comprised similar shallow soil horizons, while deeper sandy residual norite was present and the profile can be generalized as follows:

0-0,8m: Moist, black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Reworked residual norite.

0,8-1,0m: Moist, brown speckled yellow and grey, firm, micro shattered, sandy Clay.

Residual norite.

1,0-2,2m: Slightly moist, grey speckled brown & black, dense becoming very dense with depth, silty Sand, friable sometimes with isolated brown clay patches & occasional white anorthosite bands.

Residual norite, tending to soft rock at base.

2,2+: Near refusal on very dense sand tending to soft or even medium hard rock norite.



The depths from the actual soil profiles were averaged to compile the general soil profile and the attached test pit logs should be considered for specific depths. It should be noted that the profile descriptions are based on field observations and the true soil type is reflected in the laboratory results.

To ensure the stability of excavations, it will need standard sidewall protection in all excavations exceeding 1,5m.

#### **4. Laboratory results**

The foundation indicator test and compaction test results are summarized in the attached Table A.

The two samples from the reworked residual norite or turf had a high PI of 32% to 33% with 0% and 28% clay. The active clay from sample B1 tested as 0%!, and was probably a physically smaller particled highly elastic silt of 61%, deriving a similar activity as active clay. Linear shrinkage was high between 14% and 16%. Both samples had a high potential expansiveness, resulting in potential heave measured at surface of up to 48mm from Van Der Merwe's method of predicting expansiveness. The material classified as MH (inorganic silt, micaceous or fine sandy or silty soil or elastic silt) according to the Unified System, and as A-7-5 as highly compressible silty clay. No compaction tests were performed on these samples as they were deemed unfit for use as construction material.

Sample B1 taken from 1,0 to 1,3m of clayey sand residual norite had a PI of 22% with 28% clay, also classifying as MH. Van Der Merwe's method indicated a medium expansiveness, with a linear shrinkage percentage of 10%. The Unified classification was MH as inorganic silt, micaceous or fine sandy or silty soil or elastic silt. A PRA classification of A-7-5 confirms the presence of high compressibility silty clay. No compaction CBR or MOD testing was done within this horizon.

Bulk samples taken of soft rock norite from B1, B5 and B6 were non plastic or slightly plastic and the PI and Liquid Limits were not determined, with linear shrinkage percentages of less than 1%. Gradings Moduli ranged from 1,37 to 2,08 and the clay percentages from 21% to 62%. It was classified as SM (Silty sand or poorly graded sand silt mixtures) or SW (Well graded sand, gravelly sand with little or no fines) and had a low expansiveness with 1,4%; 0,0% and 0,8% swell respectively. The compaction tests showed a maximum Mod AASHTO dry density of 1957 kg/m<sup>3</sup> at an optimum moisture content of 8,1% for B1, 2022 kg/m<sup>3</sup> @ 4,3% for B5, and 1852 kg/m<sup>3</sup> @ 9,9% for CBR/MOD sample taken from B6, and a COLTO TRH 14 classification of G7, G6 and G6 respectively.

Special undisturbed samples taken of the hillwash and reworked residual norite or black clay or "turf" from Test pit B4 were subjected to Pidgeon's lump test performed in the laboratory.

As this clay is generally known to not have any compaction characteristics, none of this material was submitted for any compaction testing, and it should rather be removed and not be used as construction material.

In the lump test the change in dry density with a change in moisture content is determined and from this, the volumetric swell and percentage volume change of the soil can be calculated. Five to six lumps were taken in situ of an undisturbed block and wrapped individually until testing. The in situ moisture content and dry density were determined from one of the lumps. The remainder of the lumps were allowed to dry out or wet up, keeping in mind that the success of this test depends on determining the choice of how many samples to wet up and how many to dry out, which should depend on an initial estimation of the in situ moisture content of the soil. For example, if the in situ soil is close to saturation, it is prudent to dry out three samples and wet up one. The results along with a graph of dry density against moisture content were given in the lab results in Appendix C.

The percentage volume change of the soil is calculated by

$$\Delta V / V_i \% = [ (\gamma_{di} / \gamma_{df}) - 1 ] 100$$

Where  $V_i$  : 1 cubic metre of soil  
 $\gamma_{di}$  : dry density of the soil corresponding to the dry density at the initial moisture content  
 $\gamma_{df}$  : dry density of the soil corresponding to the final moisture content

The percentage volume change of the soil was calculated at 10,45%. Calculation from natural state to moist in the moisture room to is 15,71% - possibly the nearest to actual expected volume change. The change in density ranged from 1235 kg/m<sup>3</sup> in the dried state to 1778 kg/m<sup>3</sup> in the moisture room, with an increase calculated to 43,97%. This material is not suitable for use as construction material and should be removed.

## **5. Geotechnical evaluation**

The reworked residual norite is medium to highly expansive. From Van der Merwe's method, for the entire thickness of the expansive horizon ranging from surface to 0,7m and up to 1,4m, potential heave of between 16mm to 48mm can be expected at surface across the majority of the site except where the expansive horizon is limited in thickness on top of the soft rock norite, and where less than 15mm of heave is expected.

These upper soil horizons also pose a problem for the surface beds or concrete slabs in the warehouse, especially due to the heave characteristics or expansive properties of this material and associated low bearing capacity.

The stabilization of the reworked residual horizon should indicate a substantial increase in the strength of the material as well as a decrease in the plasticity. This improvement of the engineering properties of the in situ soil could be considered adequate for utilization in the construction of suitable pavement layers. It should however be noted that strict control will be required during the construction phase to maintain proper mixing and placement of stabilized layers. We therefore recommend that in this case the upper reworked residual norite or black turf be removed, and either be replaced by an engineered fill, or the implementation of a piled foundation system.

## **6. Construction materials**

Commercial suppliers of construction material and the surrounding mines should be investigated as their classified material should be fit for use in the layer works of the warehouse and roads.

Alternatively, cut and fill operations on site will probably supply material of high quality from the upper part of the site to be used as fill on the lower parts, and the proper compaction of these engineered layers should be controlled during the construction phase.

Care should be taken in preventing differential movement possible when founding on solid rock and fill, and we recommend that the cutting within solid rock to be made deeper than the founding level, and then recompacted to founding level to ensure similar foundation conditions across the site.

## **7. Conclusions and Foundation recommendations**

The reworked residual norite horizon is not considered suitable as founding horizon for pad footings or the strip foundations. Shallow spread footings should be founded below the clayey reworked horizon on the sandy residual norite. The underlying sandy residual norite was dense, and an allowable bearing capacity of 200kPa is considered applicable at a founding depth of 1,0m to 1,2m. Water ingress into the subsoil should be restricted at all cost in order to limit moisture content increase or fluxuation in the expansive and compressible reworked horizon.

It is recommended to excavate and replace all the black clayey material with suitable material as per the layerworks design for surface beds / slabs in the warehouse, especially due to the heave characteristic of the upper residual profile. The stabilization of the in situ material appear not to be a viable option, although the proper processing of the material and mixing of lime may be problematic for the contractor.

Refusal and near refusal of a competent TLB on soft tending to medium hard rock norite, as well as the compaction character of the material will be suitable for founding pressures in excess of 300kPa, and will be suitable for the foundations. If filling thickness is found to be too excessive during fill and cut operations, piling should be considered on the soft to medium hard rock, with expected length in the order of between less than 1,0m to up to 1,7 and a maximum of 10m at the western corner.

The fill material in the south-eastern corner of the site also needs to be removed.

Feel free to contact us if you have any queries.



David S van der Merwe PrSciNat (Director)

**Table A Summary of Laboratory Results**

Nr	Depth m	Material Description	Origin	Clay %	Classification		% Linear Shrinkage	Plasticity Index	Liquid Limit	Expan- siveness
					Unified	PRA				
B1	0,4-0,5	Sandy Silt	RRN	0?	MH	A-7-5	16	33	72	L/H?
B1	1,0-1,3	Sandy Silt	RN	28	MH	A-7-5	10	22	43	M
B1	1,3-2,5	Gravelly sand	N	2	SM	A-2-5	1	SP	ND	L
B4	0-1,0	Sandy Silt	RRN	28	MH	A-7-5	14	32	76	H
B4	1,1-1,7	Gravelly sand	N	0	SW-SM	A-1-b	0	NP	ND	L
B5	1,2-1,7	Gravelly sand	N	0	SW	A-1-b	0	NP	ND	L
B6	0,9-2,9	Gravelly sand	N	0	SM	A-2-5	1	SP	ND	L
Material possibly expansive if value:				>12%			>8%	>12	>30	Exp?

RRN: Reworked residual norite RN: Residual norite N: Soft rock Norite

**Table A Legend**

Unified

According to the revised ASTM-Standard on the "Unified Soil Classification System" (Weinert).

MH: Inorganic silt, micaceous or fine sandy or silty soil, elastic silt.

SM: Silty sand; poorly graded sand silt mixtures

SW: Well graded sand, gravelly sand with little or no fines.

ML: Inorganic silt & fine sand, silty or clayey fine sand with slight plasticity.

PRA

"Public Roads Classification" (Brink, Partridge & Williams).

A-1-b: Gavelly sand or graded sand may include fines.

A-2-5: Sand & gravel with elastic silt fines.

A-7-5: High compressibility silty clay.

Expansiveness according to Van der Merwe's method (Brink, Partridge & Williams).

L: Low

M: Medium

H: High

A clayey material is potentially expansive if it exhibits the following properties (Kantey and Brink, 1952):

a clay content greater than 12 percent,

a linear shrinkage of more than 8 percent,

a plasticity index of more than 12, and

a liquid limit of more than 30 percent

NP: Not plastic: sandy material with no cohesion

ND: not determined

# Bleskop

## Geoset

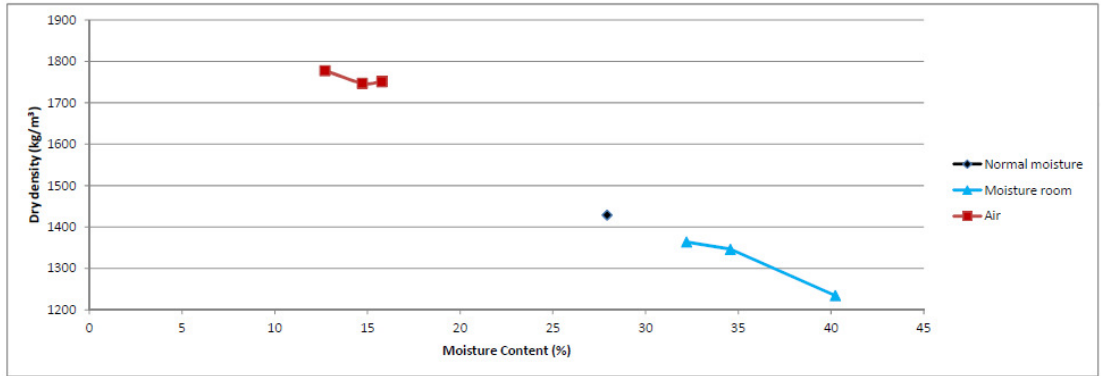
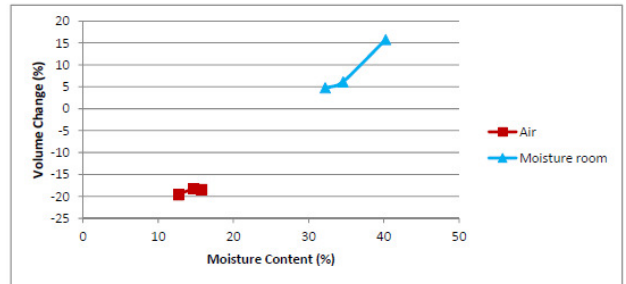
Date: 2012/08/29  
Soillab job number: S12-1042  
Tests done: Pidgeon Lump Test

<b>SOILLAB</b>	(PTY) LTD	230 Albertus Street	P O Box 72928
	Reg No 1971/000112/07	La Montagne 0184 Tel (012) 481-3999	Lynnwood Ridge 0040 Fax (012) 481-3812

# Pidgeon Lump Test

Project: Bleskop  
 Client: Geoset  
 Date: 2012/08/30

		Moisture content (%)	Volume Change (%)	Dry density (kg/m <sup>3</sup> )
Natural Moisture		27.9		1429
Air	1 day	15.8	-18.4	1751
	2 days	14.7	-18.2	1747
	3 days	12.7	-19.6	1778
Moisture room	1 day	32.2	4.8	1364
	2 days	34.6	6.1	1346
	3 days	40.2	15.8	1235



SOILLAB	(PTY) LTD	230 Albertus Street	P O Box 72928
	Reg No 1971/000112/07	La Montagne 0184	Lynnwood Ridge 0040
		Tel (012) 481-3999	Fax (012) 481-3812

## SOIL PROFILES

<b>Soil Profile Nr: B1</b> <b>DATE: 31 July 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		<div style="text-align: center; border-bottom: 2px solid black; padding-bottom: 5px;"> <b style="font-size: 1.2em;">GEOSET CC</b> </div> <div style="font-size: 0.8em; text-align: center;"> <b>Consulting Engineering &amp; Environmental Geologists</b>  <b>Raadgewende Ingenieurs- en Omgewingsgeoloë</b> </div> <div style="font-size: 0.7em; text-align: center;">                 P.O. Box / Posbus 60995      <b>Tel:</b> (012) 525 1004                  KAREN PARK 0118              <b>Webfax:</b> 086 658 3190  <b>e-mail:</b> davidsvdm@webmail.co.za      <b>Cell:</b> (082) 925 4075  <b>Engineering Geologist:</b> David S. van der Merwe.  <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.             </div>	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			
0.20			
0.30			
0.40		B1:0,4-0,5	
0.50		●	Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.60			
0.70			
0.80			
0.90			
1.00			
1.10			
1.20		●	Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
1.30			
1.40		} CBR	Slightly moist, grey speckled brown & black, dense becoming very dense from 1,8m, silty Sand, friable with isolated brown clay patches & occasional white anorthosite bands. Residual norite, tending to soft rock at base.
1.50			
1.60			
1.70			
1.80			
1.90			
2.00			
2.10			
2.20			
2.30			
2.40			
2.50			
2.50 +			Refusal on residual norite tending to soft rock.

**Notes:**

1. Refusal of TLB @2,5m+ on residual norite tending to soft rock at base.
2. No groundwater was intersected.
3. ● Disturbed samples B1:0,4-0,5 and B1:1,0-1,3 were taken.
4. MOD/CBR sample was taken from 1,3 to 2,5m.

## SOIL PROFILES

<b>Soil Profile Nr: B2</b> <b>DATE: 31 July 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		<b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel: (012) 525 1004</b> KAREN PARK 0118 <b>Webfax: 086 658 3190</b> e-mail: <a href="mailto:davidsvdm@webmail.co.za">davidsvdm@webmail.co.za</a> <b>Cell: (082) 925 4075</b> <b>Engineering Geologist: David S. van der Merwe.</b> <b>Ingenieursgeoloog: Pr. Sci. Nat., MSAIEG.</b>	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.20			
0.30			
0.40			
0.50			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
0.60			
0.70			
0.80			
0.90			
1.00			
1.10			
1.20			
1.30			Slightly moist, grey speckled brown & black, dense becoming very dense with depth, silty Sand, friable with isolated brown clay patches & occasional white anorthosite bands.
1.40			
1.50			Residual norite.
1.60			Slightly moist, grey speckled brown & black, dense becoming very dense from 1,8m, silty coarse Sand, friable with isolated brown clay patches. Residual norite, tending to soft rock at base.
1.70			
1.80			
1.90			
2.00			
2.10			
2.20			
2.20 +			Refusal on soft rock norite.


**Notes:**

1. Refusal of TLB @2.2m+ on residual norite tending to soft rock at base.
2. No groundwater was intersected.
3. No samples were taken.

Soil Profiles Bleskop Siding Rustenburg



**SOIL PROFILES**

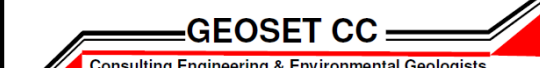
<b>Soil Profile Nr: B3</b> <b>DATE: 31 July 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KAREN PARK 0118 <b>Webfax:</b> 086 658 3190 e-mail: <a href="mailto:davidsvdm@webmail.co.za">davidsvdm@webmail.co.za</a> <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10	<#%&*>		Abundant, (50-60%) norite & anorthosite gravel & cobbles in a silty sand grading to black clay matrix. Fill.
0.20	<#%&*>		
0.30	<#%&*>		
0.40	<#%&*>		
0.50			Black speckled white mottled brown, stiff, shattered, sandy Clay. Residual reworked norite.
0.60			
0.70			
0.80			
0.90			
1.00			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
1.10			
1.20			
1.30			
1.40			
1.50			
1.60			
1.70			Slightly moist, grey speckled brown & black, dense becoming very dense with depth, silty Sand, friable with isolated brown clay patches. Residual norite.
1.80			
1.90			Slightly moist, grey speckled brown & black, dense becoming very dense silty coarse Sand, friable with isolated brown clay patches. Residual norite, tending to soft rock at base.
2.00			
2.10			
2.20			
2.30			
2.30 +			

Notes:

1. Refusal of TLB @2,3m+ on residual norite tending to soft rock at base.
2. No groundwater was intersected.
3. No samples were taken.

Soil Profiles Bleskop Siding Rustenburg

**SOIL PROFILES**

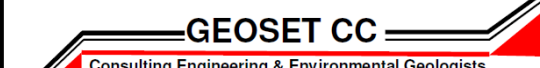
<b>Soil Profile Nr: B4</b> <b>DATE: 31 July 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KARENPAK 0118 <b>Webfax:</b> 086 658 3190 <b>e-mail:</b> davidsvdm@webmail.co.za <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			
0.20			
0.30			
0.40			
0.50		●	Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.60		B4: 0-1,0	
0.70			
0.80			
0.90			
1.00			
1.10			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
1.20			
1.30			
1.40		●	Slightly moist, grey speckled black mottled olive, dense becoming very dense, friable, silty coarse sand with gravel. Residual norite, tending to very soft rock at base.
1.50		B4:1,1-1,7	
1.60			
1.70			
1.70 +			Refusal on very soft rock norite.

**Notes:**

1. Refusal of TLB @1,7m+ on very soft rock residual norite.
2. No groundwater was intersected.
3. ● Disturbed samples B4:0-1,0 and B4:1,1-1,7 were taken for foundation indicator testing.

Soil Profiles Bleskop Siding Rustenburg

**SOIL PROFILES**


<b>Soil Profile Nr: B5</b> <b>DATE: 31 July 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KARENPARK 0118 <b>Webfax:</b> 086 658 3190 <b>e-mail:</b> davidsvdm@webmail.co.za <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.20			
0.30			
0.40			
0.50			
0.60			
0.70			
0.80			
0.90			
1.00			
1.10			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
1.20			Slightly moist, grey speckled black mottled olive, dense becoming very dense, friable, silty coarse sand with gravel. Residual norite, tending soft rock at base.
1.30		} CBR	
1.40			
1.50			
1.60			
1.70			
1.70 +			Refusal on soft to medium hard rock norite.

Notes:

1. Refusal of TLB @1,7m+ on soft to medium hard rock residual norite.
2. No groundwater was intersected.
3. MOD/CBR sample was taken from 1,2 to 1,7m.

Soil Profiles Bleskop Siding Rustenburg

**SOIL PROFILES**


<b>Soil Profile Nr: B6</b> <b>DATE: 31 July 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KAREN PARK 0118 <b>Webfax:</b> 086 658 3190 <b>e-mail:</b> davidsvdm@webmail.co.za <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.20			
0.30			
0.40			
0.50			
0.60			
0.70			
0.80			
0.90			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
1.00			
1.10	\\:\\:\\:\\:\\	} CBR	Slightly moist, grey speckled black mottled olive, dense becoming very dense, friable, silty coarse sand with gravel. Residual norite, tending soft rock at base.
1.20	\\:\\:\\:\\:\\		
1.30	\\:\\:\\:\\:\\		
1.40	\\:\\:\\:\\:\\		
1.50	\\:\\:\\:\\:\\		
1.60	\\:\\:\\:\\:\\		
1.70	\\:\\:\\:\\:\\		
1.80	\\:\\:\\:\\:\\		
1.90	\\:\\:\\:\\:\\		
2.00	\\:\\:\\:\\:\\		
2.10	\\:\\:\\:\\:\\		
2.20	\\:\\:\\:\\:\\		
2.30	\\:\\:\\:\\:\\		
2.40	\\:\\:\\:\\:\\		
2.50	\\:\\:\\:\\:\\		
2.60	\\:\\:\\:\\:\\		
2.70	\\:\\:\\:\\:\\		
2.80	\\:\\:\\:\\:\\		
2.90	\\:\\:\\:\\:\\		
2.90 +			No refusal on soft rock norite.

**Notes:**

1. No refusal of TLB @2,9m+ on soft rock residual norite.
2. Test pit few metres away from solid rock fresh norite outcrop!
3. No groundwater was intersected.
4. MOD/CBR sample was taken from 0,9 to 2,9m.

Soil Profiles Bleskop Siding Rustenburg

**SOIL PROFILES**


<b>Soil Profile Nr: B7</b> <b>DATE: 1 August 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KARENPAK 0118 <b>Webfax:</b> 086 658 3190 <b>e-mail:</b> davidsvdm@webmail.co.za <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.20			
0.30			
0.40			
0.50			
0.60			
0.70			
0.80			
0.90			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
1.00			
1.10	\\:\\:\\\\		Slightly moist, grey speckled black mottled olive, dense becoming very dense, friable, silty coarse sand with gravel. Residual norite, tending soft rock at base.
1.20	\\:\\:\\\\		
1.30	\\:\\:\\\\		
1.40	\\:\\:\\\\		
1.50	\\:\\:\\\\		
1.60	\\:\\:\\\\		
1.70	\\:\\:\\\\		
1.80	\\:\\:\\\\		
1.90	\\:\\:\\\\		
2.00	\\:\\:\\\\		
2.10	\\:\\:\\\\		
2.20	\\:\\:\\\\		
2.30	\\:\\:\\\\		Near refusal on soft rock norite.
2.30 +			

**Notes:**

1. Near refusal of TLB @2,3m+ on soft rock residual norite.
2. Test pit trench dug from solid rock fresh norite outcrop southwards.
3. No groundwater was intersected.

Soil Profiles Bleskop Siding Rustenburg


**SOIL PROFILES**

<b>Soil Profile Nr: B8</b> <b>DATE: 1 August 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KAREN PARK 0118 <b>Webfax:</b> 086 658 3190 <b>e-mail:</b> davidsvdm@webmail.co.za <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.20			
0.30			
0.40			
0.50			
0.60			
0.70			
0.80			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
0.90			
1.00			Slightly moist, grey speckled black mottled olive, dense becoming very dense, friable, silty coarse sand with gravel. Residual norite, tending soft rock at base.
1.10			
1.20			
1.30			
1.40			
1.50			
1.60			
1.70			
1.80			
1.90			
2.00			
2.10			
2.20			
2.20 +			Near refusal on soft rock norite.

**Notes:**

1. Near refusal of TLB @2.2m+ on soft rock residual norite.
2. No groundwater was intersected.


**SOIL PROFILES**

<b>Soil Profile Nr: B9</b> <b>DATE: 1 August 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>GEOSET CC</b> Consulting Engineering & Environmental Geologists Raadgewende Ingenieurs- en Omgewingsgeoloë P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KAREN PARK 0118 <b>Webfax:</b> 086 658 3190 <b>e-mail:</b> davidsvdm@webmail.co.za <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.20			
0.30			
0.40			
0.50			
0.60			
0.70			
0.80			
0.90			
1.00			Moist, brown speckled yellow & grey, firm, micro shattered, sandy Clay. Residual norite.
1.10			
1.20	\\:\\:\\:\\:\\		Slightly moist, kaki grey speckled black mottled olive, dense becoming very dense, friable, silty coarse sand with gravel. Residual norite, tending soft rock at base.
1.30	\\:\\:\\:\\:\\		
1.40	\\:\\:\\:\\:\\		
1.50	\\:\\:\\:\\:\\		
1.60	\\:\\:\\:\\:\\		
1.70	\\:\\:\\:\\:\\		
1.70 +			Refusal on soft to medium hard rock norite.

Notes:

1. Refusal of TLB @1,7m+ on soft to medium hard rock residual norite.
2. No groundwater was intersected.

**SOIL PROFILES**

<b>Soil Profile Nr: B10</b> <b>DATE: 1 August 2012</b> <b>Job Nr: GS201208B: Bleskop</b> <b>PROJECT NAME: Bleskop Siding</b> <b>CLIENT: Anglo</b> <b>CLIENT: ILS: Jade Fuller</b> <b>Contractor: Anglo</b> <b>TLB Machine: CAT 426</b> <b>Operator: Abraham</b>		 <b>Consulting Engineering &amp; Environmental Geologists</b> <b>Raadgewende Ingenieurs- en Omgewingsgeoloë</b> P.O. Box / Posbus 60995 <b>Tel:</b> (012) 525 1004 KAREN PARK 0118 <b>Webfax:</b> 086 658 3190 <b>e-mail:</b> davidsvdm@webmail.co.za <b>Cell:</b> (082) 925 4075 <b>Engineering Geologist:</b> David S. van der Merwe. <b>Ingenieursgeoloog:</b> Pr. Sci. Nat., MSAIEG.	
Depth (m)	Soil Profiles	Sample Nr Symbols	Description of soil and properties
0.10			Black speckled white mottled brown, stiff, fissured & slicken sided, sandy Clay. Residual reworked norite.
0.20			
0.30			
0.40			
0.50			
0.60			
0.70			
0.80			
0.90			Slightly moist, kaki speckled black mottled red, dense becoming very dense, friable, silty coarse sand with gravel. Residual norite.
1.00			
1.10			
1.10 +			Refusal on soft to medium hard rock norite.

**Notes:**

1. Refusal of TLB @1,1m+ on soft to medium hard rock residual norite.
2. No groundwater was intersected.