



Anglo American Inyosi Coal (Pty) Limited

Draft

Amended Environmental Management Programme (EMPr) Report

Compiled in terms of Appendix 3 and Appendix 4 of the Amended Environmental Impact Assessment Regulations, 2014 (Government Notice No. R 326) (EIA Regulations, 2014) and Submitted as contemplated in Regulation 32(a) of Chapter 5 of the EIA Regulations, 2014

For

The Zibulo Colliery Opencast Mining Operations

DMR Reference No: MP 30/5/1/2/2/338 MR

August 2020

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Amended EMPr Report
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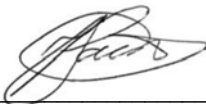
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I hereby declare:

1. I have no vested interest (present or prospective) in the project that is the subject of this report as well as its attachments. I have no personal interest with respect to the parties involved in this project.
2. I have no bias with regard to this project or towards the various stakeholders involved in this project.
3. I have not received, nor have I been offered, any significant form of inappropriate reward for compiling this report.



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EXECUTIVE SUMMARY

Zibulo Colliery, which is a Division of Anglo American Inyosi Coal (Pty) Ltd, is an operational coal mine located some 26 km southwest of eMalahleni in the Nkangala District Municipality within the Mpumalanga Province. Zibulo Colliery, formerly Zondagsfontein Project, is a member of the Anglo-American group of companies, and is the first major project to be undertaken by the flagship empowerment company Anglo American Inyosi Coal (Pty) Ltd. Construction of the colliery started in 2008, and full production was reached in 2015. The mine is operated under water use licences 04/B20G/AGJ/809 (Opencast) and 06/B11G/7383 (Water Transfer Pipeline), and approved EMPR (17/2/13 NK 31) with DMR reference number: MP 30/5/1/2/2/338 MP.

Mining at the Zibulo Colliery Opencast is undertaken by opencast mining methods using truck and shovel. Run-of-mine (ROM) coal at the opencast workings is deposited at the ROM stockpiling areas, which feeds the beneficiation plant at the Phola Washing Plant complex via an overland conveyor belt. Dirty water management structures are used for the collection, storage and re-use of dirty water generated at the operational opencast mining operations. Groundwater and storm water runoff within the opencast pit are pumped to the PCD's.

Excess water from their underground and opencast operations is sent to the eMalahleni Water Reclamation Plant via an existing 26 km water transfer pipeline. The water is treated by the eMalahleni Water Reclamation Plant and potable water is then pumped back to the Zibulo Colliery Opencast operation via the same 26 km pipeline and used for various mining related operations.

During 2019, Anglo American Inyosi Coal (Pty) Limited conducted external environmental audits. These audits found various gaps in, out-dated, non-applicable and incorrectly stated commitments within the approved EMPr of the Zibulo Opencast Operation. It was then recommended through the audit process, that the approved EMPr be amended to address the inadequacies/ shortcomings¹, and mis-aligned commitments, and to ensure that Zibulo Colliery effectively runs its operations while ensure compliance with all of the required environmental legislations. These amendments were firstly compared with GN 324, GN 325 and GN 327 of the amended Environmental Impact Assessment Regulations, 2014, to establish if new listed activities were triggered. Secondly, an Environmental Impact Assessment (EIA) was conducted to determine the impact of these amendments on the environment. The suggested amendments do not trigger any new listing notices. Based on the recommendations of the external audit an EIA was conducted based on the findings. The outcome of this EIA and the mitigation measures suggested will be used to determine the proposed new, amended or removal of redundant commitments. These proposed new, amended and removal of redundant commitments will be provided to the Department of Mineral Resources and Energy (DMRE).

This document (Anglo American Inyosi (Pty) Limited: Zibulo Colliery – Opencast Operation Amended Environmental Management Programme (EMPr) Report) concerns the amendment of various commitments within the approved EMPr as per the previously mentioned external environmental audits. Further, the proposed changes/ additions to impacts to the EMPr, as well as proposed amendments to the Zibulo Opencast Environmental Authorisation are also included in this report.

¹ Identified as part of the Regulation 34 process (undertaken in terms of the EIA Regulations, 2014)

In terms of Regulation 31 of the EIA Regulations, 2014 and the fact that proposed changes/ amendments will result in a change to the scope of the approved Zibulo Colliery's EMPr will result in a change in the nature of impact and that change was not taken into consideration in the initial environmental authorisation application, it will be necessary that the approved Zibulo Colliery's EMPr be amended to include the new/ changed commitments, or the removal of redundant commitments. According to Regulation 32 of the EIA Regulations, 2014, assessment of all impacts, advantages and disadvantages related/ associated with the proposed change and measures to ensure avoidance, management and mitigation of impacts associated with such proposed change, together with the amended EMPr must be submitted to the DMR (competent authority) after having been subjected to public participation for approval. This document is hence submitted in order to meet the requirements of Regulation 32 of the EIA Regulation.

This document was compiled in terms of Regulation 31 and 32 of the amended EIA Regulations, 2014 and is hereby submitted. It must also be noted that no listed activities are triggered in terms of NEMA, 1998 (Act No: 107 of 1998), Amendment of the Environmental Impact Assessment Regulations Listing Notice 1 (GN 327), 2 (GN 325) and 3 (GN 324) of 2014. No waste management licence will be required in terms of the National Environmental Management: Waste Act (NEMWA) (Act No. 59 of 2008) and its regulations.

Environmental baseline data has been obtained through various agencies, pertaining to surface water quantities and qualities, geohydrological data and modelling, topographical analyses, soil surveys, vegetation surveys, wetland surveys and geological conditions. Weather data was acquired from the nearby rainfall station as well as from the South African Weather Service. Historic land use was determined through available data and by visual observations made during various field studies. The data accumulated and analysed is sufficient to gain a baseline indication of the present state of the environment. The use of this baseline study for impact assessments is thus justified, and reliable conclusions could be made. The impacts could arise during and after the proposed project were determined and ranked according to their significance. Based on the impact assessment, recommendations were made for the mitigation of significant negative environmental impacts that will result from the proposed project.

SECTION ONE

Introduction

1. INTRODUCTION

1.1 WHO IS DEVELOPING THE EMPR AMENDMENT REPORT?

1.1.1 Name and Contact Details of the EAP who Prepared the EMPR Amendment Report

EAP:	Mr. P. Fourie (Cand. Sci. Nat.)
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IAIA Membership No.:	5623
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1.1.2 Expertise of the EAP who Prepared the EMPR Amendment Report

Geovicon Environmental (Pty) Limited is a geological and environmental consulting company. The company was formed during 1996, and currently has twenty-one years' experience in the geological and environmental consulting field. Geovicon Environmental (Pty) Limited has successfully completed consulting areas in the Mining sector (coal, gold, base metal and diamond), Quarrying sector (sand, aggregate and dimension stone), Industrial sector and housing sector. Geovicon Environmental (Pty) Limited has undertaken contracts within all the provinces of South Africa, Swaziland, Botswana and Zambia. During 2001 Geovicon Environmental (Pty) Limited entered the field of mine environmental management and water monitoring.

Geovicon Environmental (Pty) Limited is a Black Economically Empowered Company with the BEE component owning 60% of the company. Geovicon Environmental (Pty) Limited has three members i.e. O.T Shakwane, J.M. Bate and T.G Tefu.

Mr. O.T Shakwane obtained his BSc (Microbiology and Biochemistry) from the University of Durban Westville in 1994, and completed his honours degree in Microbiology in 1995. Mr O.T Shakwane has also completed short courses on environmental law and environmental impact assessment with the University of North West's Centre for Environmental Management. He has worked with the three state departments tasked with mining and environmental management i.e. Department of Water and Sanitation (Gauteng and Mpumalanga Region), Department of Mineral Resources (Mpumalanga

Region) and Department of Agriculture, Conservation and Environment (Gauteng Region). Mr. Shakwane has been in the consulting field since 2004 and has completed various areas similar to the proposed Anglo American Inyosi Coal (Pty) Ltd Zibulo Colliery's EMPr amendment report project as an environmental assessment practitioner. He is registered with the South African Council for Natural Scientific Professions as a Professional Natural Scientist in terms of the section 20(3) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003). He is also a member of the International Association for Impact Assessment, South Africa.

Over the past years Geovicon Environmental (Pty) Limited has formalised working relationships with companies that offer expertise in the following fields i.e. Geohydrology, Civil and Geotechnical Engineering, Geotechnical Consultancy, Survey and Mine Planning and Soil & Land Use Consultancy. Geovicon Environmental (Pty) Limited is an independent consulting company, which has no interest in the outcome of the decision regarding the EMPr amendment application for the Anglo American Inyosi Coal (Pty) Ltd: Zibulo Colliery – Opencast Operation.

1.2 WHO WILL EVALUATE AND APPROVE THE EMPr AMENDMENT REPORT?

Before the proposed project changes can be commenced with, an Environmental Assessment Practitioner (EAP) must be appointed to apply for amendment of the environmental authorization and to compile an amended EMPr as stipulated in Regulation 31 and Regulation 32(1)(a)(iv) of the EIA Regulations, 2014 for the proposed project changes. An environmental impact assessment must be undertaken in support of the amendment of the EMPr. The environmental impact assessment will determine the potential environmental impacts that may result from the proposed EMPr changes and an amended environmental management programme report (this report) is compiled to provide measures for mitigation against the identified impacts. The above-mentioned amendment must be made to the competent authority in terms of section 24D (1) of NEMA. The Minister responsible for mineral resources is the responsible competent authority for this amendment application and amended EMPr. In view of the above, the amendment for the environmental authorisation for the repositioning of the mine infrastructures is submitted to the Department of Mineral Resources and Energy (DMRE), eMalahleni Regional Office for their consideration and decision making. All changes made in the approved EMPr has been underlined in the amended EMPr.

In the spirit of co-operative governance and in compliance with the requirements of NEMA and the MPRDA, the competent authority will, during the processing of the amendment application, consult with other organs of state that administers laws that relate to matters affecting the environment relevant to this application.

Note that during the public participation process for the proposed project, the EAP will also consult with the below listed state authorities.

The organs of state that are to be consulted may include the following:

- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA)
- Mpumalanga Tourism and Parks Agency (MTPA)
- Department of Water and Sanitation (DWS)

- National Department of Agriculture, Forestry and Fisheries (NDAFF)

Note however that this list is not exhaustive as more organs of state may be identified by the competent authority and EAP during the public participation process.

1.3 DETAILS OF THE APPLICANT

1.3.1 Name of the Applicant

Anglo American Inyosi (Pty) Limited

1.3.2 Name of the Project

Zibulo Colliery Opencast: EMPr Amendment Report

1.3.3 Postal Address of Applicant

P. O. Box 440

Ogies

2230

1.3.4 Responsible Person

Mr. Melchior Joseph

1.3.5 Contact Person

Mr. Melchior Joseph

SECTION TWO

Description of the Scope of the Proposed Project

2. DESCRIPTION OF THE SCOPE OF THE PROPOSED PROJECT

2.1 DESCRIPTION OF THE PROPOSED ZIBULO COLLIERY OPENCASTS' EMPr AMENDMENT

Zibulo Colliery Opencast is an operational opencast mining situated on portions 19, 39, 04. 41 and 64 of the Oogiesfontein 4 IS and portion 41 of the farm Klipfontein 3 IS within the eMalahlani Local Municipality and the Nkangala District Municipality, Mpumalanga Province (SRK, [2009](#)). Zibulo Colliery is operated under a mining right issued in terms of Section 23 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) (MP 30/5/1/2/2/338 MR) and an Environmental Authorisation (EA) from the Mpumalanga Department of Economic Development, Environment and Tourism (17/2/2/2 NK – 1). Zibulo Colliery Opencast Operation is also in possession of two water use licenses: 04/B20G/AGJ/809 (Opencast) and 06/B11G/7383 (Water Transfer Pipeline). Currently the Zibulo Colliery is operational, extracting coal from the opencast pit through the rollover mining technique.

2.1.1 Planned Life of the Project

The current estimated life of Zibulo Colliery - Opencast is 7 years.

2.2 REASONS FOR THE AMENDMENT OF THE EMPr

Anglo American Inyosi Coal (Pty) Ltd conducts yearly external environmental audits to ensure compliance with the commitments within the approved EMPr and EAs. During the 2019 external environmental audit the inadequacies in terms of Regulation 34 of the EIA Regulations, 2014 were identified and it was recommended that the relevant sections/ impacts/ commitments (within the approved EMPr) be updated, removed, amended or reworded (Shangoni, [2019](#)). By amending the NEMA EA and the approved Zibulo Colliery's EMPr (Part 2 amendment, as per the NEMA EIA Regulations, 2014), Anglo American Inyosi Coal (Pty) Ltd can continue mining with updated EMPr commitments and mitigation measures that take the current status of the opencast mining into account and thus prevent unintentional impacts on the environment and public health and safety. A Part 2 amendment approach will be followed as it refers to a change of scope and the amendments will either result in an increase or a change in nature of the environmental impacts (South Africa, Environmental Impact Assessment Regulations, [2014](#)).

Anglo American Inyosi Coal (Pty) Ltd is committed to ensure compliance with all relevant national and international laws, regulations and standards.

Table 2-1: EMPr Audit Findings² and Proposed Amendments

Audit 2019 findings	Amendment Type
EMPr Amendments	
EMPr Inadequacies Identified by Auditors	
<p>Mis-alignment on the significance of wetland related risks and management measures since the baseline wetland assessment (dated 2005) was conducted. A baseline wetland assessment for Zibulo Colliery OC (Wetland Consulting Services, 2005) was undertaken prior to the operational phase of the opencast activities. This report indicated that the wetlands identified in the study area were already severely modified by agricultural activities prior to the commencement of the opencast mining activities. The wetland baseline studies were conducted prior to the commissioning of the WET-EcoServices, which was developed in 2007. This methodology provides for a scoring system to establish the benefits and services of the wetland ecosystem. A follow-up investigation was conducted by Digby Wells Environment (date unknown). Digby Wells mentioned in their study that the wetlands still have some functionality in terms of flood attenuation and water quality enhancements, and that it should be conserved as far as practically possible. The required mitigation measures for future rehabilitation of the affected wetland are not provided in the EMPr. In addition, the specialist geohydrological report mentioned that no wetlands (or pans) are present within 250m of the strip mine layout and as a result the risks relating to it were not qualified or quantified. Future reviews of the EMPr should reflect the operational and post closure risks, especially when considering dewatering of the open pit and post closure decant scenarios. Subsequent mitigation strategies for addressing the integrity thereof should be considered.</p>	<p>These commitments and impacts were not included within the original EMPr and have now been added to the EMPr amendment. By adding commitments that were not part of the original EMPr, an EIA was conducted. The updated wetland study (Appendix 3) was used for the EIA (Table 7-3) and new commitments proposed from the wetland study and the EIA. The proposed new commitments are given in Table 8-1.</p>
<p>The EMPr, under Section 2.2.11 Water Handling, provides a description of water management with a clear intention of inclusion of pollution control- and evaporation dams for the operation in the EMPr. However, mis-alignment of the description and naming of such facilities with the current onsite Pollution Control Dams, was observed.</p>	<p>This commitment has been aligned/ amended to reflect what is currently on site and the EIA updated accordingly (Table 7-3). Even though the construction of the two PCD's have been completed, the commitment within the EMPr must be amended so that the activities on site and within</p>

² Findings related to the ability of the measures contained in the EMPr to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity (as per Regulation 34 of the EIA Regulations, 2014).

Audit 2019 findings	Amendment Type
	the EMPr are aligned. Table 8-1 thus indicates the new commitment which must replace the original commitment.
Risks relating to Zibulo blasting activities in close proximity to the old defunct Ogies Navigation Colliery crude oil storage facility (stored in bunkers), has not been included in the EMPr. A review of the specialist groundwater report (JMA, 2005) and discussions with mine personnel revealed that the now defunct Ogies Navigation Colliery to the east of Zibulo Colliery OC is actively used for SFF crude oil storage. Crude oil is stored in bunkers and blasting within its vicinity may impact on the integrity thereof resulting in oil contamination of groundwater. Although the risk associated with crude oil storage is not discussed in the EMPr, Zibulo Colliery OC is aware of the risks and has obtained legal advice in respect of its liabilities and risk exposure. It is recommended that the EMPr be updated to reflect the risks and mitigation measures in the EMPr during any future review thereof.	These commitments and impacts were not included within the original EMPr and have now been added to the EMPr amendment. By adding commitments that were not part of the original EMPr, an EIA was conducted. The baseline groundwater- and blasting reports were used for the EIA (Table 7-3) and new commitments proposed from these and the EIA. The proposed new commitments are given in Table 8-1.
Risks and management of general- and hazardous waste are not included in the EMPr. Although Zibulo Colliery OC practices good housekeeping and waste management, as observed during the site observations, the EMPr does not provide for the risks or associated management measures for waste management (i.e. general waste, hazardous waste etc).	These commitments and impacts were not included within the original EMPr and have now been added to the EMPr amendment. By adding commitments that were not part of the original EMPr, an EIA was conducted. Zibulo Colliery's waste management procedures and generally accepted waste management procedures were used for the EIA (Table 7-3) and new commitments proposed from these and the EIA. The proposed new commitments are given in Table 8-1.
EMPr Inadequacy Identified Internally	
The Block/ Infrastructure plan attached to the Opencast EMPs does not show the location of the 9MI and 1MI dams. The Block plan should be updated accordingly as part of the EMPr amendment, and all other activities (that would not trigger additional listed activities) should be included on the Block plan. There also seems to be miss alignment between what is in the Environmental Authorisation and what is on-site. The EA does not make mention of the 9ML and 1ML dams, although some mention was made of a 10MI dam in the EMP (application).	The EMPr, EIA and EA have been updated as to ensure that everything is aligned with each other. No environmental impacts are triggered with this amendment and only the new commitment was given in Table 8-1.
Possible Impractical Commitments Contained in the EMPr that may Require Removal or Rewording	
During steady state mining the usable soil stripped ahead of mining in accordance with the soil stripping map during the dry season will be placed directly on levelled spoils to avoid stockpiling.	This commitment has been amended based on the Zibulo Opencast Rehabilitation Procedure

Audit 2019 findings	Amendment Type
	(AATC016665). The EIA was updated (Table 7-2) and new commitments proposed based on the Rehabilitation Procedure and current practises.
A qualified person will carry out soil sampling to establish lime and fertilizer requirements prior to the start of the rehabilitation process.	This commitment has been amended to align with the recommendations within the baseline pedological assessment. The amended commitment is given in Table 8-1. No EIA was conducted for this amendment.
Electrical Conductivity, pH, TDS, SS, Cl, SO ₄ , Na, F, Fe, Al, Mn, Zn, Total Alkalinity, Ca, Mg, K, Total Hardness will be measured monthly.	This commitment has been amended to align with conditions within the IWUL and the variables that are currently monitored by Zibulo Colliery. The amended commitment is given in Table 8-1. No EIA was conducted for this amendment.
Analyses to 95% charge balance will be undertaken at 6 monthly intervals, including all metals.	This commitment has been removed as it is calculated as part of a quality check. See Table 8-1.
Six monthly monitoring reports must consist of the following: systems audit; efficiency and design; status of monitoring system; data audit and the compliance protocols used; water quality trends and the comparative protocols used; water quality comparison and verification of analytical quality (ion balances); hydrochemical image comparison and variation protocol used; groundwater level data trends and comparative protocols used; upgrading of groundwater monitoring system; conclusions on the monitoring system efficiency; recommendations on gaps/ shortcomings of the current system.	This commitment has been amended as to align it with that of the WUL as well as separate the various reports based on the department they must be sent to and the times of submission. The amended commitments are given in Table 8-1.
An indigenous tree screen will be planted around the mine and infrastructure areas.	This commitment has been removed as it is impractical and was never applied. See Table 8-1.
The revegetation of idle stockpiles and berms.	This commitment has been reworded/ amended to read better and align with what is happening on site. An EIA was conducted (Table 7-3) and additional commitments identified (Table 8-1).
Strict speed control (30km/h) will be implemented and the shortest haul routes will be used.	This commitment has been amended to comply with the Anglo American standards which make use of a speed limit of 40km/h. An increase in speed

Audit 2019 findings	Amendment Type
	required an EIA (Table 7-3) and additional commitments were added (Table 8-1).
When blasting closer than 500m to the R545 or the N12 highway, road closure will be necessary during blasting times to prevent the risk of fly rock injuries to motorists. Road closures will be done in conjunction with the Traffic Authorities.	This commitment has been amended to align with activities on site. See Table 8-1.
Three monthly submissions to relevant authorities of: <ul style="list-style-type: none"> • Surface water monitoring results; • Groundwater monitoring results. 	This commitment has been amended as to align with the IWUL (04/B20G/AGJ/809). Authorities to whom reports must be sent have been added, see Table 8-1.
Annual submissions to relevant authorities: <ul style="list-style-type: none"> • Air quality monitoring for fallout dust; • Noise monitoring; • Updated water balance; • Potential changes in vegetation and fauna; • Revision of the rehabilitation financial provision calculation, with an auditor's report on the amount available in the Trust. 	This commitment has been amended as to align with the IWUL (04/B20G/AGJ/809). Authorities to whom reports must be sent and timeframes have been added, see Table 8-1.
Analyses to 95% charge balance will be undertaken at 6 monthly intervals, including all metals.	This commitment has been removed as it is calculated as part of a quality check. See Table 8-1.

Table 2-2: EA Audit Findings and Proposed Amendments

EA Amendments	
Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this condition includes site preparation. The notice must include a date on which it is anticipated that the activity will commence.	This commitment has been removed as no new construction is planned at Zibulo Colliery, see Table 8-1.
Prior to the removal of the soils for stockpiling additional sampling and analysis of the soils must be undertaken, to determine their suitability for use during rehabilitation.	This commitment has been amended to reflect what is currently taking place and on-site and aligning with Zibulo Colliery's rehabilitation plans.

	This resulted in additional impacts (Table 7-3) and amended commitments (Table 8-1).
Topsoil and subsoil must be sprayed with dust allaying agent immediately after being stockpiled.	This commitment has been amended as dust allaying agents damage soil stockpiles and a new commitment has been proposed in Table 8-1.
Water sprays must be used in the loading of stockpiles.	This commitment has been removed as no sprayers are used on-site. Coal is stockpiled for short periods of time, see Table 8-1.
Consultation and cooperation with local law enforcement agencies must be established to ensure that legal and regulatory compliance on the roads is adhered to.	This commitment has been amended to align with the current practises on-site. See Table 8-1 for the proposed new commitment.
The local municipality and local residents must be pro-actively informed of any road closures and diversions.	This commitment has been removed as it can be combined with a different commitment within the EA, see Table 8-1.
Once the designated areas for waste skips and the planned amounts have been finalized, the mine has to obtain a Section 20 application from the DWAF in terms of the Environmental Conservation Act (Act No. 73 of 1989). Legislation repealed.	This commitment has been removed as this legislation has been repealed and no longer applicable, see Table 8-1.
If spills do occur and soils become contaminated, the appropriate remedial measures must be identified in consultation with appropriate qualified specialists.	This commitment has been amended to align with Zibulo Colliery's SOP's. See Table 8-1.
The expansion project must link with the Integrated Development Plan (IDP) of the eMalahleni Local Municipality especially with regards to the planning processes to ensure adequate water supply and other programmes.	This commitment was removed as no expansion project is planned. See Table 8-1.
The holder of the authorisation must notify the Department, in writing and within 24 (twenty-four) hours, if conditions of this authorisation are not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance.	This commitment has been amended as to provide Zibulo with a practical amount of time to notify the Department of any commitments that are not adhered to (Table 8-1).

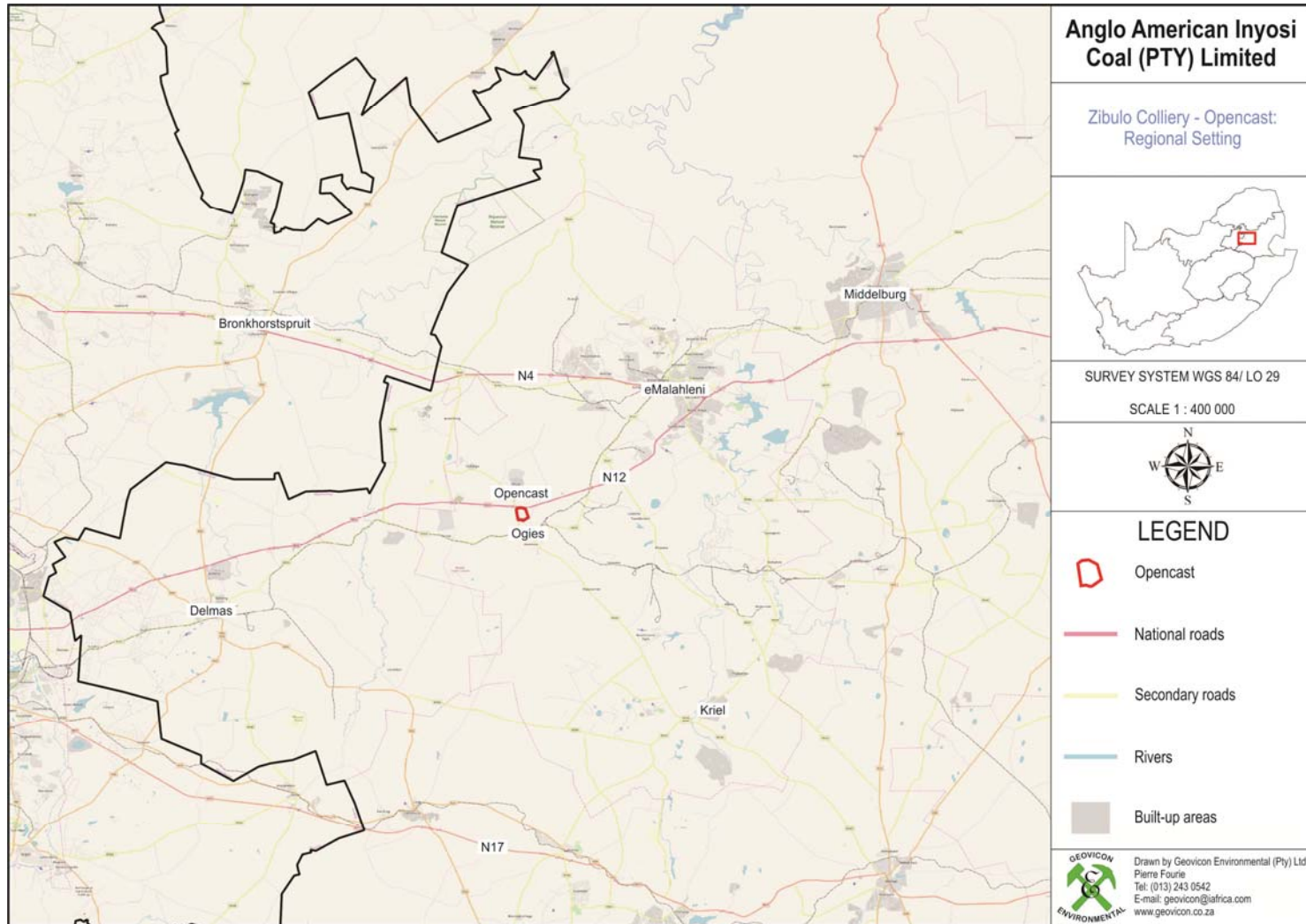


Figure 2-1: Zibulo Colliery – Opencast Regional Setting

SECTION THREE

Advantages and Disadvantages Associated with the Proposed Amendments

3. ADVANTAGES AND DISADVANTAGES ASSOCIATED WITH THE PROPOSED AMENDMENTS

This section of the report will describe the negative and the positive environmental impacts that may occur if the application for amendment is granted, amongst others information on any increases in air emissions, waste generation, discharges to water and impacts of the natural or cultural environment.

3.1 ADVANTAGES ASSOCIATED WITH THE PROPOSED AMENDMENT OF THE EMPr

The following are the advantages of amending the approved EMPr commitments:

- Reduction in the safety risks due to the elimination of the safety hazards.
- Consistency between what is on-site, activities being conducted and the IWUL. This ensures that Zibulo Colliery can control all aspects of the environment and manage all impacts accordingly.
- The impacts on the wetland both during operation and post closure have now been added to the EMPr. This includes the mitigation measures that will protect the current artificial wetland as well as ensure proper rehabilitation of the affected and destroyed (relict) wetlands.
- Continuation of mining with lesser risk to the public and communities around the mine including the land owners and land occupiers on visual, noise, and air quality and biodiversity impacts.

3.2 DISADVANTAGES ASSOCIATED WITH THE PROPOSED AMENDMENT OF THE EMPr

The following are the disadvantages amending the approved EMPr commitments:

Please note that these impacts will be the same, if not less as the current impacts that mining at Zibulo Colliery has. This is because the EMPr amendments do not include any new construction or disturbances than was originally planned.

SECTION FOUR

Policy and Legislative Context

4. POLICY AND LEGISLATIVE CONTEXT

4.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996 (ACT NO. 108 OF 1996)

Section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) states that everyone has the right:

- a) to an environment that is not harmful to their health or well-being; and
- b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that;
 - (i) prevent pollution and ecological degradation;
 - (ii) promote conservation; and
 - (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

In terms of Section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996), everyone has the right to an environment that is not harmful to their health or well-being. In addition, people have the right to have the environment protected, for the benefit of present and future generations, through applicable legislations and other measures that prevent pollution, ecological degradation and promote conservation and secure ecologically sustainable development through the use of natural resources while prompting justifiable economic and social development. The needs of the environment, as well as affected parties, should thus be integrated into the overall project in order to fulfil the requirements of Section 24 of the Constitution. In view of the above, a number of laws pertaining to environmental management were promulgated to give guidance on how the principles set out in section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) would be met. Below are laws applicable to the proposed project that were promulgated to ensure that section 24 of the Constitution of the Republic of South Africa (Act No.108 of 1996) is complied with.

4.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)

Section 24(1) of the NEMA states:

“In order to give effect to the general objectives of integrated environmental management laid down in this Chapter [Chapter 5], the potential consequences for or impacts on the environment of listed activities or specified activities must be considered, investigated, assessed and reported on to the competent authority or the Minister of the Department of Mineral Resources, as the case may be, except in respect of those activities that may commence without having to obtain an environmental authorisation in terms of this Act.”

In order to regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to environmental

impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto, Regulations (EIA Regulations, 2014) were promulgated. These Regulations took effect from the 4th of December 2014.

In addition to the above, Section 28 of the NEMA includes a general "Duty of Care" whereby care must be taken to prevent, control and remedy the effect of significant pollution and environmental degradation. This section stipulates the importance to protect the environment from degradation and pollution irrespective of the operations taking places or activities triggered/ not triggered under No. 327, No. 325 and No. 324.

In view of the above and since no listed activities were triggered by the changes of the Zibulo Colliery's EMPr amendment, no new applications will be required. The amended NEMA EIA Regulations of December 2014 determines requirements to be met in order to obtain an amendment for the mentioned commitments. This report has therefore been compiled in compliance with the above regulations.

4.3 NATIONAL ENVIRONMENTAL MANAGEMENT AIR QUALITY ACT, 2004 (ACT NO. 39 OF 2004)

The National Environmental Management: Air Quality Act (Act No.39 of 2004) (NEM:AQA) focuses on reforming the law regulating air quality in South Africa in order to protect the environment through the provision of reasonable measures protecting the environment against air pollution and ecological degradation and securing ecological sustainable development while promoting justifiable economic and social developments. This Act provides national norms and standards regulating air quality management and control by all spheres of government. These include the National Ambient Air Quality Standards (NAAQS) and the National Dust Control Regulations (NDCR). The standards are defined for different air pollutants with different limits based on the toxicity of the pollutants to the environment and humans, number of allowable exceedances and the date of compliance of the specific standard.

On 22 November 2013 the list of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage was published under GN R893 in Governmental Gazette No 37054, in terms of Section 21(1)(b) of the NEM:AQA.

The proposed amendment will not trigger any of the activities listed under the above-mentioned Regulations, however Anglo American Inyosi Coal (Pty) Ltd: Zibulo Colliery: Opencast Operation must ensure that emissions from their activities complies with the standards as set in the above-mentioned regulations.

4.4 THE NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT NO. 25 OF 1999)

The National Heritage Resources Act (Act No. 25 of 1999) (NHRA) focuses on the protection and management of South Africa's heritage resources. The governing authority for this act is the South African Heritage Resources Agency (SAHRA). In terms of the NHRA, historically important features such as graves, trees, archaeology and fossil beds are protected as well as culturally significant

symbols, spaces and landscapes. Section 38 of the NHRA stipulates the requirements a developer must undertake prior to development. In terms of Section 38 of the NHRA, SAHRA can call for a Heritage Impact Assessment (HIA) where certain categories of development are proposed.

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon.

The Act also makes provision for the assessment of heritage impacts as part of an EIA process and indicates that if such an assessment is deemed adequate, a separate HIA is not required. A Heritage Impact Assessment (HIA) was conducted before the Zibulo Colliery commenced, hence the report has been used to determine whether any heritage resources are located within the area.

4.5 NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004) (NEMBA)

The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) provides for the management and protection of South Africa's biodiversity within the framework established by NEMA. The Act aims to legally provide for biodiversity conservation, sustainable, equitable access and benefit sharing and provides for the management and control of alien and invasive species to prevent or minimize harm to the environment and indigenous biodiversity. The Act imposes obligations on landowners (state or private) governing alien invasive species as well as regulates the introduction of genetically modified organisms. The Act encourages the eradication of alien species that may harm indigenous ecosystems or habitats. The NEMBA ensures that provision is made by the site developer to remove any aliens which have been introduced to the site or are present on the site.

The NEMBA also provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable or protected. The purpose of listing protected ecosystems is primarily to conserve sites of exceptionally high conservation value.

The Act supports South Africa's obligations under sanctioned international agreements regulating international trade in specimens of endangered species, and ensures that the utilization of biodiversity is managed in an ecological sustainable way.

The EMPr Amendment has been compiled to ensure that all applicable requirements prescribed in the NEMBA are complied with.

4.6 MPUMALANGA NATURE CONSERVATION ACT, 1998 (ACT NO. 10 OF 1998)

The Mpumalanga Nature Conservation Act, No. 10 of 1998, aims to consolidate and amend the laws relating to nature conservation within the Province and to provide for matters connected therewith. Provincial legislation relevant to biodiversity conservation comprises of two Provincial Acts, the Mpumalanga Nature Conservation Act (Act 10 of 1998) and the Mpumalanga Tourism and Parks Agency Act (Act 5 of 2005). In relation to nature conservation, the Province has developed the Mpumalanga Biodiversity Sector Plan (MBSP). This plan has been jointly developed by the Mpumalanga Tourism and Parks Agency (MTPA) and the Department of Agriculture, Rural

Development, Land and Environmental Affairs (DARDLEA). The MBSP takes its mandate from the South African Constitution, the National Biodiversity Act (10 of 2004) and the Mpumalanga Nature Conservation Act 10 of 1998. Areas identified under the MBSP as sensitive were identified and where applicable measures will be proposed for ensuring that the areas are not degraded by the proposed project activities.

4.7 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT 28 OF 2002) (MPRDA)

The Department of Mineral Resources and Energy (DMRE) is responsible for regulating the mining and minerals industry to achieve equitable access to the country's resources and contribute to sustainable development. The Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (MPRDA) requires that an EIA be conducted and that the EMP be drafted for the mitigation of impacts identified during the environmental impact assessment for a mining project. During December 2014, the "One Environmental System" was implemented by Government which initiated the streamlining of the licensing processes for mining, environmental authorisations and water use. Under the One Environmental System, The Minister of Mineral Resources, will issue environmental authorisations and waste management licences in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), and the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)(NEMWA), respectively, for mining and related activities. The Minister of Environmental Affairs will be the appeal authority for these authorisations. In view of the above the application for the amendment of the environmental authorisation and the EMPR (proposed EMPR amendments) were submitted to the Department of Mineral Resources and Energy as the competent authority.

4.8 NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998 NWA)

The National Water Act (Act No. 36 of 1998) (NWA) is the primary regulatory legislation, controlling and managing the use of water resources as well as the pollution thereof in South Africa. The NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The NWA presents strategies to facilitate sound management of water resources, provides for the protection of water resources, and regulates use of water by means of Catchment Management Agencies, Water User Associations, Advisory Committees and International Water Management. The National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest. Further, an industry can only be entitled to use water if the use is permissible under the NWA. The enforcing authority on water users is the Department of Water and Sanitation (DWS).

Further, Regulation 704 of the NWA deals with the control and use of water for mining and related activities aimed at the protection of water resources.

No additional application for an integrated water use licence has been submitted to the Department of Water and Sanitation in respect of the amendments made to the EMPR, as no water uses were triggered.

4.9 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008(ACT NO. 59 OF 2008)

The National Environmental Management: Waste Act (NEMWA) requires that all waste management activities must be licensed. According to Section 44 of the NEMWA, the licensing procedure must be integrated with an EIA process in terms of the NEMA.

The objectives of NEMWA involve the protection of health, wellbeing and the environment. The NEMWA provides measures for the minimisation of natural resource consumption, avoiding and minimising the generation of waste, reducing, recycling and recovering waste, and treating and safely disposing of waste.

No waste management activities are triggered by the EMPr amendments, hence no application in terms of the NEMWA was submitted to the Department of Mineral Resources and Energy.

4.10 EIA GUIDELINES

A number of national and provincial EIA guidelines were published by different departments. These guidelines are mainly aimed at assisting relevant stakeholders by providing information and guidance and giving recommendations on a number of aspects relating to the environmental impact assessment process. The guidelines can be used by the competent authority, applicant and the EAP during the EIA process. It is therefore important that the EAP and the person compiling a specialist report must have relevant expertise when conducting the environmental impact assessments.

A number of guidelines were consulted during the compilation of this report and these include amongst them the following i.e. Guidelines on the Need and Desirability, Department of Environmental Affairs and Tourism Integrated Environmental Management Guidelines, Department of Water and Sanitation's Best Practice Guidelines and the Western Cape Provincial Department of Environmental Affairs and Development Planning Guidelines on Public Participation.

SECTION FIVE

Details of the Public Participation Process

5. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED AND RESULTS THEREOF

5.1 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED AND RESULTS THEREOF

Public participation is the cornerstone of any EIA process. The principles of the NEMA govern many aspects of EIA's, including public participation. The general objectives of integrated environmental management laid down in the NEMA include to "ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment". The National Environmental Management Principles include the principle that "The participation of all interested and affected parties in environmental governance must be promoted, and all people must have the opportunity to develop the understanding, skills and capacity necessary to achieve equitable and effective participation, and participation by vulnerable and disadvantaged persons must be ensured", which basically means that the person responsible for the application (EAP) must ensure that provision of sufficient and transparent information on an on-going basis to stakeholders are made to allow them to comment, and to ensure that the participation of previously disadvantaged people like women and the youth are undertaken.

In terms of the EIA Regulations, 2014, when amending an environmental authorisation (Zibulo Colliery approved EMPr), the Environmental Assessment Practitioner managing the application must conduct at least a public participation process where all potential or registered interested and affected parties, including the competent authority, are given a period of at least 30 days to submit comments on the amended EMPr and where applicable the closure plan. In this case the amended EMPr is considered.

This section of the EMPr will give an explanation of the public participation process taken so far in order to comply with the above-mentioned requirements. A number of public participation guidelines were published in a bid to assist persons responsible for the environmental authorisation amendments. As much of the available guidelines were used in determining the public participation process, in guiding the public participation process of the proposed project.

Anglo American Inyosi Coal (Pty) Ltd is applying for an amendment of their environmental authorisation (Approved EMPr and EA) for the Zibulo Colliery – Opencast Operations. The application for the amendment of the environmental authorisation/ EMPr is undertaken in terms of the process as laid out in part 2 of Chapter 5 under the NEMA EIA Regulations, 2014.

The above-mentioned regulations require that an applicant for an amendment of their environmental authorisation submit an amended EMP report to the competent authority after having subjected the reports to a public participation process.

In view of the above, a public participation process will be initiated for the amendment of the environmental authorisation. The public participation process for the proposed project is designed to provide sufficient and accessible information to interested and affected parties (I&APs) in an objective manner to assist them to:

- raise issues of concern and make suggestions for enhanced benefits;
- contribute local knowledge and experience;

- verify that their issues have been captured;
- verify that their issues have been considered in the technical investigations; and
- comment on the findings of the EIA.

The following were conducted in undertaking of the public participation process for the proposed project.

5.1.1 Notification of Potential Interested and Affected Parties

The following methods of notification were used to notify the potential interested and affected parties of the opportunity to register and comment on the draft Amended EMPR during the public participation process for the proposed project:

- On the 14th of August 2020, notices inviting potential interested and affected parties to register and comment on the draft amended EMPr for the proposed changes, were fixed at two sites i.e. at the fence of the property where the proposed project will be undertaken. The notices were compiled to comply with the requirements of Regulation 41(3) of the EIA Regulations, 2014.
- The draft amended EMPr report was submitted to all the commenting authorities for their comments.
- A copy of the draft amended EMPr report was placed at the Zibulo Colliery Opencast offices for the public to peruse and make comments.
- On the 14th of August 2020, notices were posted within the Witbank News which is distributed in and around Ogies, informing the public that the draft amended EMPr report is available for comments at the Zibulo Colliery Opencast offices. The notices were compiled in compliance with the requirements of Regulation 41(3) of the EIA Regulations, 2014.

5.1.2 Registered Interested and Affected Parties

The following are currently registered as interested and affected parties for Zibulo Colliery:

- Department of Mineral Resources and Energy, Mpumalanga Regional Office (Competent Authority),
- Department of Water and Sanitation, Mpumalanga Regional Office (Commenting Authority),
- Department of Agriculture, Rural Development, Land and Environmental Affairs, Mpumalanga Provincial Office (Commenting Authority),
- SANRAL,
- Mpumalanga Tourism and Parks Agency (Commenting Authority),
- South African Heritage Resources Agency (Commenting Authority),
- National Department of Agriculture, Forestry and Fisheries, Mpumalanga Regional Office (Commenting Authority),
- Mpumalanga Tourism and Parks Agency (Commenting Authority),
- eMalahleni Local Municipality,
- Nkangala District Municipality,

- Ward 30 Councillor (eMalahleni Local Municipality), and
- Zibulo Colliery, immediately surrounding land owners and lawful occupiers.

5.1.3 Proof of Consultation

Proof of the above-mentioned consultation and results thereof is attached to this EMPr amendment report. Refer to Appendix 1 for the notice sent to the I&AP's.

5.1.4 Comments, Issues and Responses on the EMPr Amendment Report

All comments and issues received will be recorded and responses to the comments made. The comments and issues raised by the interested and affected parties, their responses and reaction to the response will be presented in the final Amended EMPr by the DMR EMPr template.

SECTION SIX

Baseline Environmental Assessment

6. BASELINE ENVIRONMENTAL ASSESSMENT

6.1 GEOLOGY

Oogiesfontein Opencast reserve falls within the Springs-Witbank coalfield. The lithological profile is comprised of soft overburden, hard overburden, no. 5 coal seam, interburden, no. 4 coal seam, interburden, no. 4L coal seam, interburden, No. 3 coal seam; interburden, no. 2 coal seam, interburden and no.1 coal seam. No. 4L, no. 3 and no. 2 coal seams are the only three continuous seams across the Oogiesfontein opencast reserve. Seams above no. 4L are largely intersected by the limit of weathering. No.5 coal seam can be seen to be intersected by present day topography to the north. Thickness of geological units between the floor of the Karoo sediments and the basement are on average 3.16m. Main coal seams are the no. 2 coal seam (average thickness of 5.7m) and the no. 4L coal seam (average thickness 1.8m). More than 54% of all overburden will be weathered to slightly weathered material. The interburden mainly consists of fine-grained sandstone and sandy mudstone. Topography is fairly flat over the area. No. 5 coal seam is mainly absent. No. 2 and no. 4L coal seams are continuous over the total study area. No. 2 coal seam is situated very close to the basement over the total study area and dips towards the north. The west-east striking Ogies Dyke is situated 420m to the south of the Oogiesfontein opencast reserve. Pyrite is the only sulphide present in the samples. Acid generation potential (AP) is the highest in the carbonaceous rocks and the coal – average AP in carbonaceous rocks is 12.02kg CaCO₃/t and in no. 1, no. 2 and no. 4 coals seams is 32.96kg CaCO₃/t, 20.09kg CaCO₃/t and 12.03kg CaCO₃/t. Neutralisation potential (NP) is highest in coal and lower in sandstone and shales. The Nett Neutralisation Potential (NNP) in carbonaceous rock, no. 2 and no. 4 coal seams all have negative NNP. Sandstone and the no. 1 coal seam have a positive NNP. Carbonaceous clastic rocks together with the no. 2 and no. 4 coal seam samples show high potential for producing acid drainage (SRK, 2009).

6.2 CLIMATE

The opencast area has an average annual precipitation is ± 720mm. Ogies is a summer rainfall area. Average A-pan evaporation is 2.5 times the annual rainfall. Daytime airflow is dominated by northerly winds and easterly to east-south-easterly winds. At night, there is a decrease in the northerly to westerly winds with an increase in winds from the east and east southeast (Figure 1-10). Mean daily temperature is 25.8°C in January and 17.1°C in July. Average daily minimum temperature is 13.2°C in January and 0.2°C in July (SRK, 2009).

6.3 TOPOGRAPHY

Topography of the opencast area is flat to gently undulating between 1520 and 1580 mamsl. The site drains into a tributary of the Saalklapspruit (SRK, 2009).

6.4 SOILS, LAND CAPABILITY AND LAND USE

Eight soils forms were identified including Hutton, Clovelly, Pinedene, Avalon, Bloemdal, Glencoe, Longlands and Katspruit. Average soil depths of Hutton and Clovelly soil forms are between 400 – 1500mm while Pinedene, Bloemdal and Avalon returned depths of between 200-1000mm. Soils derived from the sediments (Ecca Group) are sandy loam to sandy clay in nature varying only slightly in their amounts of iron and magnesium with some variations in the calcium, sodium and potassium levels. More structured and basic derived soils have higher reserves of calcium, magnesium, iron and sodium. They are inherently low in potassium and show lower zinc and potash than is acceptable for economically acceptable agricultural growth. These soils require potassium, phosphorus and Zinc fertiliser. The dominant soils are neutral to slightly acidic. Generally, the cation exchange capacity values in the soils are moderate to low mainly due to the moderately high clay content of the soils. Organic matter content of soils is low. The soil forms can be divided into heavy clay rich soils with poor drainage, light textured (yellow brown and red apedal) soils with well-defined horizons, shallow soils that erode easily and alluvial soils that are weakly stratified. The irrigation potential of the arable soils (Hutton, Clovelly, Griffin, Pinedene and deep Avalon soil forms) is moderate to good. The rest of the soils are generally drainage impaired and good drainage control will be required.

Of the area that was studied, 73.90% is arable land, 11.30% is grazing land, 8.90% is wilderness and 5.8% is classified as a wetland. 97.89% of the area to be affected by mining is cultivated with maize whereas 0.63% of the area to be affected is human settlements and 0.97% of the area to be affected is natural vegetation. 0.51% of the area to be affected consists of pans and dams (SRK, 2009).

6.5 FLORA AND FAUNA

The mining area falls within the Moist Sandy Highveld Grassland and the Moist Cool Highveld Grassland. The study area covers approximately 279ha, 90% of which has been transformed. Cultivated land covers a large proportion of the study area – maize is the principal crop cultivated. These areas have low ecological/ conservational value. 46 species were positively identified. Five currently listed Red Data species could be located in the region. Redgrass *Themeda triandra* dominates entirely and few other species occur particularly *Dicotyledonous forbs*. Forbs are also a common feature of this grassland and include species such as *Berkheya pinnatifida*, *Crabbea acaulis*, *Chaetacanthus costatus*, *Salvia repens*, *Pseudognaphalium luteoalbum* and *Abildgaardia ovata*. Most of the plant taxa present are herbaceous or weakly woody species with the dominant plant forms being grasses, sedges and forbs. Several stands of exotic trees are present in the region.

It is possible that 12 species of threatened birds may potentially occur in the study area however, none of these were observed on the site. These include the Black Stork, Yellow-billed Stork, Greater Flamingo, Lesser Flamingo, Secretary Bird, African Marsh Harrier, Lesser Kestrel, Blue Crane, Wattled Crane, White Bellied Korhaan, Blackwinged Pratincole, and Botha's Lark. Six mammals (mainly rodents), six amphibians (mainly frogs) and two reptiles (snakes) were found to occur in the study area. Most of these species are associated with the wetland habitat. No fish species were recorded during the site visit due to the non-permanent nature of the water. No threatened butterfly species occur in the study area (SRK, 2009).

6.6 SURFACE WATER

The project is located within the Wilge River catchment within the quaternary sub-catchment B20G of the Limpopo-Olifants primary drainage region. The mining area drains to the Saalklapspruit which drains into the Wilge River which is part of the Loskop dam catchment. The Loskop Dam is the receiving water body. The Mean Annual Runoff (MAR) for Loskop dam is $384 \times 10^6 \text{m}^3$. The MAR for the mine area is estimated at $0.11 \times 10^6 \text{m}^3$. The water downstream of the site is used primarily for agriculture and livestock watering purposes. Wetlands occupy 26ha of the study area. The relict wetland is critically modified since there has been a complete loss of natural habitats. These wetlands cannot be regarded as pristine when compared with reference conditions as they have been impacted upon by historical agricultural practices. Red Data Species such as *Nemesia fruticans*, *kniphofla typhoides* ZCodd and *Euornis autumnalis* (Mill.) Chitt. ssp. *clavata* (Baker) Reyneke may occur in the hill slope seepage wetlands (SRK, 2009).

6.7 GROUNDWATER

Aquifers within the Oogiesfontein opencast study area have a moderate to low yielding potential. Only 3 water strikes have been recorded for the 9 newly drilled geohydrological boreholes – only the BSW-4 and BSW-5 can be seen as natural aquifer conditions. BSW-4: A blow yield of 4 l/s was determined for this borehole. BSW-5: estimated yield for this borehole is less than 0.1 l/s. BSW-6: the water strike was recorded at 9m – 11m and a blow yield of 3.2 l/s was determined. From the 7 additional monitoring boreholes, only 3 water strikes were recorded:

- WSW-13: estimated yield of 0.3 l/s at a depth of 21m;
- KGM-B3: associated with a carbonaceous shale layer within the limit of weathering between 10 and 11m;
- KGM-B6: water strike is at 21 – 22m and estimated yields are 0.3 l/s and 0.2 l/s respectively.

Reported yields for the 16 monitoring boreholes ranged between dry and 4 l/s. Only 3 yields could be obtained for the external users' boreholes:

- EUB-6: 1 l/s;
- EUB-17: 2 l/s;
- EUB 105: 0.46 l/s.

The yields for the two, perennial fountains EUF-18 and EUF-33 are estimated at 3.00 l/s and 0.5 l/s respectively. The remaining 7 fountains in the Oogiesfontein opencast survey area are non-perennial and low yielding on during the rainy season. Background groundwater quality is very good and plots as "recent and unpolluted". It is dominated largely by bicarbonate (72%) followed by Cl (15%) and SO_4 (8%), NO_3 (4%) and F (1%). pH values range from 3.4 – 8 and electrical conductivity ranges between 4.7 - 142.0 mS/m. The Total Dissolved Solids indicate total salinity of the groundwater and ranges from 73 – 866 mg/l. Total alkalinity shows values between 5 – 446 mg/l. No widespread agricultural contamination of groundwater is detected – groundwater quality resembles Ca- HCO_3 dominated water. Three different aquifer types occur in the study area namely shallow perched aquifers, shallow weathered zone Karoo aquifers and Deep Karoo aquifers. Groundwater flow in all

three aquifers is essential horizontal. Groundwater flow will follow the surface topographical gradient and estimated groundwater seepage velocity is 0.01 m/day or 3.65 m/year (SRK, 2009).

6.8 AIR QUALITY

Dustfall levels recorded at the five sites were within the Slight to Heavy dust fallout category range. Maximum dust fallout levels were recorded at site 3 during August 2002 (773 mg/m²/day). Slight dust fallout levels were recorded during the months of February, March, April and November 2002. Dust levels during May 2002 increased at all the sites. During the windy months of August and October, dust fallout levels at site 5 fell within the Heavy category. During 2003, dust fallout levels were higher than 2002 on average (SRK, 2009).

6.9 VIBRATION AND NOISE

Present ambient noise levels in the area are lower than suggested in SABS 0103 and there is very little difference between day and night time noise levels. The primary noise source in the area is traffic on the N12, R545 and R555; railway related activities also contribute to ambient noise in the area. Typical ambient noise levels are given as 45 dBA and 35 dBA during the day and night respectively (SABS 0103). There was very little difference between the measured day and night ambient noise levels. Buildings are generally located far from the mining activities and therefore should not suffer any damage from blasting. The OTK silos should be able to withstand the high vibration levels (a limit of 12.7 mm/s should be applied) (SRK, 2009).

6.10 ARCHAEOLOGICAL AND CULTURAL HISTORY

No sites of cultural significance were found in the survey area. No stone tools were noticed and no sites were likely to have been inhabited by Stone Age people in the area. No sites dating to the Iron Age were identified. A few informal cemeteries containing varied numbers of graves were identified. The graves were relocated in accordance with SAHRA on commissioning of the mine. A number of old farmsteads occur in the area however all are in ruin (SRK, 2009).

6.11 SENSITIVE LANDSCAPES

The sensitive landscapes are the wetlands associated with the stream that drain the area. The wetlands associated with the stream are in the north eastern corner of the study area and are not included in the mining or stockpile area. (SRK, 2009)

During 2013, Wetland Consulting Services conducted a Wetland Mitigation Strategy for Zibulo (Appendix 3). The wetlands were delineated during this study and was found to be different than the baseline study. A brief summary is given below and the full report is attached as Appendix 3.

The wetlands within the Zibulo Colliery development site, outside Ogies in Mpumalanga, were assessed by Wetland Consulting Services (WCS) as part of the Wetland Baseline and Impact

Assessment (WCS Report 117, 2004). The results indicated that the wetland to be included in the mining footprint was relict as a result of extensive transformation prior to the initiation of mining activities. Additionally, it did not offer a high level of ecological services to the landscape and was of low ecological importance.

The proposed mining box-cut will remove an already critically modified, relict hillslope seepage wetland. The descriptions of the wetlands and details of the assessments are contained in the text. Wetland functioning had been compromised by activities not associated with mining, and the wetland represents approximately 1.3ha equivalents of functional area. Using the SANBI offset calculator, the following offset targets were determined:

- A wetland functioning offset target of a gain of 1.6 ha-equivalents to ensure no net loss of wetland functional area; and
- A wetland protection target of 10.9 biodiversity ha-equivalents gained and secured.

Applying appropriate time and risk multipliers to the hectare equivalents contained in the candidate wetlands, the following was concluded:

- Rehabilitation of the wetlands on site could potentially generate 5.9ha-eq of wetland functional area;
- Adding the central portion of the 500m buffer to the rehabilitated area may provide approximately 39.7 biodiversity ha-eq to the landscape;
- This will allow much of the remaining agricultural landuse to continue, contributing to food security; and
- The potential ecological gains available within the property should be sufficient to satisfy the required targets.

An on-site offset strategy is recommended, the key objectives being:

- To rehabilitate the eastern valley bottom wetland;
- To rehabilitate the southern hillslope seepage wetland, and possibly direct water from the post-mining landscape into the wetland to create wetter conditions;
- The restoration of the northern hillslope seepage wetland once mining is complete; and
- Possibly to create a wetland around the eastern periphery of the workings.

It is anticipated that the hectare equivalents gained by this initiative will meet the offset target, although provisos are:

- That the mining footprint does not change in the future;
- The assumption holds true that the coal resource in the property to the east of the study site has been exploited, and that the land use in this area, which forms the catchment of the eastern wetland, will remain compatible with maintaining the current hydrological regime;

- That rehabilitation of the mine footprint endeavours to prevent acid mine drainage (AMD) from entering these wetlands. The nutrient loads associated with AMD decant favours the establishment of monospecific stands of *Typha capensis*, potentially compromising the stated objective of improving the biodiversity of the candidate wetlands;

6.12 VISUAL ASPECTS

The N12 to the north and the R545 to the west of the site is considered to be the viewing area carrying the most sensitive visual receptors. The Klipspruit Strip mine is located to the west of the study area and the townships of Ogies and Phola to the south and north respectively. The OTK grain silos directly adjacent to the south of the mining area and the Kendal Power Station directly adjacent to the south-west are prominent landmarks in the area (SRK, 2009).

6.13 REGIONAL SOCIO-ECONOMIC STRUCTURE

Oogiesfontein opencast mine is located in the Mpumalanga province which has one of the fastest growing, fourth largest economies in S.A owing to its natural resources. Severe levels of poverty in the province are evident. The Gross Geographic Product (GGP) of Mpumalanga grew from R9.5 billion in 1970 to R34.3 billion in 1995 and is projected to grow to R89.9 billion in 2020 and contributes 6% to the national GDP. The contribution to the GDP is declining due to shrinkage in mining related activities and energy and exhaustion of coal resources in the province. The main economic sectors in Mpumalanga are energy, mining, manufacturing and community services. Mining and energy in Mpumalanga dominate the sectoral contribution to the GDP and are set to increase due to the increasing demand for power from the countries base load stations. The unemployment rate in Mpumalanga in 1996 was 32.9%. Oogiesfontein opencast mine falls into the eMalahleni District Municipality, which has a GGP of just over R8 million. Mining in the area contributed to more than a quarter of this figure (SRK, 2009).

eMalahleni Demographics:

- Population: 800 people per square km (Phola);
- Population groups: Mainly Africans and Whites;
- 75000 households with 3.7 people in each household;
- Gender distribution: Men = 55%, Women = 45%;
- Age Distribution: 35% (31 – 60 years); 24% (19 – 30 years); 36% (below 18 years);
- Education levels are low – less than a quarter of the population has Grade 12 or higher;
- Employment: Between 55 – 77% employed except for Phola where unemployment is rife at more than 65%;
- Occupational levels: 20% of active labour force is employed in elementary occupations, 20% are employed in craft and trade-related occupations;
- Sectoral employment: 3.8% employed in agriculture; 22% employed in the mining sector;

- Income: Average monthly income is R1400 per month. Phola is the area with the lowest income of less than R400 per month per economically active member;
- 64% of the population of the eMalahleni Local Municipality reside in houses on separate stands. 20% live in informal shacks or dwellings.

eMalahleni Services:

- Transport: Dominant mode of transport is travelling by foot followed by minibus taxis and buses;
- Access to electricity: 70% of households have access to electricity for heat and lighting;
- Water and Sanitation: 80% of households have access to water. In 2001, 70% of households were reported to have a flushing toilet.

6.13.1 Profile of Ogies, Phola and Kendal Area

- Employment: Ogies and Kendal (55% formal employment); Phola township (34%);
- Population: Ogies and Kendal (41% between the ages of 31 and 60, 4% over the age of 61); Phola (24% between the ages of 19 and 30, 29% between the ages of 31 and 60 and 6% over the age of 61);
- Occupational categories: Ogies and Kendal: Semiskilled and skilled (46%), white-collar (9%). Phola: Semi-skilled and skilled (70%), white-collar (2%);
- Household income: Ogies and Kendal: 65% earn over R30000 a year. Phola: 66% earn less than R18000 a year;
- Housing and Infrastructure: Ogies and Kendal (89% live in houses on separate stands, 7% live in informal dwellings or shacks, 3% live elsewhere). Phola (55% live in houses on separate stands, 36% live in informal dwellings or shacks, 6% live in informal dwellings in backyards).

6.13.2 Profile of Affected Businesses

- OTK Silos: The silos date back to 1971. They have a storage capacity of 77 224 tons of maize, divided amongst several bins. The maize is purchased from farmers in the surrounding area. White maize is sold to Pride Milling and yellow maize is transported off site to other companies;
- Pride Milling has a milling capacity of 5800 metric tons per month. White maize is purchased from OTK silos and the product is transported off site between 6am and 8am using the R545 to the N12.

SECTION SEVEN

Environmental Impact Assessment

7. ENVIRONMENTAL IMPACT ASSESSMENT

7.1 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOLLOWED

7.1.1 Approach to Environmental Impact Assessment

The term 'environment' is used in the broadest sense in an Environmental Impact Assessment (EIA). It covers the physical, biological, social, economic, cultural, historical, institutional and political environments.

An EIA is a good planning tool. It identifies the environmental consequences of a proposed project from the beginning and helps to ensure that the project, over its life cycle, will be environmentally acceptable and integrated into the surrounding environment in a sustainable way. The following amendments will have additional impacts on the environment and was assessed in the EIA:

- The impacts upon the wetland system that was not included in the original EMPr. This will be for all of the phases.
- Two PCD's were constructed (9MI and a 1MI instead of a 10MI) instead of a single PCD. The impacts of the original EMPr was compared to that of the PCD's on site and the EIA reassessed. This was be done for the operational and post-closure phases as the construction has already taken place where the original 10MI PCD was planned.
- The impacts that the blasting activities will/ is having on the defunct Ogies Navigation Colliery crude oil storage facility. Only the operational phase was considered as no blasting will take place once mining has been completed.
- Waste management activities was assessed as it was never done for the original EMPr. This was done for the operational and post-closure phases as construction has been completed at the Zibulo Colliery Opencast Operation.
- The stockpiling and stripping of topsoil and subsoil. Only the operational phase was considered.
- The revegetation of idle stockpiles. Only the operational and post-closure phases was considered.
- Strict speed limits (40km/h) will be considered. The speed limit has increased from the original EMPr and this change was taken into account. The operational and post-closure phases will be considered.
- Blasting activities taking place closer than 500m from both the R545 and N12. This was only considered for the operational phase.

7.1.2 Environmental Impact Assessment Process Followed

Under Section 24 of the National Environmental Management Act (NEMA), the Minister promulgated the regulations pertaining to environmental impact assessments (EIA Regulations, 2014) under Government Notice R326 in Government Gazette 38282 of 4 December 2014. These EIA regulations repealed the 2010 EIA regulations and therefore any process relating to environmental authorisations

must be undertaken under the EIA Regulations, 2014. Chapter 4 of the EIA Regulations, 2014 deals with the provisions for application for environmental authorisation.

In view of the above, Anglo American Inyosi Coal (Pty) Limited's Zibulo Colliery – Opencast Operation is obliged to comply with provisions of Chapter 4 for the intended environmental authorisation amendment application for the repositioning of mine infrastructures. Part 2 of chapter 5 under regulation 31 of the EIA Regulations, 2014, contemplate the process to be undertaken for the application for the amendment of the environmental authorisation for the proposed changes (South Africa, Environmental Impact Assessment Regulations, 2014). The process to be followed is described below.

7.1.2.1 Pre-application Consultation with the Competent Authority

In terms of section 24D (1) of the National Environmental Management Act, 1998 (Act 107 of 1998), the Minister responsible for mineral resources is the competent authority for environmental matters relating to mining and associated activities. In view of the above, the application for the amendment of the environmental authorisation for the proposed changes is submitted to the Department of Mineral Resources (DMR), eMalahleni Regional Office for their consideration and decision making.

7.1.2.2 Information Gathering

Environmental baseline data has been obtained, pertaining to surface water, geohydrological data, topographical analyses, soil surveys, vegetation surveys, wetland surveys, social aspects, air quality surveys, noise impact assessment and geological conditions. Weather data was acquired from the South African Weather Service. Historic land use was determined through available data and by visual observations made during various field studies. The data accumulated and analysed is sufficient to gain a baseline indication of the present state of the environment. The use of this baseline study for impact assessments is thus justified and reliable conclusions could be made.

7.2 ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGY

The environment impact/ risk assessment addresses the actions of the amendments of the Anglo American Inyosi Coal (Pty) Ltd's Zibulo Colliery: Opencast Operation and assesses the significance of the impact/ risk on the environment. The impacts and risks will then be described using the parameters specified in the tables below. The impact/ risk on the environment and human health will be determined based on the rated level of significance of the environmental impact/ risk. See Table 7-1 for the criteria used to assess the impacts.

Table 7-1: Criteria used for the environmental impact/ risk assessment

The Status of the Impact		
Positive:	A benefit to the holistic environment.	
Negative:	A cost to the holistic environment.	
Neutral:	No cost or benefit.	
The Probability of the Impact		
Score	Severe/ beneficial effect	Description
0	None	The impact will not occur.
1	Improbable	Less than 15% sure of an impact occurring.
2	Low (probability)	Between 15% and 40% sure of an impact occurring.
3	Medium (probability)	Between 40% and 60% sure that the impact will occur.
4	Highly Probable	Between 60% and 85% sure that the impact will occur.
5	Definite	Over 80% sure that the impact will occur.
The Duration of the Impact		
Score	Severe/ beneficial effect	Description
1	Short term	Less than 2 years.
2	Short to medium term	2-5 years.
3	Medium term	6-25 years.
4	Long term	26-45 years.
5	Permanent	46 years or more.
The Scale of the Impact		
Score	Severe/ beneficial effect	Description
0	None	-
1	Site	Within the site boundary.
2	Local	Affects immediate surrounding areas.
3	Regional	Extends substantially beyond the site boundary but only affects the region or province.
4	National	Affects country.
5	International	Affects is beyond the country and possibly the world.
The Magnitude of the Impact		
Score	Severe/ beneficial effect	Description
2	Minor	Effects observable – environmental impacts reversible with time without human intervention.
4	Low	Effects observable – impacts reversible with rehabilitation.
6	Moderate	Effects observable – affected area restored to acceptable environmental state.
8	High	Extensive effects – irreversible alteration to the environment.
10	Very high/ Don't know	Extensive permanent effects with irreversible alteration.

7.2.1 Significance of Possible Impacts

The significance of the impacts is calculated by multiplying the consequence of the impact by the probability of the impact. Table 7-2 below illustrates the methodology used to calculate the significance of the impact for the proposed project. The significance of the impact is used to categorise the risk to the environment and human health.

Table 7-2: Significance Rating and Risk Category Rating

The Consequences of the Impact		
Consequence = Magnitude + Duration + Scale		
The Significance of the Impact		
Significance = Consequence x Probability		
Significance	Score out of 100	Risk Category
Low	1 to 30	
Medium	30 to 60	
High	60+	

7.2.2 Risk to the Environment

Table 7-3 on the following page lists the possible impacts that the amendments of the Zibulo Colliery: Opencast Operation may have on the direct and surrounding environment. The methodology specified above was used to identify and assess the impacts and then rate the significance of the impact and hence determine the risk of the impact on the environment during the operation and decommissioning of the mine. Mitigation measures have been specified for each impact and must be implemented in order to minimise the risk of the impact.

7.3 RESULTS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

7.3.1 Assessment of Zibulo Colliery's EMPr Amendments Impacts/ Risks

Table 7-3: EMPr and EA Amendments Environmental Impact Assessment

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/ N)	Management and Mitigation Measures
Construction Phase										
No construction phase activities will be considered for the EMPr amendment as construction has been completed at the Zibulo Colliery and no construction forms part of the EMPr amendment.										
Operational Phase										
The operation of the 9MI and 1MI pollution control dams.	Surface water	Flood events and excessive water pumped from the opencast workings will increase the amount of water reporting into the PCD's, resulting in the overflowing of the dams. This excess water may enter the nearby stream, thereby leading to contamination and destruction of the nearby stream.	N	2	2	3	4	18	Y	Proper design, construction, maintenance and monitoring will avoid failure of the said dams. Pollution control dam's water levels must be constantly monitored. Steps and procedures must be put in place to manage situations where excess water builds up in the pollution control dams.
		Water within the pollution control dams will come into contact with fine carbonaceous material. This will result in elevated SO ₄ , Ca, and Mg concentrations in the clean surface water. If this contaminated water is allowed to enter the natural environment it may result in contamination of the surrounding clean water sources. Failure of the said dams will lead to water contamination of the nearby streams.	N	2	2	3	4	18	Y	All pollution control dams will be engineer designed according to specifications required within regulation GN 704, which is to contain the water from a 1:50 year rainfall event with a 0.8m freeboard. These dams will have enough capacity to handle storm events. Water re-use from pollution control dams should be maximised, i.e. dust suppression. Surface water monitoring must be conducted on a monthly basis and the results reported to DWS on a quarterly basis. This will ensure that any impacts that the mine might have on surface water resources will be identified quickly.
	Groundwater	Disposal of dirty water into the two pollution control dams. Water within the pollution control dams will come into contact with fine carbonaceous material. This will result in elevated SO ₄ , Ca, and Mg concentrations. If this contaminated water is allowed to enter the groundwater regime, it will contaminate the groundwater and possible affect downstream users and surface water resources.	N	2	2	3	6	22	Y	Flood prevention must be conducted in terms of the surface water flood risk management plan (Golder, 2015). The PCD's must be lined with composite material (as determined by the civil engineer) to ensure that water does not seep from the dams into the groundwater regime. Measures to monitor whether the dam lining has been compromised must be put in place.
	Fauna	Various animal species may enter the PCD's and get trapped within the water or the slopes of the dams itself. This may lead to death or serious injury.	N	1	2	1	4	7	Y	Groundwater monitoring must be conducted on a quarterly basis and the results reported to DWS on a quarterly basis. This will ensure that any impacts that the mine might have on groundwater resources will be identified. Fences must be constructed around the dams to restrict access to animal species. Daily inspections can be conducted to identify if any fauna species have entered or become trapped within the PCD's. Depending on the animal species, expert animal wranglers must be contacted to remove the animal.
Stripping and stockpiling of topsoil and subsoil.	Topography	The removal of topsoil and subsoil as well as the stockpiling thereof will change the topography of the area.	N	3	2	1	4	21	Y	Topsoil and subsoil must be stockpiled separately to ensure effective rehabilitation of the affected areas. This includes the separate stockpiling of normal and wetland soils. Once topsoil and subsoil has been returned to the opencast, it must be compacted to achieve a similar bulk factor to pre-mining conditions. The rehabilitated area will be sloped to an acceptable condition, based on the
	Soils	Topsoil and subsoil can be lost through wind and water erosion with the loss of the vegetative cover.	N	3	2	2	6	30	Y	
		Soils will be mixed (either normal and wetland soils as well as the topsoil and subsoil) if not stripped and stockpiled	N	3	2	2	6	30	Y	

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/N)	Management and Mitigation Measures
		properly and thus lead to a loss of soil.								closure objectives, to ensure free drainage of water into the local streams.
		Compaction of soils will occur when they are stockpiled. Compaction will lead to erosion and the change of the physical properties of the soil.	N	3	2	2	6	30	Y	Stripping during winter months where possible to maintain structural integrity. Topsoil and subsoil must be stockpiled separately as well as normal soils and wetland soils. This will ensure that soils are readily available for rehabilitation.
	Land capability	The capability of the land will change from the pre-mining state to mining. This means a loss of land capability until mining has been completed and the area rehabilitated.	N	3	2	1	6	27	Y	Soil stockpiles that will remain for longer than 6 months must be vegetated to prevent soil erosion and the leaching of nutrients. Limit the height of soil stockpiles to 5m and rehabilitate as soon as practically possible.
	Land use	The land use will be changed from agriculture to mining which results in a loss of land use until the mine has been rehabilitated.	N	3	2	1	6	27	Y	Construct berms around soil stockpile areas to prevent soil loss through water erosion.
	Air quality	Stripping, stockpiling and the exposure of topsoil and subsoil will lead to an increase in dust generation and a decrease in the surrounding air quality.	N	3	1	2	4	21	Y	Soils must be stripped in accordance to the stripping plan and operators must be informed about the importance of proper soil stripping. Proper stripping and stockpiling of soils will ensure that material is protected and available for rehabilitation which in turn will return the land capability to the planned post-mining land capabilities.
	Surface water	Exposed soil can be transported through wind or water into the surrounding water resources resulting in an increase in silt.	N	2	1	2	2	10	Y	Rehabilitation will be conducted based on the rehabilitation/ closure plan. Proper stripping and stockpiling of soils will ensure that material is protected and available for rehabilitation which in turn will return the land use to the planned post-mining land use.
	Visual	Stripping, stockpiling and the exposure of topsoil and subsoil will lead to an increase in dust generation and a decrease in the local aesthetics.	N	3	2	2	4	24	Y	Stripping and stockpiling must be planned for only a short period of time, preferable before the onset of the dry- and windy seasons. Dust suppression can be conducted to decrease dust generation from construction vehicles. Soil stockpiles that will remain for longer than 6 months must be vegetated to prevent soil erosion and dust generation. Stripping and stockpiling must be planned for only a short period of time, preferable before the onset of the dry- and windy seasons. Soil stockpiles that will remain for longer than 6 months must be vegetated to prevent soil erosion and dust generation. Rehabilitation must be done concurrently to limit the time stockpiles are needed and the area is affected by mining.
Revegetation of idle stockpiles and berms.	Soils	Revegetating berms and stockpiles will decrease the risk of wind and water erosion, compaction and a loss of nutrients.	P					N/A	N	Berms must be revegetated as they will be present for a long period of time. All top soil stockpiles that will be present for longer than 6 months must be revegetated to protect the topsoil from erosion and ensure the availability for rehabilitation. A mix of indigenous grass species must be used for the revegetation of the idle stockpiles and berms. Planting must, as far as possible, be conducted at the end of the cold season to ensure the effective growth of the grass species.
	Land capability and use	By protecting topsoil and subsoil protects these important soils for rehabilitation and thus the final planned land capability and land use.	P					N/A	N	
	Air quality	Dust generation will be decreased to almost nothing as revegetated berms and stockpiles will not be exposed to wind erosion and other dust forming factors.	P					N/A	N	
	Surface- and groundwater	No soil particles will enter either surface and/ or groundwater resources due to the vegetative cover.	P					N/A	N	
	Visual	Visual impacts will be decreased as the green vegetative cover is an aesthetic improvement compared to bare berms	P					N/A	N	

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/N)	Management and Mitigation Measures
		and stockpiles.								
A strict speed limit of 40km/h (as per the Anglo Safety Standard).	Animal life	Vehicles moving on the access/ haul roads can run over various animals crossing these roads.	N	2	2	1	2	10	Y	Signs will be placed along the access/ haul road to indicate the allowable speed limit of 40km/h. Speed limits will also be discussed within induction videos and training sessions. Employees/ visitors must be made aware of the consequences of exceeding the speed limit i.e. removal from site. If the issue persists, large mining vehicles can be electrically limited to 40km/h. The access/ haul roads must be suppressed regularly using water as authorised within the WUL. A dust binding agent can also be used to prevent dust generation from vehicles moving on the access/ haul roads. Berms must be constructed around the roads to prevent vehicles from driving within the surrounding area and decrease the number of animals that may cross the access/ haul roads. If there is a high number of animals being killed on the road, Zibulo Colliery can construct green pathways under the roads to allow the safe movement of animals. The access/ haul road must be graded regularly to ensure a smooth surface for the movement of vehicles and decrease the generation of dust and the consequent soil loss through erosion. Berms located next the long-term areas of the access/ haul road will be vegetated to prevent dust generation. Vehicles must be serviced as required and maintained in a good condition to limit the noise levels generated by their use and movement.
	Soils	Soils will be compacted through the movement of vehicles.	N	4	2	1	6	36	Y	
		Soils will be lost through wind and water erosion as they are exposed on the access/ haul roads.	N	4	2	2	6	40	Y	
		Generation of dust and thus a loss of important soil through the movement of vehicles on the access/ haul roads.	N	3	2	2	6	30	Y	
	Air quality	Movement of vehicles on the access/ haul roads will lead to an increase in dust generation and thus decrease the local air quality.	N	3	2	2	6	30	Y	
	Surface- and groundwater	Dust generated from the movement vehicles can enter into the local water resources and lead to an increase in silt build-up.	N	2	2	2	4	16	Y	
	Noise	The movement of vehicles will increase the noise pollution within the surrounding area.	N	3	2	2	4	24	Y	
	Visual	Dust generated by the movement of vehicles will decrease the aesthetics of the surrounding area.	N	3	2	2	4	24	Y	
When blasting closer than 500m to the R545 or the N12 highway, road closure will be necessary during blasting times to prevent the risk of fly rock injuries to motorists.	Air quality	Dust generated from the blasting activity will decrease visibility on the roads and lead to various motor vehicle accidents.	N	4	1	2	6	36	Y	An effective blasting design must be implemented by a qualified blaster and blasting contractor. Good quality blasting initiation systems will be used as per the required regulations. Road closures must be planned ahead of time and signs placed on the R545 and N12 (depending which falls within the 500m blast radius) indicating the time and date of the next blasting activity. These road closures must be coordinated with the National Toll Concession and the local traffic department. Roads closures will also prohibit pedestrians from entering into the 500m blast radius. No blasting will be conducted under overcast conditions.
		Dust generated from the blasting activity will affect breathing of people caught within it.	N	4	1	2	6	36	Y	
	Noise	Blasting activities will have a short impact on the noise and exceed the noise limits.	N	4	1	2	6	36	Y	
	Vibration	Vibration from the blasting may cause damage to the surrounding roads and infrastructure.	N	4	1	2	6	36	Y	
	Visual	Dust generated from the blasting activities will affect the visual aspects of the area.	N	4	1	2	6	36	Y	
	Socio-economic	Halting the movement of vehicles and people will increase travelling time of the affected people.	N	4	1	2	6	36	Y	
Fly rock can injure or damage any vehicles, infrastructure or people within the 500m radius of the blast.		N	4	1	2	6	36	Y		
Mining (with associated roads and infrastructure) through the derelict wetland.	Wetland	The entire relict wetland will be lost during the course of the opencast mining. The baseline wetland study (Wetland Consulting Services, 2004) indicated that the relict wetland has been severely impacted upon by agriculture and has	N	5	3	2	6	55	Y	Soils are to be stockpiled separately to ensure that wetland soils can be used for the rehabilitation of the wetland area. These stockpiles must be revegetated to protect the soil from wind and water erosion as the wetlands will

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/N)	Management and Mitigation Measures
		lost many of the wetland services that it provides. It still maintains some hydric functions but these will be lost with the opencast mining.								only be rehabilitated during the closure phase.
		Groundwater drawdown from the opencast as well as a decrease of surface- and subsurface water flow will result in a loss of water to the isolated hillslope seepage wetland situated to the north of the opencast.	N	5	3	2	6	55	Y	Berms and trenches will be constructed around the mines extent to prevent contaminated surface water from entering the wetlands. PCD's will be inspected regularly to determine their effectiveness and ensure that no cracks have formed in the lining and allowing water to enter the groundwater regime. Berms can be constructed around stockpiles to prevent contaminated surface runoff from entering the wetlands.
Infrastructure constructed within 500m of the derelict and existing wetlands.		Infrastructure situated within 500m of the wetlands can decrease surface- and subsurface water flow to the wetlands.	N	3	3	2	4	27	Y	The artificial wetland (Wetland Consulting Services, 2017) must be protected for the life of mine as water from the southern hillslope seepage wetland flows through the artificial wetland to the hillslope seepage wetland to the north. This wetland will disappear during rehabilitation but is currently of importance as it ensures the continuous flow of water to other wetlands. Monitoring boreholes can be drilled between the mining operation and wetlands to monitor if the groundwater regime has become contaminated and determine the extent of a pollution plume. Water samples can be taken within the wetlands (downstream of the mining activities) to determine if the mining activities has an impact on the wetlands.
		Contaminated surface water runoff from the access/ haul roads, ROM stockpiles and general mining area can enter the wetlands.	N	3	3	2	4	27	Y	
		Dirty water contained within the PCD's can enter into the wetland either through surface- or groundwater. As all of the PCD's are lined, this will only happen if the dams exceed the operational capacity or damage to the lining allows water to enter into the groundwater.	N	3	3	2	4	27	Y	
		Silted material from the stockpile may enter the wetlands (Wetland Consulting Services, 2004). This will increase the silt levels within the wetland, especially the hillslope seepage wetland situated to the north and the channelled valley bottom wetland situated to the north east.	N	3	3	2	4	27	Y	
Blasting and its impacts to the old defunct Ogies Navigation Colliery crude oil storage facility.	Blasting and vibration (as this facility is not situated within the Zibulo mining right, any other impacts are not considered). It must be noted that there are multiple other mining operations in the area and any one conducting blasting can have an impact on this crude oil storage facility.	Mining activities too close to the crude oil storage facility can compromise the integrity of the berm between the two sections. This can lead to cracks in the porous coal seam or adjacent clastic rocks extending from the Zibulo Colliery Opencast to the Ogies Navigation section. If the cracks connect the two compartments, crude oil will spill to the Zibulo Colliery opencast (JMA, 2005).	N	3	3	3	8	42	Y	A berm of at least 100m should be kept between the Klipspruit and Zibulo mines. Knowledge of the exact location of the Ogies underground perimeter is essential. Plan the Zibulo opencast reserve layout in such a way, that a minimum berm of 100m wide is left between the two sections. Obtain more detailed information from Oil Pollution Control South Africa on the coal floor contour distribution, the volume of crude oil, compartmentalisation, potential position of water barriers, etc. of the Ogies Navigation underground (JMA, 2005). Update the geohydrological study on an annual basis. This study must include the impacts on the crude oil storage facility. Blast induced vibration for all blasting should remain below 75mm/s with and without management controls in place (Rorke, 2005).
The activities related to the mining operation that will generate domestic and hazardous waste. Domestic waste includes, but is not limited to paper, cardboard, plastics, metal,	Surface- and groundwater	Domestic- and hazardous waste may enter into various water sources and contaminate these sources.	N	2	2	2	6	20	Y	Zibulo Colliery will develop a waste management procedure which will address all of the waste streams on site and how waste will be handled and disposed of (Shangoni, 2020). Employees and visitors will be instructed via induction about the waste management procedures at Zibulo Colliery's opencast. Other resources such as posters and shift talks can be used to inform and remind employees and
		Coal product can be blown by the wind or transported via surface water runoff to both surface- and groundwater sources.	N	3	2	2	6	30	Y	

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/	Probability	Duration	Scale	Magnitude	Significance/	Mitigation	Management and Mitigation Measures
			Negative (N)/ Neutral Impact					Risk		
polystyrene, glass, tins and food waste. Hazardous waste includes, but is not limited to hydrocarbons (oil and fuel), various filters removed during maintenance of vehicles, coal product, paint, thinners, contaminated water, human waste, fluorescent tubes and other globes, printer cartridges, tyres and grease.		Contaminated water within the PCD's, trenches and silt traps can overflow into the surface water sources or seep through the lining into the groundwater regime.	N	2	2	2	6	20	Y	visitors about the need for waste management and recycling. Waste disposal bins and skips must be provided by Zibulo Colliery. A certified waste company must be appointed to remove waste and provide proof that the various waste types have been disposed of properly. Domestic waste can be taken to the nearest municipal waste site whereas hazardous material must be taken to a hazardous waste disposal facility such as the Holfontein waste disposal site. Measures can be put into place to recycle domestic and hazardous waste. Involving the local community may provide employment or financial opportunities for poorer members of the community. Coal product can be suppressed with sprayers at the crushing plant and conveyor area to prevent unnecessary dust generation during loading and unloading of coal product stockpiles. Berms, trenches and silt traps are to be constructed around the dirty areas to ensure that dirty water enters the PCD's and clean water is contained and diverted to the clean areas. PCD's, trenches and silt traps must be inspected regularly to ensure their integrity and effectiveness to contain contaminated water and silt (Melchior, 2015). Hydrocarbon spill kits must be provided by the mine, placed at areas where hydrocarbons spills and most likely and clearly marked. Once spill kits have been used and/or filled, they must be removed by the approved waste removal contractor and replaced with new spill kits. Hydrocarbon spills must be cleaned immediately using supplied hydrocarbon spill clean-up kits. These spill kits must be inspected regularly to avoid running out of hydrocarbon spill kits. Maintenance and repairs of vehicles must be conducted at the workshop area. Any breakdowns and repairs that cannot be done at the workshop must be done with drip trays to prevent hydrocarbons from entering the clean environment. Oil traps and containment units will be constructed around the workshop area to contain oil and hydrocarbon spills. These oil containment units will be emptied by the approved waste removal company and disposed of appropriately. Oil drums and fuel tanks must be stored within a bunded wall area that can contain the volume and 10% extra of the oil drums or fuel tanks stored within them. The bunded wall area will be lined so that no oil or fuel spill can escape from it into the clean environment. General housekeeping will be conducted in and around the mining area. The local community can be included in major clean-up projects to spread awareness and opportunities with regards to waste management. Bathrooms, showers and laundries will be inspected to ensure that they are in a good working condition and that no human waste or contaminated water affects the health of the employees, visitors or the environment. Any problems with the infrastructure must be reported immediately and repaired as soon as possible. Any environmental spill or emergency must be handled in terms of the Zibulo
		Runoff from hydrocarbon spills can enter into the surface water resources or seep into the groundwater regime.	N	2	2	2	6	20	Y	
	Soils	Coal product can be blown by the wind or transported via surface water runoff to the soils in and around the mining area.	N	3	2	2	6	30	Y	
		Contaminated water within the PCD's, trenches and silt traps can overflow into the surrounding soils.	N	2	2	2	6	20	Y	
		Hydrocarbon spills from vehicles can enter the soils and contaminate it.	N	2	2	2	6	20	Y	
	Visual	Both domestic- and hazardous waste can enter the clean environment and reduce the aesthetics of the area.	N	2	2	2	6	20	Y	
	Socio-economic	Domestic and hazardous waste that enters the clean environment will contaminate it, whether it is water sources or the areas where people live and affect the health of the people.	N	2	2	2	6	20	Y	
		If bathrooms are not maintained, human waste can breed diseases and affect human health.	N	3	2	2	6	30	Y	
	Wetlands and surrounding landscape	Domestic- and hazardous waste may enter into the surrounding wetland and surrounding environment and contaminate these sources.	N	2	2	2	6	20	Y	
		Coal product can be blown by the wind or transported via surface water runoff to both wetlands and the surrounding environment.	N	3	2	2	6	30	Y	
		Contaminated water within the PCD's, trenches and silt traps can overflow into the wetlands and surrounding clean environment.	N	2	2	2	6	20	Y	
		Runoff from hydrocarbon spills can enter into the wetlands and surrounding clean environment.	N	2	2	2	6	20	Y	

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/ N)	Management and Mitigation Measures
										emergency preparedness plan (Melchior, 2015).
Decommissioning/ Closure- and Post Closure Phase										
The removal and rehabilitation of the 9MI and 1MI pollution control dams.	Surface water	Contaminated water within the PCD's, trenches and silt traps may runoff into the clean environmental and contaminate watercourses and the surrounding environment.	N	3	1	2	4	21	Y	Water within the PCD's must be pumped to the 40MI dam (which will not be rehabilitated) before decommissioning commences to prevent contaminated water from entering the clean environment.
		Dust generated from the construction vehicles may enter the surrounding watercourses and increase the silt within these streams.	N	3	1	2	4	21	Y	Decommissioning must be planned for only a short period of time, preferable before the onset of the dry and windy seasons. Dust suppression can be conducted to decrease dust generation from construction vehicles.
	Groundwater	Contaminated water within the PCD's may seep into the clean groundwater regime and contaminate groundwater and the surrounding environment.	N	2	1	2	6	18	Y	Surface water monitoring must be conducted on a monthly basis and the results reported to DWS on a quarterly basis until such a time that the mine has received a closure certificate from the DMR. This will ensure that any impacts that the mine might have on surface water resources will be identified quickly.
	Air quality	The movement of construction vehicles during the rehabilitation of the PCD's will cause the generation dust fallout and decrease the local air quality.	N	3	1	2	4	21	Y	Groundwater monitoring must be conducted on a quarterly basis and the results reported to DWS on a quarterly basis until such a time that the mine has received a closure certificate from the DMR. This will ensure that any impacts that the mine might have on groundwater resources will be identified.
	Vibration and noise	The removal of the lining of the PCD's and the movement of construction vehicles will increase the noise levels within the local area.	N	3	1	2	4	21	Y	Decommissioning must be planned for only a short period of time, preferable between 06:00 and 18:00. Vehicles must be kept in a good working condition and receive regular maintenance to prevent unnecessary noise levels.
	Visual	The rehabilitation of the PCD's, the generation of dust from the construction vehicles and the disturbance of the area will lead to a decrease of the current aesthetics.	N	2	1	1	4	12	Y	Decommissioning must be planned for only a short period of time. Due to the nature of the surrounding area, this impact is very low and limited mitigation is required as the end product will improve the aesthetics of the area.
A strict speed limit of 40km/h (as per the Anglo Safety Standard) during the decommissioning and closure phases. If any vehicles remain during post-closure these mitigation measures will also apply.	Animal life	Vehicles moving on the access/ haul roads can run over various animals crossing these roads.	N	2	2	1	2	10	Y	Signs will be placed along the access/ haul road to indicate the allowable speed limit of 40km/h. Speed limits will also be discussed within induction videos and training sessions. Employees/ visitors must be made aware of the consequences of exceeding the speed limit i.e. removal from site. If the issue persists, large mining vehicles can be electrically limited to 40km/h.
	Soils	Soils will be compacted through the movement of vehicles.	N	4	2	1	6	36	Y	The access/ haul roads must be suppressed regularly using water as authorised within the WUL. A dust binding agent can also be used to prevent dust generation from vehicles moving on the access/ haul roads. Berms must be constructed around the roads to prevent vehicles from driving within the surrounding area and decrease the number of animals that may cross the access/ haul roads. If there is a high number of animals being killed on the road, Zibulo Colliery can construct green pathways under the roads to allow the safe movement of animals.
		Soils will be lost through wind and water erosion as they are exposed on the access/ haul roads.	N	4	2	2	6	40	Y	
		Generation of dust and thus a loss of important soil through the movement of vehicles on the access/ haul roads.	N	3	2	2	6	30	Y	
	Air quality	Movement of vehicles on the access/ haul roads will lead to an increase in dust generation and thus decrease the local air quality.	N	3	2	2	6	30	Y	The access/ haul road must be graded regularly to ensure a smooth surface for the movement of vehicles and decrease the generation of dust and the consequent soil loss through erosion. Berms located next the long-term areas of the access/ haul road will be vegetated to prevent dust generation.
	Surface- and groundwater	Dust generated from the movement vehicles can enter into the local water resources and lead to an increase in silt build-up.	N	2	2	2	4	16	Y	
	Noise	The movement of vehicles will increase the noise pollution within the surrounding area.	N	3	2	2	4	24	Y	Vehicles must be serviced as required and maintained in a good condition to limit the noise levels generated by their use and movement.
Visual	Dust generated by the movement of vehicles will decrease	N	3	2	2	4	24	Y	Roads used during post-closure can be financially assessed as to tar them for	

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/N)	Management and Mitigation Measures
		the aesthetics of the surrounding area.								long term use.
Rehabilitation and re-establishment of the wetlands.	Wetland	The wetlands that were destroyed and impacted upon will be rehabilitated as planned within the Zibulo Colliery's Wetland Rehabilitation Strategy (Anglo American, 2015) and the Onsite Wetland Mitigation Strategy (Wetland Consulting Services, 2017).	P					N/A	Y	The mitigation measures below will be implemented as to limit the impacts on the wetland.
	Topography	The area will be reshaped to accommodate the wetland rehabilitation plan. This will be aimed at returning the topography to as close as possible to its pre-mining state.	P					N/A	N	The area must be sloped as to be free draining and ensure that the water drains to the wetland.
	Fauna and flora	The re-establishment of the wetlands will allow natural fauna and flora to return to the area. This will improve the biodiversity of the rehabilitated area.	P					N/A	N	Natural vegetation must be used in the rehabilitation process and the assistance of a botanist/ wetland specialist must be acquired during this process. Invasive flora and fauna species must be controlled to prevent an intrusion into the wetland. Care must be taken when removing these species as to prevent further damage (through the use of hazardous substances) to the wetland and natural fauna and flora species. Fire management must be considered as burning a wetland must only occur every 4 to 5 years. Livestock must not be allowed into the wetland area; this can be done by developing a livestock management and movement plan. No poaching/ hunting of any fauna species will be allowed. Signs must be placed on the surrounding fences to inform people hereof.
	Surface- and groundwater	Construction vehicles may spill hydrocarbons into surface water sources during the rehabilitation and re-establishment of the wetlands.	N	3	1	1	4	18	Y	Construction vehicles must be serviced as required (off-site or away from the rehabilitation area) and maintained in a good working condition to prevent hydrocarbons spills. Any hydrocarbon spill must be cleaned immediately using an appropriate oil spill kit (which must be available on-site) and removed by an approved contractor.
		The re-establishment of the wetlands will result in an improved in the quality and quantity of both surface- and groundwater.	P					N/A	N	Water monitoring will continue after rehabilitation to determine any residual impacts on the surface- and groundwater.
	Air quality	Generation of dust from construction vehicles and other construction activities during the re-establishment of the wetlands.	N	3	1	2	4	21	Y	Rehabilitation must be planned for only a short period of time, preferable before the onset of the dry- and windy seasons. Dust suppression can be conducted to decrease dust generation from construction vehicles.
		The revegetation of the wetland area will improve the air quality of the surrounding area.	P					N/A	N	Natural vegetation must be used in the rehabilitation process and the assistance of a botanist/ wetland specialist must be acquired during this process. Invasive flora and fauna species must be controlled to prevent an intrusion into the wetland. Care must be taken when removing these species as to prevent further damage (through the use of hazardous substances) to the wetland and natural fauna and flora species. Fire management must be considered as burning a wetland must only occur every 4 to 5 years.

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/N)	Management and Mitigation Measures
										Livestock must not be allowed into the wetland area; this can be done by developing a livestock management and movement plan. No poaching/ hunting of any fauna species will be allowed. Signs must be placed on the surrounding fences to inform people hereof.
	Noise	Noise will only be generated for a short period of time while the construction and re-establishment of the wetlands are underway. This will coincide with the general rehabilitation of the mine.	N	3	1	2	4	21	Y	Vehicles must be serviced as required and maintained in a good condition to limit the noise levels generated by their use and movement.
	Soils	Construction vehicles may spill hydrocarbons onto the soils during the rehabilitation and re-establishment of the wetlands.	N	3	1	1	4	18	Y	Construction vehicles must be serviced as required (off-site or away from the rehabilitation area) and maintained in a good working condition to prevent hydrocarbons spills. Any hydrocarbon spill must be cleaned immediately using an appropriate oil spill kit (which must be available on-site) and removed by an approved contractor.
		Soils will be returned to as close as possible to their original locations during the re-establishment of the wetland. This will assist with the rehabilitation process and allowing the wetland to function normally.	P					N/A	N	A pedologist must be consulted before and after rehabilitation to assist with the placement of soils as well as the testing of soils after rehabilitation for the purpose of fertiliser requirements.
	Land use and capability	The land use and capability will be returned to a natural state. This is an improvement to the pre-mining state as the wetlands were ploughed and used for agricultural land (thus the formation of the relict wetland).	P					N/A	N	Should the areas around the targeted wetlands be used for agricultural activities, agricultural use of herbicides, pesticides and fertilizers in the vicinity of the wetlands should be carefully controlled to avoid toxic effects on the flora and fauna occurring within the wetlands. A vegetated buffer is recommended between any agricultural lands and wetland areas so as to limit impacts associated with sedimentation and pollutant runoff. The buffer could be expanded where steep slopes occur or where intensive cultivation is undertaken. Cultivation techniques must also employ measures to limit erosion and sediment loss from the cultivated fields, i.e. contour ploughing, etc.
	Visual	Rehabilitating the mining area and the wetlands will improve the aesthetics of the area.	P					N/A	N	Natural vegetation must be used in the rehabilitation process and the assistance of a botanist/ wetland specialist must be acquired during this process. Invasive flora and fauna species must be controlled to prevent an intrusion into the wetland. Care must be taken when removing these species as to prevent further damage (through the use of hazardous substances) to the wetland and natural fauna and flora species. Fire management must be considered as burning a wetland must only occur every 4 to 5 years.
	Socio-economic	The wetland may be impacted upon by agricultural and grazing activities once the rehabilitation has been completed.	N	3	3	2	4	27	Y	Should the areas around the targeted wetlands be used for agricultural activities, agricultural use of herbicides, pesticides and fertilizers in the vicinity of the wetlands should be carefully controlled to avoid toxic effects on the flora and fauna occurring within the wetlands. A vegetated buffer is recommended between any agricultural lands and wetland areas so as to limit impacts associated with sedimentation and pollutant runoff. The buffer could be expanded where steep slopes occur or

Description of Activity	Environmental Aspect	Nature of the Impact (Risk) on the Environment and Human Health	Positive (P)/ Negative (N)/ Neutral Impact	Probability	Duration	Scale	Magnitude	Significance/ Risk	Mitigation Required (Y/N)	Management and Mitigation Measures
										where intensive cultivation is undertaken. Cultivation techniques must also employ measures to limit erosion and sediment loss from the cultivated fields, i.e. contour ploughing, etc.
		Various flora species can be harvested by local communities for use as traditional medicine and thus provide an income to these communities.	P					N/A	Y	Locals must be educated and monitored to ensure that over harvesting does not take place as to decrease the variety of flora species.
<p>The activities related to the rehabilitation and post-closure usage of the mining operation that will generate domestic and hazardous waste.</p> <p>Domestic waste includes, but is not limited to paper, cardboard, plastics, metal, polystyrene, glass, tins and food waste.</p> <p>Hazardous waste includes, but is not limited to hydrocarbons (oil and fuel), various filters removed during maintenance of vehicles, coal product, paint, thinners, contaminated water, human waste, fluorescent tubes and other globes, printer cartridges, tyres and grease.</p>	Surface- and groundwater	Domestic- and hazardous waste may enter into various water sources and contaminate these sources.	N	2	2	2	6	20	Y	<p>Zibulo Colliery will develop a waste management procedure which will address all of the waste streams on site and how waste will be handled and disposed of (Shangoni, 2020).</p> <p>Employees and visitors will be instructed via induction about the waste management procedures at Zibulo Colliery's opencast. Other resources such as posters and shift talks can be used to inform and remind employees and visitors about the need for waste management and recycling.</p> <p>Waste disposal bins and skips must be provided by Zibulo Colliery.</p> <p>A certified waste company must be appointed to remove waste and provide proof that the various waste types have been disposed of properly. Domestic waste can be taken to the nearest municipal waste site whereas hazardous material must be taken to a hazardous waste disposal facility such as the Holfontein waste disposal site.</p> <p>Measures can be put into place to recycle domestic and hazardous waste. Involving the local community may provide employment or financial opportunities for poorer members of the community.</p> <p>Coal product can be suppressed with sprayers at the crushing plant and conveyor area to prevent unnecessary dust generation during loading and unloading of coal product stockpiles.</p> <p>Berms, trenches and silt traps are to be constructed around the dirty areas to ensure that dirty water enters the PCD's and clean water is contained and diverted to the clean areas.</p> <p>PCD's, trenches and silt traps must be inspected regularly to ensure their integrity and effectiveness to contain contaminated water and silt (Melchior, 2015).</p> <p>Hydrocarbon spill kits must be provided by the mine, placed at areas where hydrocarbons spills and most likely and clearly marked. Once spill kits have been used and/or filled, they must be removed by the approved waste removal contractor and replaced with new spill kits.</p> <p>Hydrocarbon spills must be cleaned immediately using supplied hydrocarbon spill clean-up kits. These spill kits must be inspected regularly to avoid running out of hydrocarbon spill kits.</p> <p>Maintenance and repairs of vehicles must be conducted at the workshop area. Any breakdowns and repairs that cannot be done at the workshop must be done with drip trays to prevent hydrocarbons from entering the clean environment.</p> <p>Oil traps and containment units will be constructed around the workshop area to contain oil and hydrocarbon spills. These oil containment units will be emptied by the approved waste removal company and disposed of appropriately.</p>
		Coal product can be blown by the wind or transported via surface water runoff to both surface- and groundwater sources.	N	3	2	2	6	30	Y	
		Contaminated water within the PCD's, trenches and silt traps can overflow into the surface water sources or seep through the lining into the groundwater regime.	N	2	2	2	6	20	Y	
		Runoff from hydrocarbon spills can enter into the surface water resources or seep into the groundwater regime.	N	2	2	2	6	20	Y	
	Soils	Coal product can be blown by the wind or transported via surface water runoff to the soils in and around the mining area.	N	3	2	2	6	30	Y	
		Contaminated water within the PCD's, trenches and silt traps can overflow into the surrounding soils.	N	2	2	2	6	20	Y	
		Hydrocarbon spills from vehicles can enter the soils and contaminate it.	N	2	2	2	6	20	Y	
	Visual	Both domestic- and hazardous waste can enter the clean environment and reduce the aesthetics of the area.	N	2	2	2	6	20	Y	
	Socio-economic	Domestic and hazardous waste that enters the clean environment will contaminate it, whether it is water sources or the areas where people live and affect the health of the people.	N	2	2	2	6	20	Y	
		If bathrooms are not maintained, human waste can breed diseases and affect human health.	N	3	2	2	6	30	Y	
	Wetlands and surrounding landscape	Domestic- and hazardous waste may enter into the surrounding wetland and surrounding environment and contaminate these sources.	N	2	2	2	6	20	Y	
		Coal product can be blown by the wind or transported via surface water runoff to both wetlands and the surrounding environment.	N	3	2	2	6	30	Y	
		Contaminated water within the PCD's, trenches and silt traps can overflow into the wetlands and surrounding clean	N	2	2	2	6	20	Y	

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		environment. Runoff from hydrocarbon spills can enter into the wetlands and surrounding clean environment.	N	2	2	2	6	20	Y	<p>Oil drums and fuel tanks must be stored within a bunded wall area that can contain the volume and 10% extra of the oil drums or fuel tanks stored within them. The bunded wall area will be lined so that no oil or fuel spill can escape from it into the clean environment.</p> <p>General housekeeping will be conducted in and around the mining area.</p> <p>The local community can be included in major clean-up projects to spread awareness and opportunities with regards to waste management.</p> <p>Bathrooms, showers and laundries will be inspected to ensure that they are in a good working condition and that no human waste or contaminated water affects the health of the employees, visitors or the environment. Any problems with the infrastructure must be reported immediately and repaired as soon as possible.</p> <p>Any environmental spill or emergency must be handled in terms of the Zibulo emergency preparedness plan (Melchior, 2015).</p>

SECTION EIGHT

**Environmental Management Programme
Amendments and Reasons for Amendments**

8. ENVIRONMENTAL MANAGEMENT PROGRAMME AMENDMENTS

8.1 REASONS FOR THE AMENDMENT OF THE ZIBULO COLLIERY (OC) EMPr

Anglo American Inyosi Coal (Pty) Ltd conducts yearly external environmental to ensure compliance with the commitments within the approved EMPr and EAs. During the 2019 external environmental the inadequacies in terms of Regulation 34 of the EIA Regulations, 2014 (see **Error! Reference source not found.**) were identified and it was recommended that the relevant sections/ impacts/ commitments (within the approved EMPr) be updated, removed, amended or reworded (Shangoni, 2019). By amending the NEMA EA and the approved Zibulo Colliery's EMPr (Part 2 amendment, as per the NEMA EIA Regulations, 2014), Anglo American Inyosi Coal (Pty) Ltd can continue mining with updated EMPr commitments and mitigation measures that take the current status of the opencast mining into account and thus prevent unintentional impacts on the environment and public health and safety. A Part 2 amendment approach will be followed as it refers to a change of scope and the amendments will either result in an increase or a change in nature of the environmental impacts (South Africa, Environmental Impact Assessment Regulations, 2014).

Anglo American Inyosi Coal (Pty) Ltd is committed to ensure compliance with all relevant national and international laws, regulations and standards.

8.2 EMPr AMENDMENT TABLE

Table 8-1 below indicates the original EMPr commitments as per the approved EMPr. The table also shows the proposed amended EMPr commitments based on the reasons for amendment. These proposed new commitments take into account what is currently happening at the Zibulo Colliery Opencast as well as the removal of those commitments that have not taken place or seen as null and void. New proposed commitments have also been added that were not considered within the original EMPr. These new proposed commitments include the impacts on the wetlands, the impact that blasting might have on the storage of crude oil within the defunct Ogies Navigation Colliery that is situated to the east of Zibulo Colliery and management measures for waste management.

Table 8-1: EMPr and EA Amendments

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
EMPr Amendments				
Construction Phase				
Activity: Water Handling				
Construction of surface infrastructure.	Surface water	Construct a 10MI pollution control facility for storage of dirty water which can be re-used for dust suppression prior to exposing carbonaceous material.	Construction of two, lined PCD's (9MI and 1MI, respectively) which will contain all of the contaminated surface runoff and water pumped from the opencast pit. Water from within these PCD's will be used for dust suppression. These dams must be constructed according to the approved engineering designs. Appendix 2 indicates the updated Block Plan which indicates the two PCD's.	Amendment: Two PCD's have been constructed to manage the contaminated surface runoff and water removed from the pits to continue mining.
		Construct water management berms with evaporation ponds at the base of the spoils and prior to opening of the boxcut.	N/A	Deletion: This commitment was removed as no evaporation ponds have been constructed. All contaminated surface runoff is channelled to the existing PCD's.
Operational Phase				
Activity: Strip Mining				
Mining through the relict wetland and the impact mining related activities on the wetlands.	Wetland and sensitive landscapes	N/A	Soils are to be stockpiled separately to ensure that wetland soils can be used for the rehabilitation of the wetland area. These stockpiles must be revegetated to protect the soil from wind and water erosion as the wetlands will only be rehabilitated during the closure phase.	Addition: These are new commitments that were not part of the approved EMPr. These new commitments have been obtained from the wetland studies (Appendix 3 and Appendix 4).
			Berms and trenches will be constructed around the mines extent to prevent contaminated surface water from entering the wetlands.	
			PCD's will be inspected regularly to determine their effectiveness and ensure that no cracks have formed in the lining and allowing water to enter the groundwater regime.	
			The artificial wetland (Wetland Consulting Services, 2017) must be protected for the life of mine as water from the southern hillslope seepage wetland flows through the artificial wetland to the hillslope seepage wetland to the north. This wetland will disappear during rehabilitation but is currently of importance as it ensures the continuous flow of water to other wetlands.	
			Monitoring boreholes can be drilled between the mining operation and wetlands to monitor if the groundwater regime has become contaminated and determine the extent of a pollution plume.	
			Water samples can be taken within the wetlands (downstream of the mining activities) to determine if the mining activities has an impact on the wetlands.	
			Soils are to be stockpiled separately to ensure that wetland soils can be used for the rehabilitation of the wetland area. These stockpiles must be revegetated to protect the soil from wind and water erosion as the wetlands will only be rehabilitated during the closure phase.	
			The wetland assessment will be updated before the end of 2021 and then be updated every 5 years or as needed.	
The activities related to the	Surface- and	N/A	Waste disposal bins and skips must be clearly marked as to indicate domestic waste and	Addition: These are new commitments that were not

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
<p>mining operation that will generate domestic and hazardous waste.</p> <p>Domestic waste includes, but is not limited to paper, cardboard, plastics, metal, polystyrene, glass, tins and food waste.</p> <p>Hazardous waste includes, but is not limited to hydrocarbons (oil and fuel), various filters removed during maintenance of vehicles, coal product, paint, thinners, contaminated water, human waste, fluorescent tubes and other globes, printer cartridges, tyres and grease.</p>	groundwater		hazardous waste (Shangoni, 2020). It is important to separate waste for proper disposal.	part of the approved EMPr.
	Soils		Zibulo Colliery will develop a waste management procedure which will address all of the waste streams on site and how waste will be handled and disposed of.	
	Employees and visitors will be instructed via induction about the waste management procedures at Zibulo Colliery's opencast. Other resources such as posters and shift talks can be used to inform and remind employees and visitors about the need for waste management and recycling.			
	Waste disposal bins and skips will be provided on-site for waste disposal.			
	A certified and respected waste company must be appointed to remove waste and provide proof that the various waste types have been disposed of properly. Domestic waste can be taken to the nearest municipal waste site whereas hazardous material must be taken to a hazardous waste disposal facility such as the Holfontein waste disposal site.			
	Measures can be put into place to recycle domestic and hazardous waste. Involving the local community may provide employment or financial opportunities for poorer members of the community.			
	Coal product can be suppressed with sprayers at the crushing plant and conveyor area to prevent unnecessary dust generation during loading and unloading of coal product stockpiles.			
	Berms, trenches and silt traps are to be constructed around the dirty areas to ensure that dirty water enters the PCD's and clean water is contained and diverted to the clean areas.			
	PCD's, trenches and silt traps must be inspected regularly to ensure their integrity and effectiveness to contain contaminated water and silt (Melchior, 2015).			
	Hydrocarbon spill kits must be provided by the mine, placed at areas where hydrocarbons spills and most likely and clearly marked. Once spill kits have been used and/or filled, they must be removed by the approved waste removal contractor and replaced with new spill kits.			
	Hydrocarbon spills must be cleaned immediately using supplied hydrocarbon spill clean-up kits. These spill kits must be inspected regularly to avoid running out of hydrocarbon spill kits.			
	Maintenance and repairs of vehicles must be conducted at the workshop area. Any breakdowns and repairs that cannot be done at the workshop must be done with drip trays to prevent hydrocarbons from entering the clean environment.			
	Oil traps and containment units will be constructed around the workshop area to contain oil and hydrocarbon spills. These oil containment units will be emptied by the approved waste removal company and disposed of appropriately.			
	Visual		Oil drums and fuel tanks must be stored within a bunded wall area that can contain the volume and 10% extra of the oil drums or fuel tanks stored within them. The bunded wall area will be lined so that no oil or fuel spill can escape from it into the clean environment.	
Socio-economic	General housekeeping will be conducted in and around the mining area.			
Wetlands and surrounding landscape	The local community can be included in major clean-up projects to spread awareness and opportunities with regards to waste management.			
Bathrooms, showers and laundries will be inspected to ensure that they are in a good working condition and that no human waste or contaminated water affects the health of				

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
			the employees, visitors or the environment. Any problems with the infrastructure must be reported immediately and repaired as soon as possible. Any environmental spill or emergency must be handled in terms of the Zibulo emergency preparedness plan (Melchior, 2015).	
Ongoing rehabilitation during the mining process.	Soils impact, land capability.	During steady state mining the usable soil stripped ahead of mining in accordance with the soil stripping map (Figure 2-2) during the dry season will be placed directly on levelled spoils to avoid stockpiling.	Topsoil and subsoil will be stripped separately with topsoil stripping occurring to a depth of 1.5m in all areas. Topsoil stripping will be conducted in both the wet and dry seasons. However, top-soiling will be limited as the disturbed areas may be utilised for the stockpiling of topsoil and overburden from the opencast with all topsoil currently being stockpiled.	Amendment: This commitment was amended to align with the Zibulo Opencast Rehabilitation Procedure (AATC016665). The Zibulo Opencast is a mini pit and faces space constraints, it is thus very difficult for soils to be placed on levelled spoils as this space can be used for other stockpiles.
		A qualified person will carry out soil sampling to establish lime and fertilizer requirements prior to the start of the rehabilitation process.	Soil analysis will be undertaken by a qualified person as and when required to determine the fertility of the soil, should revegetation and the propagation thereof not achieve the required basal cover (GCS, 2005). A report hereof will be made available on request. Further, fertiliser will also be applied during the seeding process.	Amendment: This commitment was reworded to be operation specific and align with the recommendations within the specialist studies.
Surface water management.	Surface water impacts.	Electrical Conductivity, pH, TDS, SS, Cl, SO ₄ , Na, F, Fe, Al, Mn, Zn, Total Alkalinity, Ca, Mg, K, Total Hardness will be measured monthly.	Electrical conductivity (EC), pH, total dissolved solids (TDS), suspended solids (SS), chloride (Cl), sulphates (SO ₄), nitrates (NO ₃), sodium (Na), fluoride (F), iron (Fe), aluminium (Al), manganese (Mn), zinc (Zn), total alkalinity, calcium (Ca), magnesium (Mg) and potassium (K) will be measured on a monthly basis. Total petroleum hydrocarbons (TPH) will only be analysed when a hydrocarbon spill occurs.	Amendment: These variables are currently measured but do not align with the variables stipulated within the IWUL. The new commitment includes all of the variables from the IWUL as well as variables that are currently monitored by Zibulo Colliery.
		Analyses to 95% charge balance will be undertaken at 6 monthly intervals, including all metals.	N/A	Deletion: The charge balance is already calculated as part of a quality check. This does not need to be analysed separately. Metals to be tested are required as per the IWUL and include within the abovementioned commitment.
Groundwater management (under various activities).	Groundwater impacts.	Six monthly monitoring reports must consist of the following: Systems audit; efficiency and design; status of monitoring system; data audit and the compliance protocols used; water quality trends and the comparative protocols used; water quality comparison and verification of analytical quality (ion balances); hydrochemical image comparison and variation protocol used; groundwater level data trends and comparative protocols used; upgrading of groundwater monitoring system; conclusions on the monitoring system efficiency; recommendations on gaps/ shortcomings of the current system.	Surface- and groundwater monitoring reports will be submitted to the DWS on a quarterly basis. An annual surface- and groundwater monitoring report will also be submitted to the DWS. Zibulo Colliery will conduct an annual internal ISO and systems audits which will determine the effectiveness of the surface- and groundwater monitoring regime. The geohydrological model will be updated on an annual basis to assist with the determination of the effectiveness of the surface- and groundwater monitoring regime.	Amendment: This commitment was amended as to align it with that of the WUL as well as separate the various reports based on the department they must be sent to and the times of submission.
Stockpiling of overburden.	Visual impacts.	An indigenous tree screen will be planted around the mine and infrastructure area.	N/A	Deletion: This commitment is impractical and was never properly implemented.
Truck and shovel operations (under various commitments).	Air quality.	The revegetation of idle stockpiles and berms.	Berms must be revegetated as they will be present for a long period of time. All topsoil stockpiles that will be present for longer than 6 months must be revegetated to protect the topsoil from erosion and ensure the availability for rehabilitation.	Amended: This commitment was amended and reworded to reflect what is happening on site and what is most practical for Zibulo Colliery.
		Strict speed control (30 km/hr) will be implemented and the shortest haul routes will be used.	A strict speed limit of 40km/h (as per the Anglo Safety Standard) will be enforced through various road signs, speed humps, inductions and notices. All haul roads will be designed	Amended: This commitment was reworded as to make auditable and align it with what is currently

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
			as short as possible to decrease travelling time and distance.	taking place at site.
A strict speed limit of 40km/h (as per the Anglo Safety Standard).	Animal life	Strict speed control (30 km/hr) will be implemented and the shortest haul routes will be used.	Signs will be placed along the access/ haul road to indicate the allowable speed limit of 40km/h. Speed limits will also be discussed within induction videos and training sessions. Employees/ visitors must be made aware of the consequences of exceeding the speed limit i.e. removal from site. If the issue persists, large mining vehicles can be electrically limited to 40km/h.	Addition: Although a speed limit is discussed within the original EMPr of 30km/h, the actual speed limit on-site at all Anglo Coal sites is 40km/h. This is in line with the internal Anglo American Standards. New commitments were added to accommodate this increase.
	Soils		The access/ haul roads must be suppressed regularly using water as authorised within the WUL. A dust binding agent can also be used to prevent dust generation from vehicles moving on the access/ haul roads.	
	Air quality		Berms must be constructed around the roads to prevent vehicles from driving within the surrounding area and decrease the number of animals that may cross the access/ haul roads. If there is a high number of animals being killed on the road, Zibulo Colliery can construct green pathways under the roads to allow the safe movement of animals.	
	Surface- and groundwater		The access/ haul road must be graded regularly to ensure a smooth surface for the movement of vehicles and decrease the generation of dust and the consequent soil loss through erosion.	
	Noise		Berms located next the long-term areas of the access/ haul road will be vegetated to prevent dust generation.	
	Visual		Vehicles must be serviced as required and maintained in a good condition to limit the noise levels generated by their use and movement.	
Blasting.	Vibration and noise.	When blasting closer than 500m to the R545 or the N12 highway, road closure will be necessary during blasting times to prevent the risk of fly rock injuries to motorists. Road closures will be done in conjunction with the Traffic Authorities.	When blasting closer than 500m to the R545 or the N12 highway, road closure will be necessary during blasting times to prevent the risk of fly rock injuries to motorists. Road closures will be done in conjunction with the Traffic Authorities.	Amended: This commitment was amended by aligning it with what is currently taking place at Zibulo Colliery.
Activity: Drilling and Blasting				
Blasting and its impacts to the old defunct Ogies Navigation Colliery crude oil storage facility.	Mining activities too close to the crude oil storage facility can compromise the integrity of the berm between the two sections. This can lead to cracks in the porous coal seam or adjacent clastic rocks extending from the Zibulo Colliery Opencast to the Ogies Navigation section. If the cracks connect the two compartments, crude oil will spill to the Zibulo Colliery opencast (JMA,	N/A	<p>A berm of at least 100m should be kept between the Klipspruit and Zibulo mines.</p> <p>Knowledge of the exact location of the Ogies underground perimeter is essential.</p> <p>Plan the Zibulo opencast reserve layout in such a way, that a minimum berm of 100m wide is left between the two sections.</p> <p>Obtain more detailed information from Oil Pollution Control South Africa on the coal floor contour distribution, the volume of crude oil, compartmentalisation, potential position of water barriers, etc. of the Ogies Navigation underground (JMA, 2005).</p> <p>Update the geohydrological study on an annual basis. This study must include the impacts on the crude oil storage facility.</p> <p>Blast induced vibration for all blasting should remain below 75mm/s with and without management controls in place (Rorke, 2005).</p>	Addition: These are new commitments that were not part of the approved EMPr.

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
	2005).			
Activity: Water Handling				
The operation of the 9MI and 1MI pollution control dams.	Surface water	N/A	Proper design, construction, maintenance and monitoring will avoid failure of the said dams.	Addition: These are new commitments that were not part of the approved EMPr. Although the EMPr does mention the 40MI and the 10MI PCD this is not what is present on site. The 10MI PCD was split into a 9MI PCD and a 1MI PCD.
	Pollution control dam's water levels must be constantly monitored. Steps and procedures must be put in place to manage situations where excess water builds up in the pollution control dams.			
	All pollution control dams will be engineer designed according to specifications required within regulation GN 704, which is to contain the water from a 1:50 year rainfall event with a 0.8m freeboard. These dams will have enough capacity to handle storm events.			
	Water re-use from pollution control dams should be maximised, i.e. dust suppression.			
	Surface water monitoring must be conducted on a monthly basis and the results reported to DWS on a quarterly basis. This will ensure that any impacts that the mine might have on surface water resources will be identified quickly.			
	Flood prevention must be conducted in terms of the surface water flood risk management plan (Golder, 2015).			
	Groundwater		The PCD's must be lined with composite material (as determined by the civil engineer) to ensure that water does not seep from the dams into the groundwater regime. Measures to monitor whether the dam lining has been compromised must be put in place.	
	Groundwater monitoring must be conducted on a quarterly basis and the results reported to DWS on a quarterly basis. This will ensure that any impacts that the mine might have on groundwater resources will be identified.			
	Fauna		Fences must be constructed around the dams to restrict access to animal species.	
Daily inspections can be conducted to identify if any fauna species have entered or become trapped within the PCD's. Depending on the animal species, expert animal wranglers must be contacted to remove the animal.				
The block plan will be update regularly or as needed to include any and all changes within the mining right area.				
Decommissioning and Closure				
Activity: Rehabilitation of the Wetlands				
Rehabilitation and re-establishment of the wetlands.	Wetland	N/A	The area must be sloped as to be free draining and ensure that the water drains to the wetland.	Addition: These are new commitments that were not part of the approved EMPr.
			Natural vegetation must be used in the rehabilitation process and the assistance of a botanist/ wetland specialist must be acquired during this process.	
			Invasive flora and fauna species must be controlled to prevent an intrusion into the	

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
			wetland. Care must be taken when removing these species as to prevent further damage (through the use of hazardous substances) to the wetland and natural fauna and flora species.	
			Fire management must be considered as burning a wetland must only occur every 4 to 5 years.	
			Locals must be educated and monitored to ensure that over harvesting does not take place as to decrease the variety of flora species.	
	Topography		Cultivation techniques must also employ measures to limit erosion and sediment loss from the cultivated fields, i.e. contour ploughing, etc.	
	A vegetated buffer is recommended between any agricultural lands and wetland areas so as to limit impacts associated with sedimentation and pollutant runoff. This could be expanded where steep slopes occur or where intensive cultivation is undertaken.			
	Should the areas around the targeted wetlands be used for agricultural activities, agricultural use of herbicides, pesticides and fertilizers in the vicinity of the wetlands should be carefully controlled to avoid toxic effects on the flora and fauna occurring within the wetlands.			
	Fauna and flora		Natural vegetation must be used in the rehabilitation process and the assistance of a botanist/ wetland specialist must be acquired during this process.	
	A pedologist must be consulted before and after rehabilitation to assist with the placement of soils as well as the testing of soils after rehabilitation for the purpose of fertiliser requirements.			
	Any hydrocarbon spill must be cleaned immediately using an appropriate oil spill kit (which must be available on-site) and removed by an approved contractor.			
	Construction vehicles must be serviced as required (off-site or away from the rehabilitation area) and maintained in a good working condition to prevent hydrocarbons spills.			
	Surface- and groundwater		Vehicles must be serviced as required and maintained in a good condition to limit the noise levels generated by their use and movement.	
	No poaching/ hunting of any fauna species will be allowed. Signs must be placed on the surrounding fences to inform people hereof.			
	Livestock must not be allowed into the wetland area; this can be done by developing a livestock management and movement plan.			
	Rehabilitation must be planned for only a short period of time, preferable before the onset of the dry- and windy seasons. Dust suppression can be conducted to decrease dust generation from construction vehicles.			
	Air quality		Water monitoring will continue after rehabilitation to determine any residual impacts on	

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
	Noise Soils Land use and capability Visual Socio-economic		the surface- and groundwater. Any hydrocarbon spill must be cleaned immediately using an appropriate oil spill kit (which must be available on-site) and removed by an approved contractor.	
Activity: Waste Management				
The activities related to the rehabilitation and post-closure usage of the mining operation that will generate domestic and hazardous waste. Domestic waste includes, but is not limited to paper, cardboard, plastics, metal, polystyrene, glass, tins and food waste. Hazardous waste includes, but is not limited to hydrocarbons (oil and fuel), various filters removed during maintenance of vehicles, coal product, paint, thinners, contaminated water, human waste, fluorescent tubes and other globes, printer cartridges, tyres and grease.	Surface- and groundwater Soils Visual	N/A	Waste disposal bins and skips must be clearly marked as to indicate domestic waste and hazardous waste (Shangoni, 2020). It is important to separate waste for proper disposal. Zibulo Colliery will develop a waste management procedure which will address all of the waste streams on site and how waste will be handled and disposed of. Employees and visitors will be instructed via induction about the waste management procedures at Zibulo Colliery's opencast. Other resources such as posters and shift talks can be used to inform and remind employees and visitors about the need for waste management and recycling. Waste disposal bins and skips will be provided on-site for waste disposal. A certified and respected waste company must be appointed to remove waste and provide proof that the various waste types have been disposed of properly. Domestic waste can be taken to the nearest municipal waste site whereas hazardous material must be taken to a hazardous waste disposal facility such as the Holfontein waste disposal site. Measures can be put into place to recycle domestic and hazardous waste. Involving the local community may provide employment or financial opportunities for poorer members of the community. Coal product can be suppressed with sprayers at the crushing plant and conveyor area to prevent unnecessary dust generation during loading and unloading of coal product stockpiles. Berms, trenches and silt traps are to be constructed around the dirty areas to ensure that dirty water enters the PCD's and clean water is contained and diverted to the clean areas. PCD's, trenches and silt traps must be inspected regularly to ensure their integrity and effectiveness to contain contaminated water and silt (Melchior, 2015).	Addition: These are new conditions that were not part of the approved EMPr.

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
	<p>Socio-economic</p> <p>Wetlands and surrounding landscape</p>		<p>Hydrocarbon spill kits must be provided by the mine, placed at areas where hydrocarbons spills and most likely and clearly marked. Once spill kits have been used and/or filled, they must be removed by the approved waste removal contractor and replaced with new spill kits.</p> <p>Hydrocarbon spills must be cleaned immediately using supplied hydrocarbon spill clean-up kits. These spill kits must be inspected regularly to avoid running out of hydrocarbon spill kits.</p> <p>Maintenance and repairs of vehicles must be conducted at the workshop area. Any breakdowns and repairs that cannot be done at the workshop must be done with drip trays to prevent hydrocarbons from entering the clean environment.</p> <p>Oil traps and containment units will be constructed around the workshop area to contain oil and hydrocarbon spills. These oil containment units will be emptied by the approved waste removal company and disposed of appropriately.</p> <p>Oil drums and fuel tanks must be stored within a bunded wall area that can contain the volume and 10% extra of the oil drums or fuel tanks stored within them. The bunded wall area will be lined so that no oil or fuel spill can escape from it into the clean environment.</p> <p>General housekeeping will be conducted in and around the mining area.</p> <p>The local community can be included in major clean-up projects to spread awareness and opportunities with regards to waste management.</p> <p>Bathrooms, showers and laundries will be inspected to ensure that they are in a good working condition and that no human waste or contaminated water affects the health of the employees, visitors or the environment. Any problems with the infrastructure must be reported immediately and repaired as soon as possible.</p> <p>Any environmental spill or emergency must be handled in terms of the Zibulo emergency preparedness plan (Melchior, 2015).</p>	
Section 6.2: In Fulfilment of Section 39(3)(d) of the Act, Read Together with Regulation 50(h), 50(b) and 51(b)(iv))				
Section 6.2.1.	Mechanisms for and compliance submission information of	<p>Six monthly submissions:</p> <ul style="list-style-type: none"> • Surface water monitoring results; • Groundwater monitoring results. <p>Annual submissions:</p> <ul style="list-style-type: none"> • Air quality monitoring for fallout dust; • Noise monitoring; • Updated water balance; • Potential changes in vegetation and fauna; • Revision of the rehabilitation financial provision calculator, with an auditor's report on the 	<p>Monthly submissions:</p> <ul style="list-style-type: none"> • Monthly dust monitoring will be conducted and reports kept on site. If dust fallout exceeds the legal limits the relevant legislative processes are to be followed. <p>Quarterly submissions:</p> <ul style="list-style-type: none"> • Monthly surface- and bi-annual groundwater monitoring results will be submitted to the DWS. <p>Bi-annual submission:</p> <ul style="list-style-type: none"> • Rehabilitation monitoring will be undertaken by the Land Management Superintendent and a report will be kept on site for internal and external auditors. • Invertebrate Habitat Assessment System (IHAS) and the latest SASS (South African Scoring System) must be conducted as per condition 4.2 of the Zibulo Opencast WUL (04/B20G/AGJ/809). These reports will be submitted to DWS 	<p>Amendment: Aligned with the Zibulo Opencast IWUL, added authorities to whom submissions should be made to.</p>

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
		amount available in the Trust.	twice a year. Annual submissions: <ul style="list-style-type: none"> Noise monitoring will be conducted as needed to update any additional noise impacts. This report will be submitted to the DMR upon completion. An updated water- and salt balance will be conducted on an annual basis and submitted to the DWS (as per the IWUL). The financial provision will be updated annually based on the current state of the mining area and the progress of the rehabilitation. The annual financial provision will be submitted to the DMRE. 	
EA Amendments				
Contact Person				
Multiple instances in the EA	-	The original EA is addressed to Mr. Henri Niewoudt who was the contact person when the EA was issued, this has changed.	Contact person: Mr. Melchior Joseph.	Amendment: The contact person was updated to the relevant person.
Scope of Authorisation				
Commissioning and operation of the activity.	Section 3.9.	Fourteen (14) days written notice must be given to the Department that the activity will commence. Commencement for the purposes of this commitment includes site preparation. The notice must include a date on which it is anticipated that the activity will commence.	N/A	Deletion: This condition was removed from the EA as no new activities are planned at the Zibulo Colliery Opencast. This commitment will continuously result in a non-compliance until it is removed from the EA.
	Section 3.22.	Once the designated areas for waste skips and the planned amounts have been finalised, the mine has to obtain a Section 20 application from the DWAF in terms of the Environmental Conservation Act (Act no. 73 of 1989).	N/A	Deletion: This condition is was removed from the EA as the legislation has been repealed.
	Section 3.26.	Topsoil and subsoil must be sprayed with dust allaying agent immediately after being stockpiled.	Topsoil and subsoil stockpiles, that will remain for six months or longer, must be vegetated to prevent compaction, erosion and contamination until such time that it is used for rehabilitation.	Amendment: This condition was amended as spraying a dust allaying agent on topsoil and subsoil is hazardous to the soil as it affects the quality and nutrients thereof.
	Section 3.33.	If spills do occur and soils become contaminated, the appropriate remedial measures must be identified in consultation with appropriate qualified specialists.	Any hydrocarbon spills must be cleaned immediately using the hydrocarbon spill kits that are present on site. If a hydrocarbon spill is too large to be cleaned with the available hydrocarbon spill kits, a certified waste removal contractor must be consulted and appointed by the mine.	Amended: This condition was reworded to describe the action taken better.
	Section 3.36.	Water sprays must be used in the loading of stockpiles.	N/A	Deletion: It is unclear to which stockpiles are referred. This commitment was removed due a lack of clarity and the fact that it was financially unviable to construct a sprayer system at all of the stockpiles.
	Section 3.46	Consultation and cooperation with local law enforcement agencies must be established to ensure that legal and regulatory compliance on the roads is adhered to.	When blasting closer than 500m to the R545 or the N12 highway, road closure will be necessary during blasting times to prevent the risk of fly rock injuries to motorists. Road closures will be done in conjunction with the Traffic Authorities.	Amendment: This commitment was reworded to be more inclusive and relevant of what is happening on site.

Aspect	Impact	Original EMPr Commitments	Proposed New EMPr Commitments	Reason for Amendment
	Section 3.58.	The local municipality and local residents must be pro-actively informed of any road closures and diversions.	N/A	Deletion: This commitment will be combined with Section 3.46.
	Section 3.59.	The Expansion Project must link with the Integrated Development Plan (IDP) of the eMalahleni Local Municipality especially with regards to the planning processes to ensure adequate water supply and other programmes.	N/A	Deletion: This commitment was removed from the EA as no expansion project is/ or was planned.
General	Section 3.70.	The holder of the authorisation must notify the Department, in writing and within 24 (twenty-four) hours, if conditions of this authorisation are not adhered to. Any notification in terms of this condition must be accompanied by reasons for the non-compliance.	The holder of the authorisation must notify the Department, on an annual basis during the Regulation 34 audit, if conditions of this authorisation are not adhered to. This notification must be done in writing. Any notification in terms of this condition must be accompanied by reasons for the non-compliance.	Amendment: This commitment has been reworded as to provide Zibulo with a practical amount of time to notify the Department of any commitments that are not adhered to.

8.3 UNDERTAKING TO COMPLY

I,, the undersigned and duly authorised thereto by **Anglo American Inyosi Coal (Pty) Limited – Zibulo Colliery: Opencast** have studied and understand the contents of this document in its entirety and hereby duly undertake to adhere to the conditions as set out therein including the amendment(s) agreed to by the Regional Manager.

Signed at this.....day of.....20.....

Signature of applicant

Designation

APPROVAL

Approved in terms of Section 39(4) of the Mineral and Petroleum Resources Development Act, 2002 (Act 29 of 2002)

Signed at..... this..... day of..... 20.....

REGIONAL MANAGER

REGION: _____

9. REFERENCES

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10. APPENDICES
