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Integrated Environmental Authorisation and IWULA for proposed Dorsfontein East Mining Extension

Closure Cost Assessment Report

Prepared for:

Exxaro Coal Central (Pty) Ltd

Project Number:

EXX5725



July 2021



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This document has been prepared by Digby Wells Environmental.

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Name	Responsibility	Signature	Date
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1 Introduction

Exxaro Coal Central (Pty) Ltd (ECC) appointed Digby Wells Environmental (Digby Wells) to conduct a Closure Cost Assessment (CCA) associated with the proposed Dorsfontein East Mining extension. Exxaro holds an approved Mining Right with reference number **MP 30/5/1/2/3/2/1 (51) MR** for opencast and underground mining at the Dorsfontein East Coal Mine (DECM) situated in the Mpumalanga Province. The current proposal aims to extend the existing approved underground mining area (approved under the ownership of Total Coal South Africa (Pty) Ltd) and introduce supporting infrastructure to achieve this. Exxaro aim to extend the underground mining area of the 2 Seam and 4 Seam associated with the Mining Right.

2 Project Description

The proposed extension is envisaged to cover an area of approximately 3288,53 ha on various portions of the farms Bosch Krans, Dorsfontein, Fentonia, Rietkuil, and Welstand. in the jurisdiction of the Nkangala District Municipality, Mpumalanga Province. The regional location of the project and the mining right boundary are shown in Figure 5-1.

The project aims to expand the DECM's underground mining area within the existing Mining Right Areas MP30/5/1/2/51MR. DECM was previously owned by Total Coal South Africa (Pty) Ltd (Total) and was ceded to ECC on 20 August 2015 which has an approved Environmental Management Plan (EMP), dated October 2017. ECC is now applying to expand the underground mining areas as approved under Total. Subsequently, additional coal reserves have been identified for mining which are not covered under the existing approval. ECC is also approved to undertake underground mining of deeper coal reserves at DECM. The underground mining operations will be accessed from the existing Pit 2 open cast and Dorsfontein West operations. DECM therefore intends to further extend the Life-of-Mine (LOM) through the exploitation of these identified additional coal reserves between 2021 until 2034 (14 years).

In addition, a portion of Pit 3, which is approved for opencast mining, will now be included into the underground mining extension. The Pit 3 coal reserves are contained in both Seam 4 and Seam 2.

3 Approach and Methodology

The methodology followed in the costing for the proposed infrastructure involved the following:

- Request detailed layout plans of the required infrastructure proposed for the extension;
- Conduct a GIS analysis of the infrastructure layout for inclusion into the costing model and develop updated site layout plans referenced to the costing model and report;
- Complete the costing calculations using quantities supplied by GIS analysis and current unit rates from the Digby Wells database; and

- Compile this closure costing report reflecting the assumptions made in the closure cost assessment and the closure cost summary.

4 Available Information

The closure costing is based on the following information:

- Layout plans provided by [Katlego Coal](#)~~Exxare~~;
- GIS attribute data compiled by Digby Wells;
- Google Earth KML's extracted from layout plans provided by ~~Exxare~~[Katlego Coal](#); and
- Final Environmental Scoping Report (Digby Wells, January 2021).

5 Battery Limits for Closure

The battery limits applied in the closure cost assessment for the proposed extension is are listed below and further reflected in Figure 5-2:

- Portal ventilation fan;
- Sewage Treatment Plant;
- Water Treatment Plant;
- Potable Water storage tank;
- Erikson Pond;
- A new 22 kV overhead powerline from the existing substation to a new 22kV substation;
- Run of Mine (ROM) Stockpile conveyor at portal;
- Change house;
- Lamp room;
- Office;
- Clinic;
- Stores;
- Workshop area; and
- Coal discard processing plant.

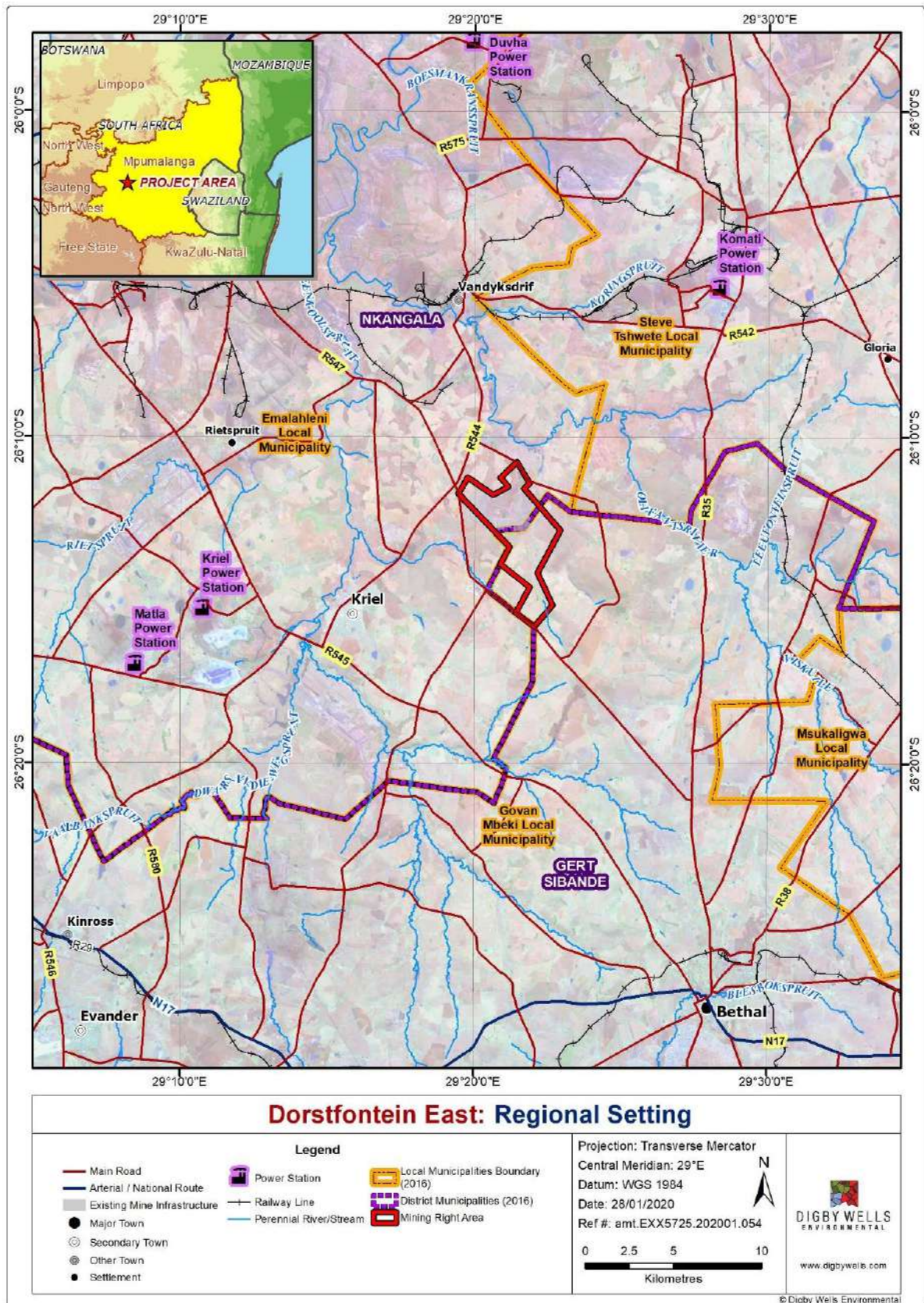


Figure 5-1: Regional Setting of the DECM

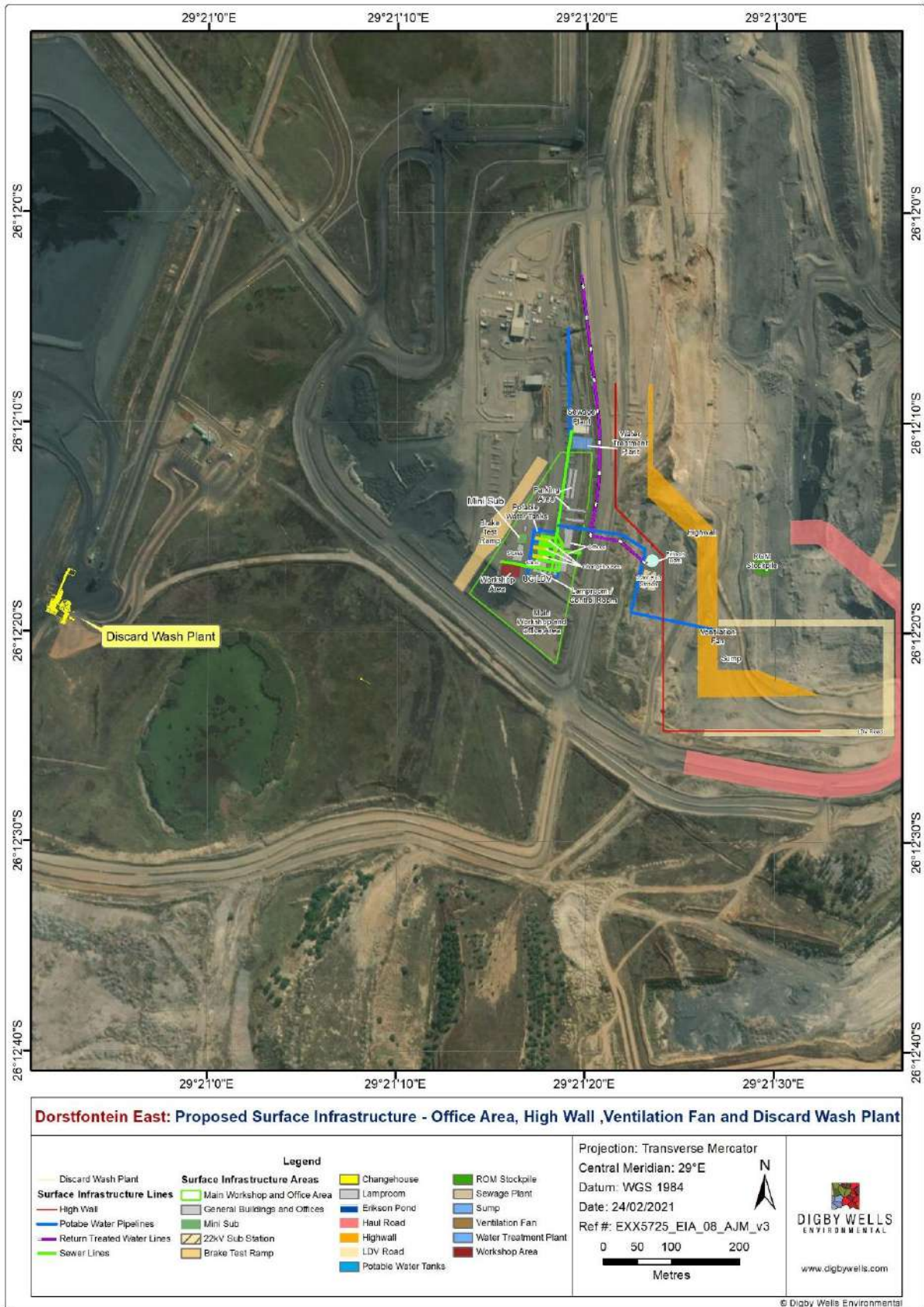


Figure 5-2: Surface Infrastructure Layout

6 Closure Measures

The closure measures applied in the CCA are detailed in **Error! Not a valid bookmark self-reference..**

Table 6-1: Site Specific Rehabilitation and Closure Measures

Aspect/ Area	Rehabilitation measures
Infrastructure	<p><u>Workshops, Offices, Discard Wash Plant and other Supporting Infrastructure</u></p> <ul style="list-style-type: none"> • Demolish and remove all concrete structures to 1 m below ground level; • Dismantle steel structures and store in designated salvage yard prior to removal/selling off; • Demolish brick structures and including concrete foundations; and • Demolish all paving walkways and parking areas. <p><u>Haul roads, tar and gravel roads</u></p> <ul style="list-style-type: none"> • Not applicable since the proposed Haul Roads are located over already disturbed mining land.
Mining Aspects	<p><u>Opencast pits and mining stockpiles</u></p> <ul style="list-style-type: none"> • Not applicable, existing disturbance and not costed for as part of the expansion project. <p><u>Discard dump</u></p> <ul style="list-style-type: none"> • Not applicable, existing disturbance and not costed for as part of the expansion project.
General Surface Rehabilitation	<ul style="list-style-type: none"> • Not applicable since all infrastructure and roads to be constructed as part of the expansion project are located on already disturbed mining areas.
Monitoring and Maintenance	<ul style="list-style-type: none"> • Groundwater monitoring costs are included for ten years post-closure; • Surface water monitoring costs are included for ten years post-closure; and • Vegetation monitoring and maintenance on rehabilitated areas are excluded since there are no vegetation establishment costs allocated, under the assumption that the already disturbed land on which the proposed infrastructure will be located is costed for in the site wide closure cost liability for DECM.

7 Assumptions and Qualifications

The closure costing assumptions and the site-specific rehabilitation and closure measures included are addressed in the Sections that follow.

7.1 General

- The closure costing addresses decommissioning and demolition associated with the proposed infrastructure to be developed as part of the expansion project. Surface rehabilitation associated with infrastructure footprints is excluded from the CCA since this infrastructure is to be constructed on already disturbed land;
- It is assumed that third party contractors would be commissioned to establish on site (preliminary and general costs included) to undertake the demolition activities;
- Unless firm agreements with the next land users are in place, it is assumed that all infrastructure will be demolished and removed;
- No discounting of potential value recovered from the sale of the plant, steel or other material removed from site is considered; and
- The closure cost estimate is exclusive of VAT.

7.2 Infrastructure

- All quantities applied for infrastructure demolition were supplied by the Digby Wells GIS team, as per layout data supplied by Exxaro;
- Detailed designs for the planned Discard Wash Plant were not available, and quantities associated with this plant will need to be updated once these become available. A multiplication factor of ten was applied to the Digby Wells steel demolition unit rate to ensure adequate provision is made for demolition of this plant, since steel quantities in tonnes are not yet available, and the only quantity available is the surface area of the Discard Wash Plant;
- It was assumed that the containers will be mobile and moved off site by a third party contractor; and
- It was assumed that all concrete foundations associated with steel buildings and containers will be 250 mm thick.

7.3 Demolition Waste

Disposal of demolition waste has not been included in this closure cost assessment and should be included once there is better resolution on the quantity and types of wastes requiring disposal at closure. Demolition waste disposal within the open pit or down the shafts is possible, but the waste will need to be screened prior to disposal to ensure it is inert, and this activity will require approval if it is not included in DECM's Environmental Management Programme.

7.4 Mining Aspects

- No rehabilitation costs were included for the discard dump, since this is an existing disturbance and does not form part of the expansion project;
- Allowance for rehabilitation of the highwall to be constructed has not been included in this closure cost assessment under the assumption that this cost will form part of the rehabilitation costs for Pit 2; and
- Allowance for sealing access shafts to the underground workings in Pit 2 has not been included in this closure cost assessment, it is assumed that this cost will be included in the rehabilitation costs associated with Pit 2 in the closure liability for the entire DECM operation. Engineering designs related to the proposed shafts to be developed in Pit 2 are not available at this stage, therefore capping/ sealing requirements for the shafts will need to be confirmed once these designs have been completed.

7.5 General Surface Rehabilitation

- Allowance included for general surface rehabilitation associated with the infrastructure footprint areas was not accounted for, since the proposed infrastructure will be constructed on an already disturbed area; and
- It is assumed surface rehabilitation of these areas is already included in the site wide closure cost liability for DECM.

7.6 Monitoring and Maintenance

- Surface and groundwater monitoring was accounted for over a ten year period on a bi-annual monitoring frequency;
- It was assumed surface water monitoring would be undertaken at five monitoring locations associated with the expansion area; and
- It was assumed groundwater monitoring would be undertaken at five monitoring boreholes and allowance was not included for the drilling of any new boreholes that may be required (particularly at the proposal Discard Wash Plant).

7.7 Additional Allowances

- Preliminary and Generals (P&Gs) were applied at 20% of the rehabilitation and demolition costs; and
- Contingencies were applied at 15% of demolition and rehabilitation costs.


7.8 Residual Closure Costs

Residual closure costs such as post-closure subsidence monitoring and long-term water management costs associated with the proposed expansion were not included in this CCA. These costs should be included in the closure cost liability for the entire DECM operation once/ if this proposed expansion is approved.

8 Calculation Summary

The estimated financial provision for closure of Dorsfontein East Coal Mines extension amounts to **R 18,378,859** (excl. VAT and including P&Gs and Contingencies at 20% and 15%, respectively). The closure cost estimate breakdown is included Table 8-1.

Table 8-1: Closure Cost Summary for the Proposed Dorsfontein East Expansion Project

 DIGBY WELLS ENVIRONMENTAL	Digby Wells Environmental Exxaro Central Coal (Pty) Ltd, Dorsfontein East Coal Mine, EXX5725 Revision: 0
Area and Description	Life of Mine 2034
Infrastructure demolition	
Area 1: Dorsfontein East	R12,759,441
Sub-total	R12,759,441
Rehabilitation	
Area 1: Dorsfontein East	R0
Sub-total	R0
Total Demolition & Rehabilitation	
	R12,759,441
Monitoring and Maintenance	
Monitoring Costs (Groundwater and Surface water)	R1,153,614
Sub-total	R1,153,614
Preliminary and General (20%)	R2,551,888
Contingency (10%)	R1,913,916
Sub-total	R4,465,804
GRAND TOTAL	R18,378,859

9 Recommendations for Improvement

The following actions are recommended to improve the resolution of the closure cost estimate and to advance the rehabilitation and closure planning and implementation accuracy:

- Specialist studies required to further inform the closure costs should be undertaken to improve the closure cost accuracy going forward, this includes contaminated land assessments and quantification of the demolition waste and waste classifications associated with the expansion area;
- Once the proposed infrastructure has been constructed the quantities applied in the CCA should be reassessed based on detailed designs for the expansion infrastructure, particularly the Discard Wash Plant;

- Long-term water treatment management costs associated with the Seam 2 and Seam 4 extension areas have not been accounted for in this closure cost assessment and should be included in the closure costs for the entire operation once the expansion project has been approved; and
- The above will require an update of the geohydrological model for closure of the operation, predicted decant dates, decant flows and decant qualities should be updated and water management measures should be determined based on this information.

