CONFIDENTIAL AND LEGALLY PRIVILEGED REPORT

Independent Competent Person's Report on Greenside Colliery

Report Prepared for

South Africa Coal Operations (Pty) Ltd

Report Number 566644

Report Prepared by

srk consulting

SRK Consulting (South Africa) (Pty) Ltd

Report Ref: 566644_Greenside CPR Final

Report Date:25 March 2021

Effective Date: 31 December 2020 [12.10(a), SR9.1(iii), SV1.2]

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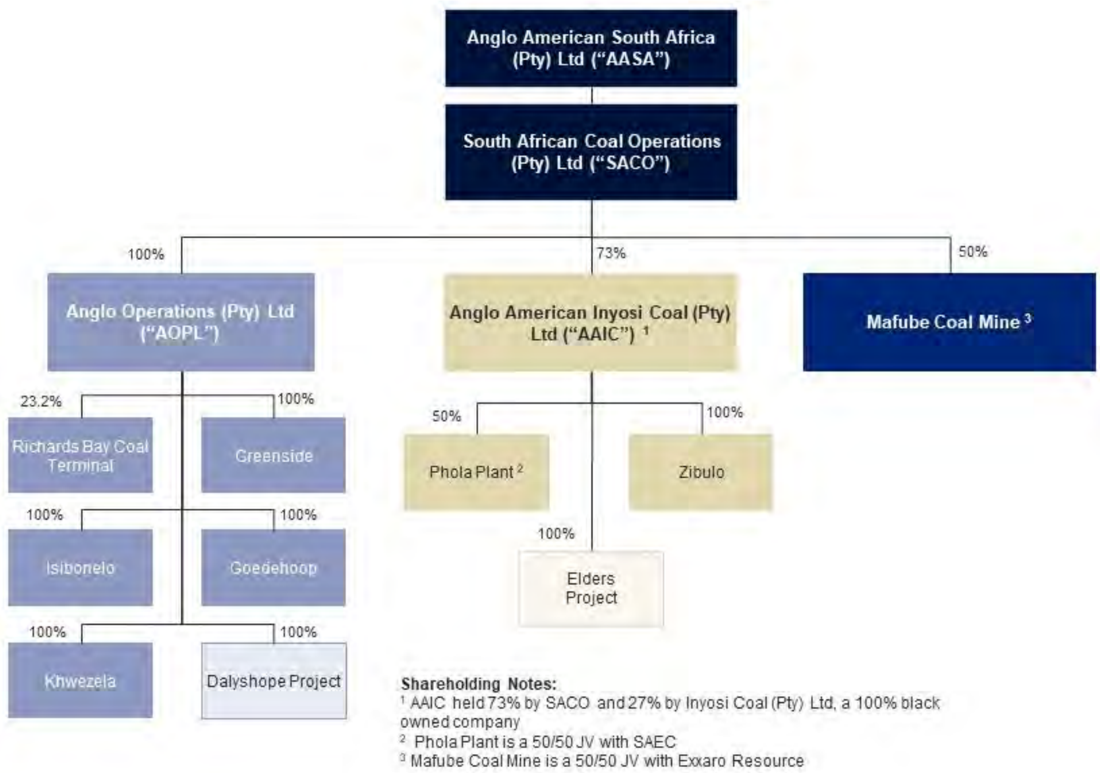
Executive Summary

ES1: Introduction

[12.10(h)(i)] [SR1.1(i)] [SV1.2]

SRK Consulting (South Africa) (Pty) Ltd (**SRK**) was commissioned by South African Coal Operations (Pty) Ltd (**SACO**) (Figure ES.1) to compile a Competent Person's Report (**CPR**) on Greenside Colliery (**Greenside**) in Mpumalanga, South Africa (Figure ES.2). The Anglo American Group will be separating its South African thermal coal operations, which comprise the operations held by SACO, by way of a demerger ("**Demerger**") and the transfer of such operations to Thungela Resources Limited (the **Company**). The Company is incorporated in South Africa and all of the issued, and to be issued, Shares of the Company are expected to be admitted to the main board of the JSE Limited (**JSE**) as a primary listing and admitted to the standard listing segment of the UK Official List and to trading on the main market for listed securities on the London Stock Exchange (**LSE**). Any reference to the Company in this report should be read to also include SACO, as relevant.



srk consulting	**GREENSIDE COLLIERY CPR** Illustrative Existing Group Structure and Interests in Coal Assets *(Source: pers. comm. Harding, C., 2021)*	Project No. 566644

Figure ES.1: Simplified Corporate Structure and Interests in Coal Assets

This report has been prepared by SRK for inclusion in the pre-listing statement and prospectus, or similar (**Listing Documentation**) to be published by the Company in connection with the Demerger and the proposed admission of the Company's issued and to be issued ordinary shares to:

- Trading on the "Mining" sector of the JSE as a primary listing;
- The standard listing segment of the UK Official List; and
- Trading on the LSE's Main Market for listed securities (collectively the **Offer**).

This report, which summarises the findings of SRK's review, has been prepared to satisfy the requirements of:

- A Competent Person's Report as set out in Chapter 12 of the Listing Rules of the JSE (the **JSE Rules**) and follows the form and content of a Mineral Asset Valuation Report as specified by the 2016 Edition of "*The South African Code for the Reporting of Mineral Asset Valuations"* (the **SAMVAL Code**); and
- The requirements of the UK Prospectus Regulation Rules made by the Financial Conduct Authority (**FCA**) pursuant to section 73A (4) of the Financial Services and Markets Act 2000 (**FSMA**) (**UK Prospectus Regulation Rules**) and the UK version of Regulation (EU) 2017/1129) of the European Parliament and of the Council of 14 June 2017 and repealing Directive 2003/71/EC and the delegated acts, implementing acts and technical standards thereunder as such legislation forms part of retained EU law by virtue of the European Union (Withdrawal) Act 2018, in conjunction with the European Securities and Markets Authority (**ESMA**) update of the Commission of European Securities Regulators (**CESR**) recommendations for the consistent implementation of the European Commission's Regulation on Prospectuses No 809/2004 (CESR/05-054b) issued (**ESMA Recommendations**), specifically, Clauses 131 to 133 and Appendices I and II.

SRK, has given and has not withdrawn its written consent to:

(i) The issue of the Listing Document with the inclusion of the references to its name; and

(ii) The inclusion of information extracted from this CPR in "Part VIII—Business Overview" of the Listing Document, and has authorised the contents of this CPR and references thereto as part of the Listing Document for the purposes of Item 1.3 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018.

In compliance with Item 1.2 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018, SRK accepts responsibility for this CPR and, to the best of SRK's knowledge, declares that the information set out in this CPR is in accordance with the facts and this CPR makes no omission likely to affect its import.

The reporting standard adopted in this CPR for the reporting of the Coal Resources and Coal Reserves for Greenside is the 2016 Edition of "*The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves"* (The **SAMREC Code**) as prepared by the South African Mineral Resource Committee Working Group under the auspices of the Southern African Institute for Mining and Metallurgy (**SAIMM**) and the Geological Society of South Africa (**GSSA**). The definitions of the relevant terms, methodologies and estimation processes employed and the reporting for South African Securities Exchange purposes for the Coal Resources and Coal Reserves in this report are according to those set out in the "*The South African -guide to the systematic evaluation of coal exploration results, coal resources and coal reserves"* (**SANS 10320:2020**) published by Standards South Africa, a division of the South African Bureau of Standards (**SABS**).

The reporting standard adopted for the reporting of the valuation for Greenside is the SAMVAL Code, as prepared by the South African Mineral Asset Valuation Working Group under the auspices of the SAIMM and the GSSA.

This report also satisfies the disclosure requirements of *"The South African Guideline for the Reporting of Environmental, Social and Governance Parameters within the Solid Minerals and Oil and Gas Industries"* (the **SAMESG** Guideline).

This report has been prepared under the direction of the Competent Persons (**CPs**) and Competent Valuator (**CV^2**) in accordance with the requirements of the SAMREC (**SR**) and SAMVAL (**SV**) Codes and the SAMESG Guideline (**ESG**). Note that two "CV" abbreviations are used throughout this document:

- CV^1 refers to Calorific Value; and
- CV^2 refers to Competent Valuator.

A shorthand notation has been adopted to demonstrate compliance with the JSE Rules and disclosure requirements of the SAMREC/SAMVAL Codes, for example:

- [12.10(d)] represents section 12.10(d) of the JSE Rules;
- [SR1.1] represents item 1.1 - Property Description of Table 1 of the SAMREC Code;
- [SV1.4] represents criterion T1.4 - Compliance of Table 1 in Appendix A of the SAMVAL Code; and
- [ESG2.3] relates to Item 2.3 included in the SAMESG Guideline.

ES2: Effective Date and Valuation Date

[12.10(a)] [SR9.1(iii)] [SV1.2, SV1.13]

The Effective Date for this CPR is 31 December 2020 (the **Effective Date**).

The Coal Resource and Coal Reserve statements set out in this CPR are reported at 31 December 2020 and represent the Coal Resources and Coal Reserves at the Effective Date as estimated by SRK.

The declaration of Coal Reserves as at the Effective Date of 31 December 2020 includes a forecast of four months (September to December 2020) to the allocated position. However, information gained during the review is that Greenside has not achieved its planned production targets during the first six months of 2020: it is SRK's opinion that any variation between the planned and the actual Coal Reserves will not be significant.

The LoM plan and associated technical and economic parameters (**TEPs**) included in the LoM plan and techno-economic model (**TEM**) all commence on 1 January 2021 and are presented in constant money terms (cost estimates are at the Effective Date and ignore inflation and any real increase due to escalation).

The financial results for Greenside are taken to be correct at 31 December 2020, the Effective Date of the CPR, which is also the **Valuation Date**.

ES3: Project Outline

[12.10(h)(ii) (iii)] [SR1.1(i), SR1.2(i)] [SV1.5, SV1.2] [ESG4.5]

Greenside is an underground coal mine located approximately 120 km east of Johannesburg and approximately 15 km southwest of eMalahleni (previously Witbank), in Mpumalanga Province, South Africa (Figure ES.2). The mine falls within the eMalahleni Local Municipality, within the Nkangala District Municipality. It forms part of the South African Coal Estate (**SACE**) complex, along with Khwezela Colliery (the amalgamation of Landau and Kleinkopje Collieries). The location of Greenside is shown in Figure ES.1.

The Rail Load-out Terminal (RLT) is situated approximately 2.5 km northeast of the mine infrastructure area and is shared with Khwezela, while the eMalahleni Water Reclamation Plant (**EWRP**) is shared between Greenside, Khwezela and South African Energy Coal Ltd's (**SAEC)** South Witbank Colliery. There is one Mineral Residue Deposit (**MRD**), the Greenside MRD, a coal preparation plant complex and an incline shaft (Daylight Shaft or Cairn Shaft) that accesses the underground workings.

ES4: Overview of Material Assets and Legal Status

[12.10(h)(iv)] [SR1.5] [SV1.5]

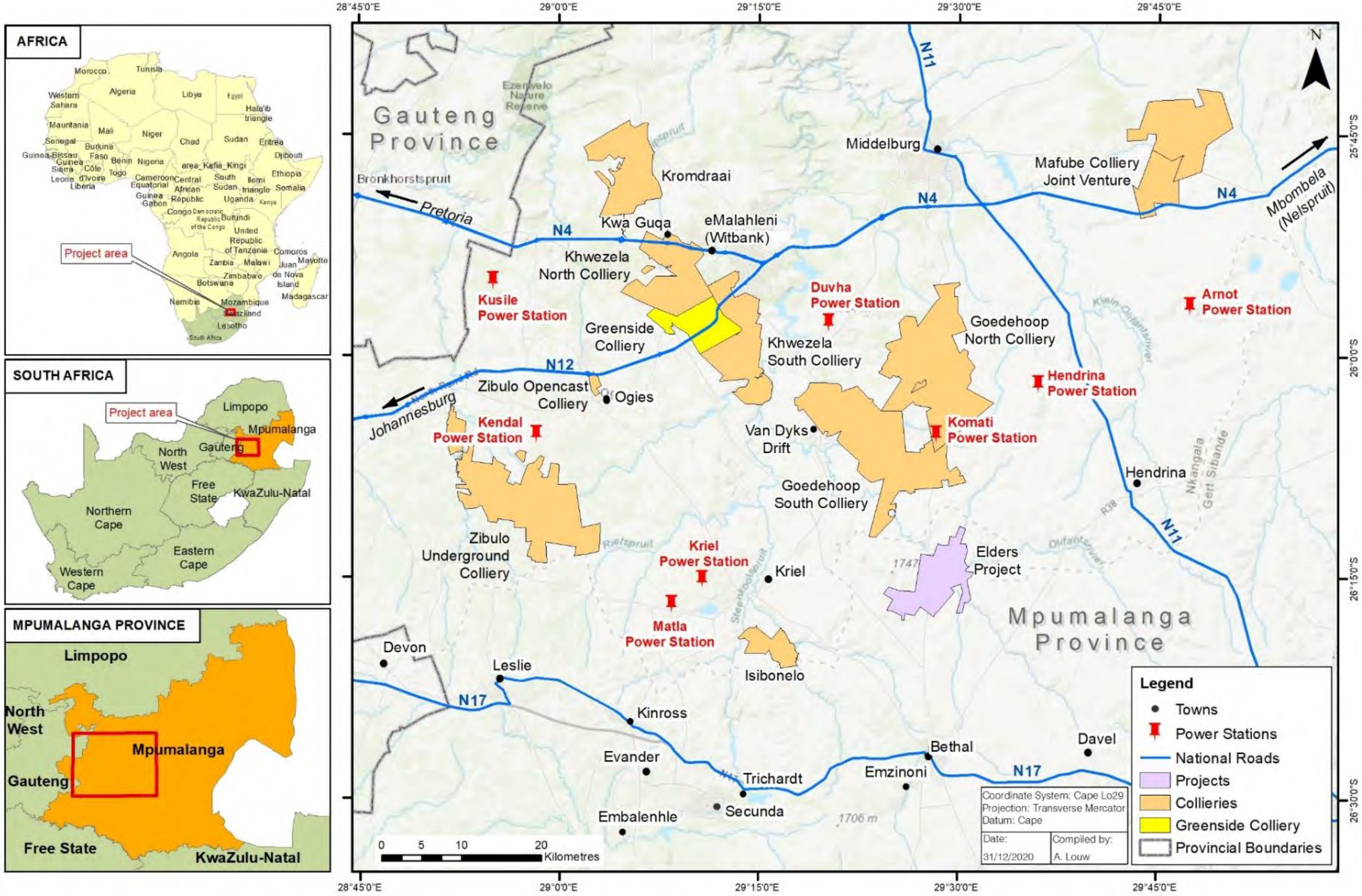
The prospecting and Mining Rights covering Greenside, along with the Greenside Area of Responsibility (**GAR**), is shown in Figure ES.3. The GAR is the area mined by Greenside that extends past the boundaries of the colliery itself into adjacent Company-owned areas. A summary of the Mining Rights covering Greenside is given in Table ES-1, Table ES-2 lists the water use licences while a summary of registered land claims is shown in Table ES-3.

Table ES-1: Summary of the Company's Mining Rights covering the GAR

Name	Number	Rights Type	Area (ha)	Grant Date	Expiry Date	Seams in GAR
Landau	MP 30/5/1/2/2/306 MR	Mining	12 858.5798	31/07/2008	30/07/2029	No 5 Seam
Greenside	MP 30/5/1/2/2/304 MR	Mining	4 304.3668	05/05/2008	30/07/2034	No 5 Seam, No 4 Seam, No 2 Seam, No 1 Seam
Kleinkopje	MP 30/5/1/2/2/307 MR	Mining	7 152.0349	03/11/2009	02/11/2030	No 4 Seam
Vlaklaagte	MP 30/5/1/1/2/184 PR	Prospecting	17.1306	01/04/2015*	31/03/2018	No 4 Seam, No 2 Seam, No 1 Seam
	MP 30/2/1/2/2/10199 MR	Mining Right application	17.1306	18/02/2018	Pending	No 4 Seam, No 2 Seam, No 1 Seam

Table ES-2: Summary of Water Use Licences

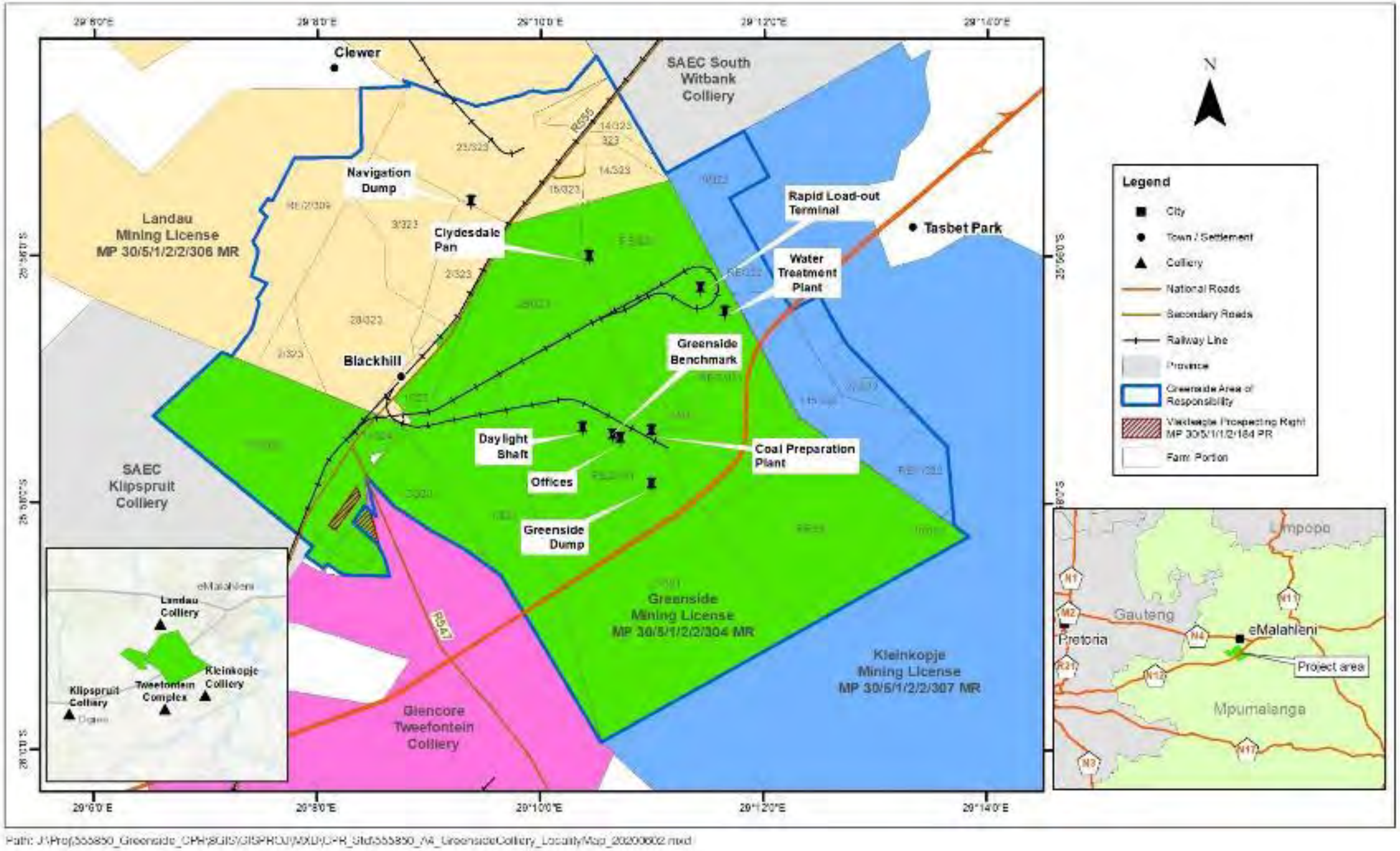
Licence Number	Description	Approval Date	Comments
16/2/7/B100/C80	GNR704 Exemption (4b) - undermining Clydesdale Pan	19/02/2012	
04/B11G/CGI/3730	Amended Retreatment Plant WUL	04/07/2018	Originally approved 25/08/2015 and amended on 04/07/2018
04/B11G/G/2219	Amended PCD WUL	04/07/2018	Originally approved 07/02/2014 and amended on 04/07/2018
06/B11G/CGI/8851	3A North Dump WUL	22/02/2019	
04/B11G/AEGJ/1197	Amended IWUL	28/03/2019	Originally approved 19/07/2011



GREENSIDE COLLIERY CPR
Location of the Company's Operations, highlighting Greenside Colliery

Project No. 566644

Figure ES.2: Location of the Company's Operations highlighting Greenside Colliery



srk consulting	**GREENSIDE COLLIERY** Prospecting and Mining Rights covering the GAR	Project No. 566644

Figure ES.3: Prospecting and Mining Rights covering the GAR

Table ES-3: Registered Land Claims over Greenside Colliery

Number	Farm and Portion	Current Owner	Description of Land Claim
1	Weltevreden 324JS RE and 3	Truter Boerdery Trust	Lodged by MG. Mtsweni; Rule 5 en route for approval in March 2015. Government Gazette Notice No. 27047 on 10th December 2004; reference number 6573
2	Weltevreden 324 JS	Truter Boerdery Trust	B.J. Mahlangu already compensated by the Memorandum of Understanding (**MOU**). Receive compensation equal Portion 2 of the land. Awaiting claimant verification and options.

ES5: Geological Setting

[12.10(h)(v), SR2.1, SV1.2, SV1.7]

Regional Geology

[SR2.1(i)]

Coal is found in South Africa in 19 coalfields, located mainly in KwaZulu-Natal, Mpumalanga, Limpopo, and the Free State, with lesser amounts in Gauteng, the North West Province and the Eastern Cape. All the coal deposits are found in the Karoo Supergroup, the majority in the Vryheid Formation of the Ecca Group, consisting predominantly of sedimentary rocks. Greenside is located near the northern extent of the Witbank Coalfield, within the Mpumalanga Province of South Africa.

The Witbank Coalfield extends for over 180 km in an west-east direction between Springs in the west to Belfast in the east and 50 km from north to south between Middelburg in the north and Rietspruit in the south, where it is separated from the Highveld Coalfield by the basement palaeohigh known as the Smithfield Ridge. The area is underlain by sedimentary rocks of the Karoo Supergroup, deposited 248 – 290 Ma during the Permian Period (Hancox & Götz, 2014). The thickness of the Karoo Supergroup varies from thin in the north to thickest the palaeovalleys and towards the south, with the variation in thickness primarily due to the uneven nature of the pre-Karoo topography. This uneven pre-Karoo topography is also responsible for the controlling the presence and thickness of the Dwyka Group sequence.

Stratigraphy

The Karoo Supergroup comprises, from oldest to youngest, the Dwyka, Ecca and Beaufort Groups, with the coal seams hosted within the Vryheid Formation of the Middle Ecca Group (270 Ma). The stratigraphy of the Witbank Coalfield is well described by Hancox & Götz (2014). The basal Dwyka Group sequence comprises massive diamictites with lesser matrix-supported conglomerates and coarse-grained sandstones. Occasional siltstone interbedded with sandstone, pebbly mudstones and varved siltstones are also present. The diamictites are composed of sub-angular to sub-rounded clasts primarily comprising granites, quartzites, mudstones and calcareous sandstones.

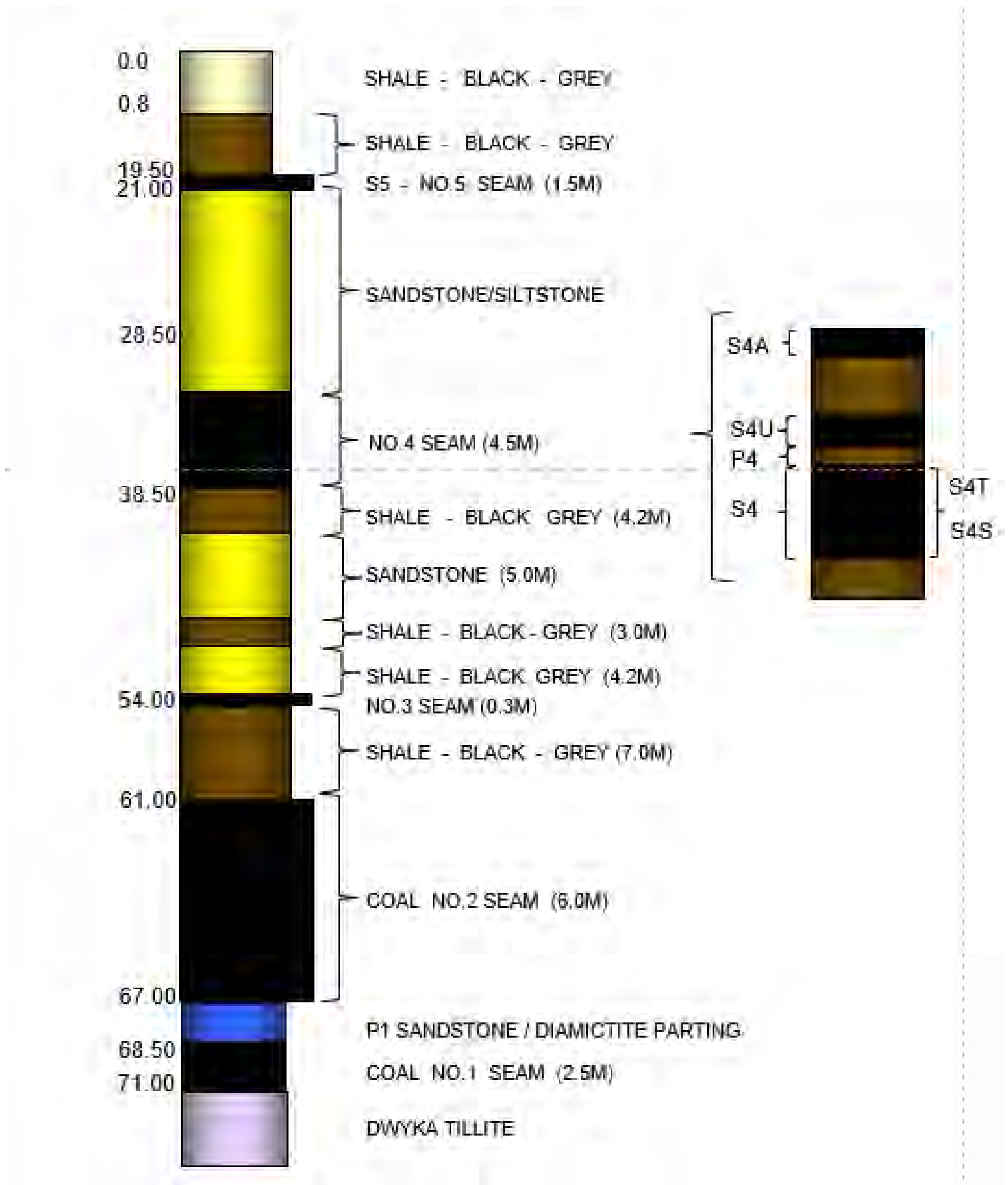
The Vryheid Formation overlies the diamictites and other glacially derived sediments of the Dwyka Group. The Vryheid Formation sediments represent coal-capped upward fining cycles of clastic sediments, deposited in a fluviodeltaic/shallow marine environment. The formation is characterised by a variety of sandstones, mudstones and siltstones, with lesser amounts of coal and occasional gritstones. Five coal seams are present within the Vryheid Formation, the No 1, 2, 3, 4 and 5 Seam, named from the base up.

The No 1 and Number 3 Seams (**No 3 Seams**) are thin and discontinuous throughout the coalfield. The Number 2 Seam (**No 2 Seam**) is between 1.5 and 4.0 m thick where it is laterally continuous, comprising mainly dull coal; it has been extensively mined and little unexploited coal remains. The Number 4 Seam (**No 4 Seam**) averages 4.0 m and is now the most important seam (Jeffrey, 2005). It ranges from 1 – 12 m thick across the coalfield, and shale intercalations are common in the upper part of the seam. The Number 5 Seam (**No 5 Seam**) is present over most of the coalfield, attaining mineable thicknesses in the northern and western portions of the field only. The No 5 Seam comprises bright to dull coal, with shale intercalations.

Local Geology

Surface material at Greenside consists of weathering products of the sandstones, siltstones and mudstones of the Vryheid Formation, with isolated patches of dolerite in the southwestern part of the GAR. The top layer consists of reddish-brown sandy soil, with clayey-sandy subsoil below. Weathering generally does not extend deeper than approximately 12 m at Greenside, except where adjacent to dolerite dykes and close to surface water bodies. In these instances, weathering may reach up to 17 m below the surface. Weathering negatively affects the mineable Coal Resource, but rarely has an impact of the physical mining operation in terms of mining method and design.

Strata at Greenside (Figure ES.4) are typical of the Witbank Coalfield, with all five coal seams being present on the property. Underlying the coal sequence of the Vryheid Formation are glacial deposits of the Dwyka Group, which accumulated on the erosional pre-Karoo basement surface. The distribution of the lower seams (No 1 and No 2 Seams) is controlled by the underlying palaeotopography while that of the uppermost No 5 Seam is controlled by the level of the present-day erosion. The seams are generally flat lying and gently undulating.



srk consulting	**GREENSIDE COLLIERY CPR** Typical Stratigraphy encountered at Greenside Colliery (AAC, 2019 *Greenside R&R Reconciliation Presentation*)	Project No. 566644

Figure ES.4: Typical Stratigraphy at Greenside Colliery

Numerous southwest-northeast trending dolerite dykes were encountered during mining of the No 2 Seam; these are also encountered during extraction of the No 4 Seam. The most prominent structural feature is the northwest-southeast trending fault, which divides the colliery into two distinct portions. The throw on this fault has been measured at approximately 30 m in the southeast, but gradually decreases northeastwards. Numerous smaller faults splay off with end of this main fault. A second large fault is encountered in the western portion of the mine, trending north-northwest, with associated dolerite emplacement. Mining has been impacted by both dykes and faults, to varying degrees; in places mining has had to stop well before either of these features while in others it was possible to mine through them (Figure ES.5). SRK is of the opinion that the geology is well understood, and appropriate consideration has been given to the impact of the geology on mining.

srk consulting	**GREENSIDE COLLIERY CPR** Structural Interpretation for Greenside Colliery *(Source: Greenside CPR, 2019 - AAC, 2019b)*	Project No. 566644

Figure ES.5: Structural Interpretation for Greenside Colliery

ES6: Exploration and Drilling

[12.10(h) (vi)] [SR3.1, SR3.2(i)-(v)] [SV1.8]

Historical exploration carried out by the previous owners has been incorporated into the current geological database and model. This data consists of drill hole and channel samples and their analytical results. In addition, holes were drilled by the Company at various times since 1949. Please note that not all these drill holes are used in the geological model.

Current exploration drilling is governed by the relevant sections of Anglo American Coal Standard(s).

Future Planned Exploration

A summary of the future exploration expenditure is given in Table ES-4.

Table ES-4: Greenside Exploration Drilling Budget

Region	Core Drill Holes	Total Length (m)	Cost Estimate (ZAR)	Samples Planned	Cost Estimate (ZAR)	Indirect Costs (ZAR)	Labour Costs (ZAR)	Total Cost Estimate (ZAR)
Waterpan North	12	960	864 000	108	486 000	205 130	612 006	2 167 136
3ANorth	23	800	720 000	207	931 500	205 130	612 006	2 468 636
Village	6	240	216 000	54	243 000	205 130	612 006	1 276 136
Total	**41**	**2 000**	**1 800 000**	**369**	**1 660 500**	**615 390**	**1 836 018**	**5 911 907**

ES7: Geological Model Review

[SR2.1(vii),SR4.1(ii) (iv) (v)]

The Greenside model under review was created by U Herrmann, a Resource Geologist Superintendent at the Company, using Datamine's StratModel™ Software. The model was created using StratModel™ version 6.1.1 and reviewed by SRK using StratModel™ version 7. The model is dated 25 March 2019, with a data cut-off date of 28 February 2019.

The Greenside model was evaluated to assess:

- How the physical and quality drill hole data were loaded and evaluated;
- That the modelled data accurately reflected the original drill hole data;
- The interpolation parameters used to create the model;
- The interpretation of the data to ensure that the final structural model is a reasonable reflection of the coal in the ground; and
- That the Coal Resource estimation methodologies were correct and appropriate.

Model and data validations included the following:

- Topographic surface generation and evaluation – evaluating whether surveyed collar coordinates fall within 2 m of the topographic surface and understanding any discrepancies;
- Evaluating any differences between the drill hole data and the model interpretation;
- Structural interpretation of dolerite intrusions, faulting, seam pinch out and subcrop etc.;
- Quality checks and evaluation - checking that the data load tables contain no sampling gaps, that all standardised coal quality values for unsampled material have been included where necessary; the sample compositing rationale (the correct method is to only composite data for which there are no missing samples or depth overlaps) and examining quality plots for "bull's eyes" which require corroboration;
- The correct application of Coal Resource cut-off limits; for example, minimum seam thickness, crop lines and mined out areas;
- The polygon classification determined by SRK was in accordance with the SANS13020:2020 guidelines; and
- The Greenside model is an established model which is well understood and managed. The supporting Anglo Standards and Procedure Documents ensure that there is a high level of confidence regarding the model.

ES8: Coal Resources Summary

[12.10(a)] [SR1.4(iii), SR4.1(iv), SR4.5(ii) (iv) (v) (vii), SR6.1(i), SR6.3(vi)] [SV1.9]

The Coal Resource estimates were conducted in accordance with the SAMREC Code, 2016 Edition, as well as SANS10320:2020.

The Coal Resource estimate has been independently estimated by Ms K. Black of KJB GeoServices and signed off by Ms L. Jeffrey on behalf of SRK, based on the model supplied by the Company and verified by SRK. The Coal Resource estimate is declared as at 31 December 2020.

SRK applied the following cut-off parameters when estimating the resources:

- The seam extent was constrained by:
  - The Mining Right boundary; and
  - The limit of weathering;
- Maximum ash content 50%;
- Minimum volatile matter content 17%;
- Minimum seam thickness/theoretical mining height 2.0 m; and
- Maximum theoretical mining height 4.5 m.

The Greenside Coal Resource on an MTIS air-dried basis amounts to 65.37 Mt. This estimate is made up of Measured, Indicated and Inferred *in situ* Coal Resources, both inside and outside of the Mine Plan (57.17 Mt) and the tonnage ascribed to the MRD (8.2 Mt).

The *in situ* Greenside Coal Resource on a MTIS air dried basis (**adb**) amounts to 57.17 Mt. The estimate is made up of 51.08 Mt of *in situ* Measured Coal Resources (89%), 1.59 Mt of *in situ* Indicated Coal Resources (3%), 4.5 Mt of *in situ* Inferred Coal Resources (8%). The 8.2 Mt of Measured Coal Resources derived from the MRD comprises 12.5% of the total Greenside Coal Resource estimate of 65.37 Mt. The average inherent moisture (**IM**) of the *in situ* coal is 2.2%. The estimate for the MRD is that as determined by the Company; SRK has reviewed the methodology employed by the Company to estimate the potential MRD resources and is of the opinion that is has been done conservatively and correctly; the MRD estimate is included in SRK's Coal Resource Statement (in a separate table). The remaining volume of material in the MRD is significantly larger than indicated in the Coal Resource Statement but requires further evaluation before it can be classified as a Coal Resource.

The Coal Resources for Greenside on a total basis[1] (100% attributable to Greenside) at 31 December 2020 are summarised in Table ES-5 (*in situ* coal) and Table ES-7 (MRD material); the raw coal qualities (adb) are shown in Table ES-6 (*in situ* coal) and Table ES-7 (MRD material).

The Coal Resources have been subdivided into those inside and outside the Life of Mine Plan, which has been determined using the specified mine design parameters within the economic footprint (SANS 10320:2020, clauses 3.2.5, 8.1.1.1, 8.1.2.3 and Table F1).

Coal Resources inside the mine plan are reported inclusive of the Coal Reserves.

[1] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to the Greenside Area of Responsibility and is equivalent to the term "gross" used in the AIM Mining Guidance.

Table ES-5: SRK Greenside No 4 Seam MTIS Coal Resource Statement at 31 December 2020 (adb)

Block	Resource Classification Category	Mining Method	Seam	Theoretical Mining Height (m)	Area (ha)	Seam Thick-ness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
INSIDE THE MINE PLAN									
West Block	Measured	UG+BP	No 4	2.0 – 4.8	43.89	3.92	1.51	7.0	2.38
Central Block	Measured	UG+BP	No 4	2.0 – 4.8	107.09	4.43	1.55	7.0	6.85
	Indicated	UG+BP	No 4	2.0 – 4.8	2.10	2.40	1.52	12.5	0.07
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**109.19**	**4.40**	**1.55**	**7.1**	**6.92**
East Block	Measured	UG+BP	No 4	2.0 – 4.8	716.99	3.10	1.57	7.0	32.45
	Inferred	UG+BP	No 4	2.0 – 4.8	58.40	3.15	1.6	15.0	2.5
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**775.38**	**3.10**	**1.57**	**7.6**	**34.95**
Total Inside the Mine Plan		**UG+BP**	**No 4**	**2.0 – 4.8**	**928.47**	**3.35**	**1.57**	**7.5**	**44.25**
OUTSIDE THE MINE PLAN									
West Block	Measured	UG+BP	No 4	2.0 – 4.8	145.13	3.90	1.54	7.0	7.89
Central Block	Measured	UG+BP	No 4	2.0 – 4.8	19.84	4.78	1.56	7.0	1.37
East Block	Measured	UG+BP	No 4	2.0 – 4.8	2.37	3.80	1.63	7.0	0.14
	Indicated	UG+BP	No 4	2.0 – 4.8	30.87	3.59	1.57	12.5	1.52
	Inferred	UG+BP	No 4	2.0 – 4.8	45.52	3.34	1.6	15.0	2.0
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**78.76**	**3.50**	**1.59**	**13.7**	**3.66**
Total Outside the Mine Plan		**UG+BP**	**No 4**	**2.0 – 4.8**	**243.73**	**3.87**	**1.56**	**8.9**	**12.92**
GRAND TOTAL (Inside + Outside the Mine Plan + MRD)			**-**	**-**	**1172.20**	**3.47**	**1.56**	**7.8**	**57.17**

Notes:
1. Total is 100% of the Coal Resources attributable to the mining licence and is equivalent to the term gross used in the AIM Mining Guidance.
2. Coal Resources quoted in decreasing order of geological confidence.
3. Fresh coal only, and coal within Mining Right boundary.
4. UG+BP = Underground Bord and Pillar.
5. OC = Opencast.
6. Minimum seam thickness cut-off of 2.0m.
7. Theoretical mining height cut-off of 4.5 m.
8. Ash < 50% cut-off applied.
9. VM > 17% cut-off applied.
10. ARD – Apparent Relative Density.
11. All seam thicknesses used are true thicknesses.

Table ES-6: SRK Greenside No 4 Seam Average Raw Coal Qualities (adb)

Block	Resource Classification Category	Seam	ASH (%)	CV¹ (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)
INSIDE THE MINE PLAN								
West Block	Measured	No 4	21.2	24.63	53.6	2.4	1.44	22.9
Central Block	Measured	No 4	24.8	23.05	50.0	2.6	1.30	22.8
	Indicated	No 4	22.0	24.58	52.3	2.4	1.46	23.3
	Subtotal		**24.7**	**23.06**	**50.0**	**2.6**	**1.30**	**22.8**
East Block	Measured	No 4	26.4	23.09	48.1	2.3	1.59	23.2
	Inferred	No 4	26.3	23.2	48.8	2.4	1.8	22.5
	Subtotal	No 4	**26.4**	**23.10**	**48.1**	**2.3**	**1.61**	**23.2**
Average Inside the Mine Plan		**No 4**	**25.8**	**23.18**	**48.7**	**2.4**	**1.55**	**23.1**
OUTSIDE THE MINE PLAN								
West Block	Measured	No 4	23.8	23.82	50.8	2.3	1.73	23.0
Central Block	Measured	No 4	24.8	23.12	50.4	2.8	1.25	22.0
East Block	Measured	No 4	31.1	21.13	41.5	2.2	1.92	25.2
	Indicated	No 4	26.0	23.07	47.2	2.4	1.82	24.4
	Inferred	No 4	26.0	23.3	48.5	2.4	1.7	23.1
	Subtotal	No 4	**26.2**	**23.13**	**47.7**	**2.4**	**1.74**	**23.7**
Average Outside the Mine Plan		**No 4**	**24.6**	**23.55**	**49.9**	**2.4**	**1.68**	**23.1**
AVERAGE		**-**	**25.6**	**23.26**	**49.0**	**2.4**	**1.58**	**23.1**

Notes:
1. Weighted average qualities estimated on MTIS.
2. adb = air dried basis.
3. CV¹ - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.

Table ES-7: Greenside MRD Resource Estimate

Area	Block Area (ha)	Volume (Mm^{3})	GTIS (Mt)	Ash (%)	Bulk Density (g/cm^3)	CV¹ (MJ/kg)	IM (%)	(%)SU
Bullnose	11.265	1.059	1.694	44.24	1.60	16.18	2.1	2.75
West Flank	8.202	1.539	2.462	46.22	1.60	15.50	2.0	2.97
East Flank	13.303	3.081	4.929	45.71	1.60	15.65	2.1	2.83
Upgraded	4.890	0.838	1.340	42.45	1.60	16.25	2.7	3.43
Subtotal (2019 estimate)	***32.770***	***6.516***	***10.426***	***45.17***	***1.60***	***15.78***	***2.2***	***2.93***
Less mining during 2020			2.226					
Total (2020 estimate)			**8.2**					

Note:
1. GTIS = Gross Tonnes *In Situ*

ES9: Reconciliation with the Previous Coal Resource Estimate

[SR1.4(iii), SR4.2(v), SR4.5(vi), SR6.1(iii)] [SV1.6]

Table ES-8shows the reconciliation between the 2020 and 2019 Coal Resource estimates. The 2020 estimate was done by SRK, while the 2019 estimate was done by the Company (2019b).

Table ES-8: Reconciliation with the Previous Resource Estimate

Block	Resources Classification Category	Seam	MTIS Coal Resources			
			Mass (Mt)		CV[1] (MJ/kg)	
			2020	2019	2020	2019[1]
Greenside	Measured	No 4	51.08	54.5	23.27	23.03
	Indicated	No 4	1.59	2.3	23.14	23.53
	Inferred	No 4	4.5	0.2	23.27	23.41
MRD	*Measured*	*Discard*	*8.2*	*8.8*	*15.87*	*15.87*
GRAND TOTAL		**-**	**65.37**	**65.8**	**23.26**	**23.03**

Note:
1. GS = Greenside
2. MRD = Mineral Residue Deposit (derived from the No 5, No 4, No 2 and No 1 Seam discard material).
3. CV converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg)
4. Note that the MRD CV has not been considered in the average CV[1].

Although the two estimates appear to be very similar, they are not comparable due to a difference in the seams/sub-seams selected for resource estimation by the Company. This has resulted in an under-estimation by the Company of between 15 and 20 Mt, although it is not possible to reconcile the two estimates. SRK has consulted with the Company's Resource Geology Specialist; who concurs with this finding.

The differences between the SRK Coal Resource estimates (65.37 Mt) and those of the Company (65.8 Mt) are explained by the following:

- The difference in the seams/sub-seams selection (between 15 and 20 Mt). The Company did not select the full seam when estimating the Coal Resources, but only selected sub-seams; this was done in error and not done intentionally. The impact occurs where a seam is labelled with the full seam name in the model, and not with sub-seam names. For good resource estimation practice, the full seam name should always be included when specifying the seams and sub-seams for estimating the Coal Resources. It should be noted that the sub-seams occur in the identical footprint to the full seam, so there is no change in area, only a change in the vertical thickness of the estimate;
- The exclusion by SRK of certain polygons in the Central Block (approximately 9.0 Mt);
- The downgrading of three polygons in the East Block from Indicated to Inferred Coal Resource category, with a resultant increase in the geological loss of 2.5% (0.4 Mt);
- SRK applied both a minimum and maximum theoretical mining height, which was not applied by the Company (1.90 Mt); and
- Mining between December 2019 and December 2020 (forecast to total 4.65 Mt).

The difference in the estimates is material, but SRK believes that it has been adequately explained in the points above and in Section 6.9.

ES10: Rock Engineering

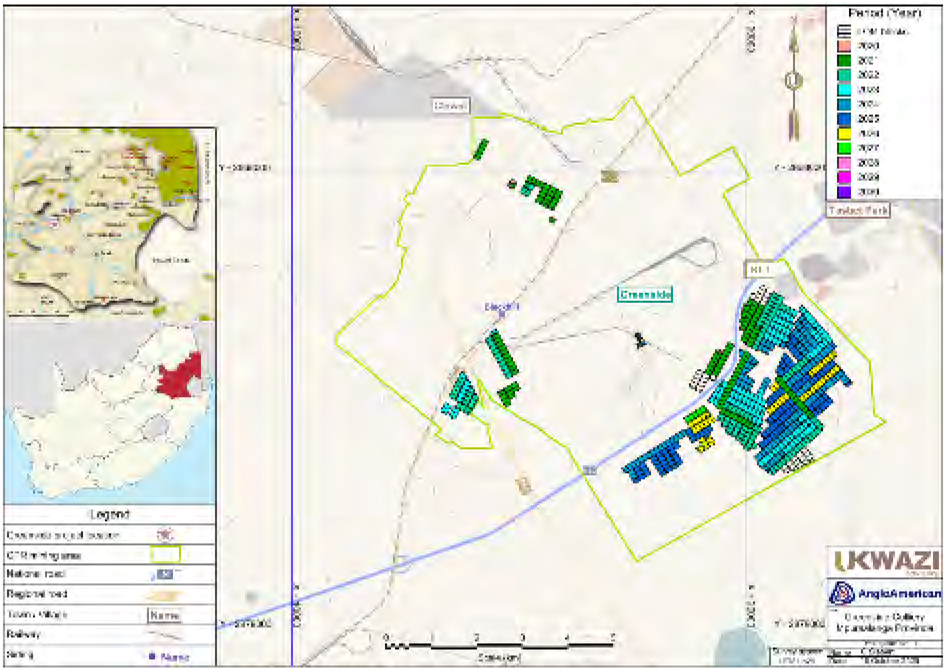
[12.10(h) (vii)] [SR3.1(i), SR4.1(ii), SR4.3(ii), SR5.2(ii) (viii)]

Greenside has comprehensive procedures in place for managing rock engineering risks. The roof conditions are generally very good and operational discipline and compliance appear to be satisfactory. The Trigger Action Response Plan (**TARP**) system (AAC, 2019g) is generally effective and hazardous conditions appear to be identified and addressed. There are a few exceptions, but these are addressed through the systems. Subsidence protection and undermining of surface structures appears to be well managed.

ES11: Mining

[12. 9(h) (vii)] [SR4.2(ii), SR4.3(ii), SR5.2(i)(iv), SR6.1(ii)] [SV1.10]

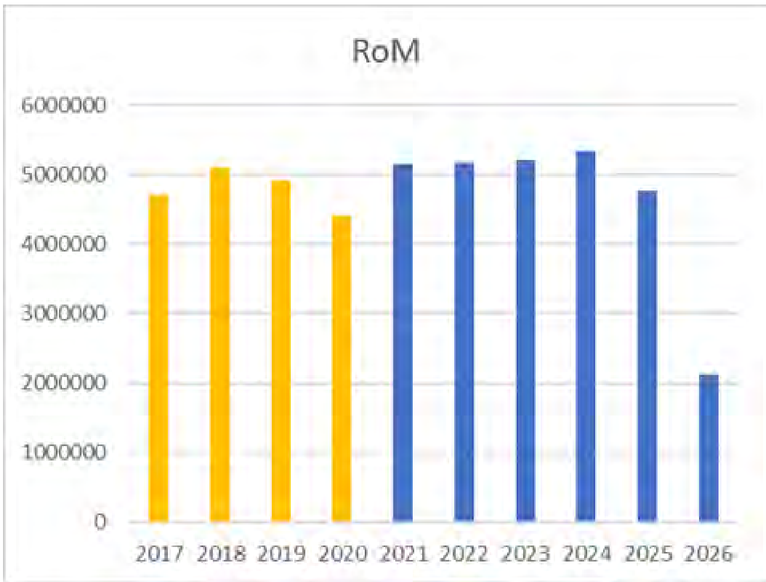
The mine is completing the extraction of the remaining No 4 Seam resources and has deployed five underground sections to recover the coal. The coal seam is relatively shallow, enabling a high extraction rate in the panels and thus a high productivity. The overall mine plan is to complete the remaining panels in the north of the property and to then develop the southern portion as illustrated in the mining sequence plan shown in Figure ES.6:



srk consulting	GREENSIDE COLLIERY CPR LoM Schedule Time Sequence	Project No. 566644

Figure ES.6: LoM Schedule Time Sequence

The mine faces a declining mining height over time due to decreasing seam height and an increasing degree of geological issues, which will affect the productivity of the mining sections. There is also a reduction of sales yield as the outer portions of the No 4 Seam are mined; the mine will have to balance the extraction across the panels to mitigate this (Figure ES.7). The mine is expected to produce approximately 4.8 Mtpa for the next six years.



srk consulting | **GREENSIDE COLLIERY CPR** Historical Performance; RoM UG vs 2020 LoM Plan | Project No. 566644

Figure ES.7: Historical Performance RoM UG vs 2020 LoM Plan

Ventilation and Cooling

[SR5.2(vii) (viii)]

Flammable gas (methane) and coal dust explosions are one of the principle hazards in underground coal mines. In order to prevent an accumulation of flammable gas, sufficient ventilation has to be provided in the last through roads to maintain air speeds above the critical velocity of 1.0 m/s.

At peak production from six production sections, a total quantity of 890 m^3/s including allowance for other commitments (workshops, etc.) and leakage is available for the mine. The ventilation quantity is sufficient to provide air speeds above the minimum of 1.0 m/s in the last through roads.

The Life of Mine plans show the workings can be adequately ventilated.

ES12: Historical Production

[SR1.4(iii)] [SV1.6]

Historical production per mining section for the past four years is shown in Table ES-9 and also illustrated in Figure ES.5 where the total mine production historically is contrasted with the planned production. Note that figures for 2020 incorporate the impact of the COVID-19 national lockdown.

Table ES-9: Historical Production per Mining Section

Section	2017 (Mt)	2018 (Mt)	2019 (Mt)	2020 (Mt)
George	1.00	1.02	0.87	0.71
Thandeka	1.05	1.11	1.10	0.90
Thusanang	0.89	1.00	1.13	1.00
Vumagara	1.12	1.20	1.16	1.08
Shosholoza	0.62	0.73	0.71	0.73

ES13: Key Modifying Factors

[12.10(h) (vii)] [SR5.1(i)(ii), SR6.1(iii), SR6.2(i)] [SV1.10]

The following Modifying Factors were applied in Gradecon (an in-house Company software package) when converting No 4 Seam Coal Resources to Saleable Coal Reserves (Table ES-10):

Table ES-10: Modifying Factors

Modifying Factor	Blocks	Value
Geological loss	All	7%
Mining loss	All	2.5%
Mining extraction	All	Variable, depending on Safety Factor required
Contamination	Navigation, Waterpan North No 4 Seam, East	5%
	Weltevreden	3%
Moisture correction	All	2.5%
Minimum practical mining height	All	2.0 m
Maximum practical mining height	All	4.5 m
Product yield	All	>40% (no mining blocks where this restriction applies)

ES14: Coal Reserves Summary

[12.10(h) (ix)] [SR4.2(ii), SR4.5(i), SR5.1(i), SR5.2(ix), SR5.6(v), SR6.3(i) (ii)] [SV1.2, SV1.9]

The Coal Reserve estimate has been independently estimated by and signed off by Mr N McGeorge on behalf of SRK, based on the mining model supplied by the Company and verified by SRK. The Coal Reserve estimate is declared as at 31 December 2020.

The Coal Reserves for Greenside on a total basis[2] (100% attributable to Greenside) at 31 December 2020 are summarised in Table ES-11.

[2] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to the Greenside Area of Responsibility and is equivalent to the term "gross" used in the AIM Mining Guidance.

Table ES-11: Greenside Coal Reserve Statement at 31 December 2020

RoM Coal Reserves				Saleable Coal Reserves (NAR)				
Reserve Category Classification	**RoM_{ar} (Mt)**	**Total Moisture (%)**	**CV^1_{adc} (kcal/kg)**	**Reserve Category Classification**	**Sales (Mt)**	**Practical Yield (%)**	**Total Moisture (%)**	**CV^1_{ar} (kcal/kg)**
Proved	25.8	8.0	5 202	Proved Prime	16.7	64.6	8.0	6 006
				Proved Secondary	1.3	5.3	8.0	4 930
Probable	0.1	8.0	4 889	Probable Prime	0.0	63.9	8.0	5 993
				Probable Secondary	0.0	4.7	8.0	4 943
Total	**25.9**	**8.0**	**5 201**	**Total**	**18.0**	**69.8**	**8.0**	**5 927**
Inferred in Mine Plan	1.9	8.0	5 194	Prime	1.2	65.3	8.0	6 076
				Secondary	0.1	5.3	8.0	4 967

Note:
1. Assumes coal supply until 2026.
2. RoM_{ar} = Run of Mine on an as received basis.
3. Coal sales quality is as received, RoM quality is air dried contaminated for comparison to 2019 estimates.
4. CV^1_{adc} = Calorific Value air dried, contaminated.
5. CV^1_{ar} = Calorific value as received.

The Coal Reserves are extracted from the mining schedule model and are from the Effective Date to the last period scheduled (2026). All the Coal Reserves are from the No 4 Seam. The Saleable Coal quality is quoted on a Gross as Received basis to match the way coal prices are quoted in the financial evaluation.

ES15: Reconciliation to Historical Coal Reserve Estimates

[SR1.4(iv), SR4.2(v), SR4.5(vi), SR6.1(iii)]

The previous estimate of Coal Reserves was conducted in 2019 with an Effective Date of 31 December 2019. The comparison between the Coal Reserves of 31 December 2020 and 31 December 2019 are illustrated in Table ES-12.

Table ES-12: Comparison of Greenside Coal Reserves at 31 December 2020 and 31 December 2019

Reserves Classification Category	RoM Coal Reserves				Saleable Coal Reserves			
	Mass (Mt)		CV^1_{adc} (kcal/kg)		Mass (Mt)		CV^1_{ar} (kcal/kg)	
	2020	**2019**	**2020**	**2019**	**2020**	**2019**	**2020**	**2019**
Proved	25.8	21.3	5 202	5 190	18.0	15.3	5 927	5 940
Probable from Measured	0.1	12.6	5 914	4 890	0.0	9.9	5 915	5 933
Probable from Indicated		1.7		5 480		0.1		
Total Reserves	**25.9**	**35.5**	**5 201**	**5 100**	**18.0**	**25.3**	**5 927**	**5 933**
Inferred in LoM Plan	1.9	0.1	5 194	4 730	1.2	0.05	5 985	5 880
Total in Mine Plan	**27.8**	**35.6**	**5 201**	**5 110**	**19.2**	**25.3**	**5 901**	**5 920**

Note:
1. CV^1_{adc} = Calorific Value air dried, contaminated.
2. CV^1_{ar} = Calorific Value as received.

In the Company CPR dated 31 December 2019, the schedule differs from the current schedule in that the blocks in the northeastern portion have been returned to Coal Resources, which accounts for approximately 1.81 Mt. Similarly, the Inferred Coal Resources in the 2020 Mine Plan are only partially mined and are returned to Coal Resources from the 2019 Mine Plan (2.5 Mt). The depletion in the two time periods is estimated at 4.6 Mt and the difference between the two estimates is 10.3 Mt, of which the above explanations account for 8.9 Mt between the estimates. This is demonstrated in Table ES-13.

Table ES-13: Reconciliation between the 2019 and 2020 Coal Reserve Estimates

Description	Tonnage (Mt)	Comment
Coal Reserve Estimate 2019	**35.5**	
Exclude Coal Reserves in Northeast Block	-1.8	Blocks under MRD
Exclude Inferred Coal Resources	-2.5	No quality data
Less Coal mined in 2020	-4.6	
Less other blocks not mined	-0.7	
Coal Reserves 2020	**25.9**	

ES16: Coal Processing

[12.10(h) (vii)] [SR4.3(ii), SR5.3(iii)]

Greenside coal processing consists of a number of sections that have been modified and have mutated over the years. The plants that were originally used to wash the No 2, 4 and 5 Seams now wash primarily the No 4 Seam and the re-mined discard dump. The No 4 Seam plant has also been modified to produce a middlings product by adding three product cyclones. These are not ideal, as the second stage is not controllable and not efficient, but the reasons for installing them are understandable. A flotation plant, operated by external contractors, has been added to recover ultrafine coal. In addition, the ultrafine tailings are dewatered using filter presses which reduces water consumption and obviates the need for large slurry dams.

The plant that previously washed No 5 Seam coal, now primarily washes the discard dump to produce a middlings-type product. In addition, it can be used to wash No 4 Seam coal, which gives the complex flexibility. The washing plant complex can comfortably wash all the No 4 Seam coal produced from underground. However, if prime production increases then the No 5 Seam plant can be used to increase production and the discard could be washed later.

The plant produces a prime product – FEL, nominally 5 800 kcal/kg net as received (**NAR**) - and a middlings product – PRE, nominally 4 800 kcal/kg NAR. The prime product is moved via Conveyor K to the RLT, from where it is railed to Richards Bay Coal Terminal (**RBCT**) to the export market. Conveyor K is a constraint on the system, as is the RLT, particularly with a break for two to three weeks each year for maintenance. If the export coal cannot be conveyed to the RLT at the rate required, then extra coal can be trucked. The middlings coal is sold into the export and domestic markets.

The plant is well maintained, considering its age in parts and quality control is good with sufficient numbers of automatic samplers being used. However, feed to plant is not sampled and there are few efficiency tests conducted.

Overall, the plant would not be designed in its present form if the present duty had been envisaged at its inception. However, the plant has had to evolve over the years to do the current duty and as such it is adequate to the task and is not a constraint on the production from Greenside.

ES17: Coal Discard Disposal

[SR1.1(ii), SR5.4(ii)]

The total amount of mixed discards planned for deposition from end of 2018 until LoM 2026 is 11.6 Mt. The Discard Facility is operated and managed by the Mine, Zizwe Bulkmech (Operator) and Isithelo Technical Solutions (Pty) Ltd (**Isithelo**) (Engineer of Record), to ensure the design and integrity of the Discard Facility is maintained. The Discard Facility consists of a coarse discards delivery conveyor and a discards silo, filtration plant used to generate fine coal slurry as a filter cake, coarse discards deposition areas and a penstock previously used for decanting supernatant water from the slurry pool. Dirty water management is controlled by a high-density polyethylene (**HDPE**) lined Facility Return Water Dam, Lake Lucy, Y2K dam and Dam 3. Storm water runoff is managed by a combination of all these facilities

Monthly monitoring of discard Gas, Temperature, Density and Void tests is conducted, generally, these are found to be within acceptable limits.

Monthly Topographical Survey Monitoring is conducted to monitor discards deposition area and elevations, topsoil stripping and cladding, elevation of discards around slurry compartment, freeboard and penstock and water levels.

Quarterly audit inspections are discussed in a meeting where minutes are taken, and actions and due dates recorded for corrective action.

Annual audit inspections are conducted by Isithelo Technical Solutions (Pty) Ltd, who reviews the design and operation criteria information and covers visual inspections and surveillance.

The Greenside Discard Facility and New Tailings Dam are classified with a Consequence Classification of Structure (**CCS**) rating of Major. A dam break analysis and stability analyses are still required for further evaluation of the risk of slope failure. With a Major rating, the required suitably qualified competent person at the Mine is shared with a nearby facility.

A study is underway to incorporate the airspace capacity made available by in-situ coarse discards mining and determine the true airspace capacity available on the Discard Facility.

ES18: Infrastructure and Engineering

[SR4.3(ii), SR5.4(i) (ii), SR5.6(viii)]

The mine's infrastructure is robust and sufficient to provide for the LoM requirements. The agreed Notified Maximum Demand (**NMD**) at the two Points of Delivery (**POD**s) is enough to supply the power requirements of the mine; however, an application to increase the agreed NMD at Greenside 2 Cairns MD4404 POD was required, as the evidence provided indicated that the agreed NMD was exceeded from April to July 2019. Information received from the mine was that an increase in agreed NMD from 10 MVA to 12 MVA was applied for. The new agreed NMD took effect in October 2019.

The 2.2 kV single line diagram shows that some substations such as the security substation, main office substation and recreation club substation are still equipped with obsolete oil circuit breakers which are also a fire hazard. SRK recommends that upgrading of these circuit breakers to Vacuum Circuit Breakers (**VCB**s) be considered, for adherence to safety and spares availability. The electrical infrastructure inspected during the site visit appeared to be well looked after and well maintained.

The maintenance management systems employed by the mine appeared to be working properly and well managed, from maintenance scheduling to closing out of jobs.

ES19: Logistics

[SR5.4(iii)]

Greenside supplies coal to both the domestic and international market. For the international market, coal is supplied through the RBCT, via the RLT which is shared with other mines in the area. For the domestic market, coal is transported from site via various contractors, independent from the mine.

On-mine coal transport is by way of conveyor from the mine to the wash plants and thence to the product stockpiles. From these stockpiles, the coal is sent by conveyor for loading at the RLT or onto trucks for local dispatch. Some trucking of products to the RLT also takes place by independent contractors.

ES20: Occupational Health and Safety

[SR5.2(viii)]

Occupational Health

Coal dust is the main airborne pollutant in coal mines and the cause of Occupational Diseases, for example, Coal Workers Pneumoconiosis (**CWP**) and Chronic Obstructive Airway Disease.

The coal dust measurement results exceeding the Occupational Exposure Limit (**OEL**) have increased from 13% in 2017 to a consolidated 36% in 2020. In the same period, the diagnosed CWP cases decreased from five to one with zero Silicosis cases.

Compared with gold mine dust, the silica content in coal mine dust can be classified as a low health hazard (no silicosis cases diagnosed).

Most of the dust measurement samples exceeding the OELs were measured at the Continuous Miner areas. With occupational diseases having long lag periods before there are any symptoms of a disease, the diagnosed cases can fluctuate from year to year.

The diagnosed Noise Induced Hearing Loss cases (**NIHL**) cases increased from two cases in 2017 to six cases in 2018 and decreased from six in 2018 to one 2020. With NIHL having long lagging periods before there any symptoms, the diagnosed NIHL cases can fluctuate from year to year. However, in the quest towards zero harm, there is a downward trend in diagnosed cases.

Safety

The Company has good risk management and risk control procedures in place, which are actively followed by all levels of management. According to an external legal compliance audit conducted in June 2019, the Company complies with all legal requirements. The systems and procedures are commendable, with prompt investigation of Lost Time Injuries and necessary remedial actions being implemented.

In terms of the statistics, there have been no fatalities since 2013 to date, a commendable achievement for an underground colliery (Table ES-14).

The consistent improvement in lost time injuries from three in 2017 to a one in 2020 and the decrease in the Lost Time Injury Frequency Rate from 1.40 in 2017 to a consolidated 0.40 in 2020 (per million man-hours) is also a commendable achievement for an underground operation.

In the quest towards zero harm, the Company identified focal areas to further reduce work related incidents and accidents.

Table ES-14: Historical Safety Statistics

Category	2017	2018	2019	2020
Lost Time Injuries (LTI)	3	2	1	1
LTIFR per million man-hours	1.40	0.85	0.41	0.40
Fatalities	0	0	0	0

ES21: Environmental and Social Compliance

[12.10(h)(viii)] [SR4.3(ii), SR5.2(viii)], SR5.5(i)(ii)(iv)] [SV1.2] [ESG4.3, ESG4.4, ESG4.8]

The colliery received its first environmental authorisation on 1 March 2000 for an Environmental Management Programme Report (**EMPr**[3]). Greenside has been issued with four Water Use Licences (**WUL**s) and one exemption relating to the undermining of Clydesdale Pan dated 19 February 2012 for Greenside (Exemption number: 16/2/7/B100/C80). The colliery has undertaken several EMPr and WUL amendments and has applied for various other environmental authorisations as additional activities have been triggered in terms of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) (**MPRDA**), National Environmental Management Act (act No. 107 of 1998) (**NEMA**), National Environmental Management: Waste Act (59 of 2008) (**NEM:WA**) and National Water Act (Act 36 of 1998) (**NWA**) in line with the developing mining operations. The following EMPrs and Environmental Authorisations **(EAs)** are in place at Greenside:

- EMPr for Greenside: Nooitgedacht Underground Mine approved on 1 March 2000 by the then Department of Minerals and Energy (**DME**);
- Environmental Authorisation (**EA**) for a Pollution Control Dam approved on 15 August 2011 by the

[3] Previously referred to as an Environmental Management Programme (or EMPR) approved in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) before 8 December 2014. Post 8 December 2014 the EMPR is now referred to as an Environmental Management Programme Report (or EMPr) approved in terms of the National Environmental Management Act (Act 107 of 1998).

Department of Economic Development, Environment and Tourism (Ref No.: 17/2/3 N-17);

- Greenside Pollution Control Dam EMPr approved on 10 December 2012 by the Department of Mineral Resources and Energy (**DMRE**) (Ref No.: MP 30/5/1/2/3/2/1 (304) EM);
- EA for the construction of a coal discard dump retreatment plant approved on 5 December 2013 by the Department of Economic Development, Environment and Tourism (Ref No.: 17/2/3 N-165);
- Greenside EMPr for the construction of a coal discard dump retreatment plant approved on 5 December 2013 by the DMRE (Ref No.: MP 30/5/1/2/3/2/1 (304) EM);
- Greenside Aligned EMPr Approved on 2 December 2014 by the DMRE (Ref No.: MP 30/5/1/2/3/2/1 (304) EM);
- Greenside Thandeka Shaft EMPr approved on 23 December 2015 by the DMRE (Ref No.: MP 30/5/1/2/2(304) EM);
- EA for the Greenside 3A North Dump approved on 30 March 2016 by the Department of Agriculture, Rural Development, Land and Environmental Affairs (Ref No.: 17/2/3N-205); and
- Greenside Waterpan North EMPr approved on 4 December 2018 by the DMRE (Ref No.: MP 30/5/1/2/2(304) EM).

Since receiving the original Water Use Licence (**WUL**), the following licences have been issued to Greenside for water use related activities:

- Greenside Integrated WUL in terms of Chapter 4 of the National Water Act, 1998 (Act 36 of 1998) approved 19 July 2011 (Licence No.: 04/B11G/AEGJ/1197) by the Department of Water Affairs (DWA) (now the DHSWS). This licence was amended 28 March 2019 to factor in several amendments to conditions contained in the 2011 licence;
- Greenside 3A North Dump WUL in terms of Chapter 4 of the National Water Act, 1998 (Act 36 of 1998) approved on 22 February 2019 (Licence No.: 06/B11G/CGI/8851) by the DWS (now the DHSWS);
- Greenside Retreatment Plant WUL in terms of Chapter 4 of the National Water Act, 1998 (Act 36 of 1998) approved on 25 August 2015 (Licence No. 04/B11G/CGI/3730) by the DWS (now the DHSWS). This licence was amended to alter two Section 21(c) and (i) conditions and delete four 21(g) conditions which appeared in the original licence. This amendment was approved on 4 July 2018;
- Greenside Pollution Control Dam WUL in terms of Chapter 4 of the National Water Act, 1998 (Act 36 of 1998) approved on 7 February 2014 (Licence No.: 04/B11G/G/2219) by DWA (now the DHSWS). This licence was amended and approved on 4 July 2018 to factor in several amendments to conditions contained in the 2014 licence; and
- Greenside GNR704 Exemption (4b) for the undermining of Clydesdale Plan Approved 19 February 2012 (Exemption number: 16/2/7/B100/C80) (Source: GNR704 Audit, Shangoni, August 2019).

Environmental management at Greenside is undertaken by the environmental department which includes an Environmental Coordinator who is assisted by an Environmental Officer and environmental staff. The colliery makes use of an Environmental Management System to manage environmental data, incidents and reporting, which is ISO 14001:EMS:2015 accredited. The colliery undertakes annual internal ISO 14001 audits and recertification will take place in 2020. External and internal compliance audits are conducted on an annual basis on all existing environmental permits that have found a high level of compliance to the conditions set out in the permits. Exceedances in monitoring parameters have been observed over the past six to twelve months and the colliery is implementing action plans to address ongoing non-compliances and avoid being issued with directives or fines by the relevant environmental authority.

In terms of non-compliances with EMPrs and EA obligations, Shangoni compiled an EA and Performance Assessment Review Report (Reference Number: MP 30/5/1/2/3/2/1(304) EM, MP 30/5/1/2/2/304 MREA, 17/2/3 N-17, 17/2/3N-165), 17/2/3N-205), dated November 2019, which identifies non-compliances with the obligations of the Greenside EMPrs and EAs as indicated below:

- Aligned EMPr: failure to construct gabions or similar erosion control measures at the at the EWRP discharge point;
- Pollution Control Dam EMPr: No non-compliances were noted in respect of this EMPr;
- Amended EMPr (Thandeka Ventilation Shaft): No non-compliances were noted in respect of this EMPr;
- EIA and EMPr Amendment to include the Waterpan North area: No non-compliances were noted in respect of this EMPr;
- New Discard Facility (3A North Discard Dump) EIA and EMPr: No non-compliances were noted as the construction of the new discard facility had not yet commenced at the time of the audit;
- Discard Dump Retreatment Plant Basic Assessment and EMPr: No non-compliances were noted in respect of this EMPr;
- EA for the construction of the Pollution Control Dam: Administrative non-compliance pertaining to the date of issue of the authorisation not being present on the notification letter; failure to notify the Department 14 days in advance of the commencement of a construction activity and not notifying the Department within 24 hours of a non-compliance occurring;
- EA for the construction of the coal discard retreatment plant: No non-compliances were noted in respect of this EA; and
- EA for the proposed construction of a new Greenside discard dump and associated infrastructure to be located on Portions 0, 2 and 3 of the farm Groenfontein 331JS: No non-compliances were noted as the construction of the new discard facility had not yet commenced at the time of the audit.

The DMRE issued a pre-compliance notice to Greenside, dated 28 June 2019 (Reference No: MP/30/5/1/2/3/2/1/1 (304) EM following a site inspection on 21 and 4 June 2019. The pre-compliance notice was issued on the basis of Greenside's alleged:

- Disposal of hazardous waste to land (at the LHD Workshop next to Cairn Shaft) without a WML;
- Inadequate housekeeping at the LHD workshop including mixing of hazardous and general waste;
- Failure to manage/control stormwater at the No 4 Seam Plant; and
- Siltation of the dirty water diversion trenches around the co-disposal facility.

Greenside lodged representations to the DMRE in response to the pre-compliance notice 10 July 2019, indicating short term management actions intended to address the findings. According to discussions held with the Environmental Coordinator, the DMRE has not responded to the colliery's representation to the DMRE however the incidents pertaining to hazardous waste and general waste management have been addressed. With regard to the observation of the colliery's failure to manage/control stormwater at the No 4 Seam Plant, the Environmental Coordinator confirmed that the colliery is currently constructing a silt trap in the plant to address stormwater management and that an upgrade of the dirty water diversion trenches around the co-disposal facility is planned for 2022.

An External WUL Audit Report (Report Reference: ANG-COA-18-12-12) compiled by Shangoni and dated 14 January 2020, notes non-compliances with conditions of the Greenside WULs 04/B11G/AEGJ/1197, 04/B11G/G/2219, 04/B11G/CGI/3730 & 16/2/7/B100/C80, as indicated below:

WUL for Greenside Colliery (Licence Number: 04/B11G/AEGJ/1197):

- Failure to calibrate flowmeter devices on a biennial basis;
- Three non-compliances pertaining to exceedances in the volume of water abstracted from the No 2 Seam

underground to the specified in the conditions. According to the Auditor, an amendment to these volumes was requested from the DHSWS; however, it was not approved at the time of the audit;

- Lack of stop valves and taps at the sewage works which can be opened and closed using a loose wrench. The condition is considered impractical and an amendment to this condition was submitted to the DHSWS on 17 May 2019 according to the Auditor and it is presumed that no approval has been obtained;
- The disposal limit into Lake Lucy was exceeded for the audit review period;
- Non compliances to water quality limits for various parameters (Electrical Conductivity, Total Dissolved Solids (**TDS**), Calcium, Magnesium, Sodium, Chloride, Sulphate, and Manganese at all sites) at Pollution Control Dam (**PCD**) 3, Erickson Dam 1, Erickson Dam 2, Ericson Dam Shaft and Lake Lucy;
- Not all surface water monitoring points were being sampled – the colliery indicated that the monitoring points which were not sampled can no longer be sampled and have been replaced with alternative sampling points which have been communicated to the DHSWS. No approval on these changes has been received (at the time of the external audit). An additional non-compliance was noted for not obtaining approval from the Regional Head for changing the monitoring points;
- Exceedances in water quality limits at the two storm water monitoring points leaving the premises for TDS, Chloride, Sodium, Magnesium, Sulphates, Nitrates and Calcium. As a result of this, another non-compliance was issued for contaminated stormwater leaving the property;
- Lack of maintenance of the Y2K and Lake Lucy silt traps as well as in affected water trenches around the western and southern sites of the discard dump;
- The Rehabilitation Strategy and Implementation Plan (RSIP) was not updated within one year of the WUL being issued;
- Total Petroleum Hydrocarbon is required to be measured as part of the WUL conditions and this is not undertaken due to the cost involved. An amendment to the condition was submitted to the DHSWS on 17 May 2019;
- No GN704 exemption for Green Dam has been included in the WUL amendment; and
- Spillages from PCD 3 cannot be reclaimed whereas the condition requires this to take place.

PCD WUL for Greenside Colliery (Licence Number: 04/B11G/G/2219):

- Failure to calibrate flowmeter devices on a biennial basis;
- Not all surface water and groundwater monitoring points were being sampled – the Colliery indicated that the monitoring points which were not sampled can no longer be sampled and have been replaced with alternative sampling points which have been communicated to the DHSWS. No approval on these changes has been received (at the time of the external audit). An additional non-compliance was noted for not obtaining approval from the Regional Head for changing the monitoring points;
- The water monitoring plan as well as the storm water management plan was not submitted to the DHSWS within one month of issuance of the PCD WUL;
- Exceedances in water quality limits at monitoring points GCS11 and GCS12 downgradient of the 100 Ml Dam for all variables except pH;
- Total Petroleum Hydrocarbon is required to be measured as part of the WUL conditions and this is not undertaken due to the cost involved. An amendment to the condition was submitted to the DHSWS on 17 May 2019; and
- The PCD is situated within 100 m of a seep wetland for which no exemption to Regulation 4(a) of GN704 is available.

Retreatment Plant WUL for Greenside Colliery (Licence Number: 04/B11G/CGI/3730):

- Retreatment WUL was not audited as part of the 2018 internal audit;
- The 2018 EWULCA was not submitted to the DWS within 1 month of finalisation of the report; and
- No exemption to Regulation 4(a) of GN704 is available for the conveyor belt and the access road at Greenside.

3A North Discard Dump WUL for Greenside Colliery (Licence Number: 04/B11G/CGI/8851):

- The groundwater flow model report (Groundwater Complete, 2013) was not within six months of issuance of the exemption.

DHSWS has issued pre-directives to Greenside in terms of Section 19(3) and 53(1) of the NWA as indicated below:

*Pre-directive dated **28 January 2020** (Reference No: 04/B11G/AEGJ/1197, 04/B11G/G/2219)*

Issued following a site inspection on 14 November 2019 on the basis that:

- An NWA Section 21(g) water use has been undertaken without a WUL (Note: the nature of the activity is not specified in the pre-directive);
- Non-compliance with various WUL conditions for licenses 04/B11G/AEGJ/1197 and 04/B11G/G/2219;
- Failure to line and prevent siltation of Lake Lucy as well as the Y2K Dam;
- The Dust Suppression, Lake Lucy, Y2K and Ntshonalanga Dams are unauthorised; and
- Poor storm water management within the plant area.

Greenside submitted representations to DHSWS dated 21 February 2020, which indicates proposed rectification measures to address the findings of the pre-directive. At the time of writing this report and according to discussions held with the Environmental Coordinator on 8 October 2020, the colliery had not yet received a written confirmation of acknowledgement from the DHSWS. At the time of writing this report and according to discussions held with the Environmental Coordinator on 8October 2020 the colliery had not yet received a written confirmation of acknowledgement from the DHSWS.

*Pre-directive undated but **issued on 12 October 2015** (Reference 16/1/1/6/3/3, 16/1/1/6/3/6, 16/1/1/6/3/7, 16/1/1/6/3/9)*

Issued following a site inspection on 4 August 2015 on the following basis:

- Failure to authorise stockpiles as a Section 21(g) of the NWA;
- Failure to authorise undertaking dust suppression, which is a Section 21(g) water use activity;
- Failure to authorise discharging polluted storm water (containing oil/grease) through unlined channel into an unknown stream, which is a Section 21(f) and Section 21(g) water use activity;
- Impeding and diverting the flow of an unknown tributary, causing stagnation of the stream, which is a Section 21(c) and Section 21(i) water use activity;
- Construction of earth haul road within the unknown stream, which is a Section 21(c) and Section 21(i) water use;
- Placement of a skip outside the Sewage Treatment Plant, which is an unbunded area;
- Collection of seepage from the Discard Dump through a penstock into an unlined trench; and
- Erosion of waste rock material from the old Discard Dump into an unlined trench.

Greenside submitted representations to DHSWS dated 3 November 2015, which indicates proposed rectification measures to address the findings of the pre-directive. At the time of writing this report and according to discussions held with the Environmental Coordinator on 8 October 2020, the colliery had not yet received a written confirmation of acknowledgement from the DHSWS.

*Pre-directive dated **11 February 2015** (Reference: 04/B11G/AEGJ/1197)*

Issued following a site inspection on 23 January 2015 on the following basis:

- Failure to obtain a WUL for Sections 21(c), 21(f), 21(g) and 21(i) activities without a WUL; and
- Failure to comply with certain conditions of IWUL (Reference: 04/B11G/AEGJ/1197).

According to discussions held with the Environmental Coordinator, Greenside submitted representations to DHSWS, which indicate proposed rectification measures to address the findings of the pre-directive. At the time of writing this report and according to discussions held with the Environmental Coordinator on 8 October 2020, the colliery had not yet received a written confirmation of acknowledgement from the DHSWS.

A Social and Labour Plan (**SLP**) was prepared as part of the Greenside Mining Right Application (**MRA**) in terms of the requirements of the MPRDA. The SLP for the 2019 to 2023 period was submitted to the DMRE in February 2019; however, DMRE approval was not obtained at the time. An updated SLP for the 2019 to 2023 period was therefore submitted to the DMRE on 30 September 2020. Greenside submitted its Mining Charter scorecard report in March 2020 (AAC, 2020a) for the 2019 reporting year against the Mining Charter III requirements.

The sustainability review of Greenside considered external factors, internal factors and sustainability reporting practices. Systematic analysis of the available information indicated that external factors such as the macro-economic environment, the impact of climate change and sustainability reporting practices pose a moderate sustainability risk to the operation. Mitigation measures for sustainability reporting practices can be implemented through bringing the necessary skillsets on board on a site level. Internal factors which pose a high sustainability risk include – power supply (manufactured capital) and social license to operate (social and relational capital). Lack of local employment opportunities and follow through on human resource development (human capital) are considered to pose a moderate sustainability risk to the operations. These high and moderate risks could be mitigated through careful management plans and should not be left unattended.

ES22: Mine Closure and Liabilities

[SR1.7(i), SR5.2(ii)]

The closure liability has been assessed to ZAR554.9 million using the approach currently required by legislation and reported as the liability in December 2019, although we have not had proof that the cost has been approved and accepted by the DMR. SRK understands that a provision of ZAR598.4 million using a combination of contributions to Trust (ZAR362 million) and Bank Guarantees (ZAR236.2 million), has been made to the DMRE. SRK is of the opinion that Greenside has met its legal obligations around assessing and making provision for the liability. SRK is of the opinion that Greenside's assessment of liability based on commercial costs, which indicates a liability of ZAR440.6 million at end December 2019 (ZAR458.6 million at end December2020), is likely a more accurate reflection of liability as a more focussed approach has been used to determine this liability. There are potential risk items that could increase the closure liability, with these being additional covers required on the Greenside discard dump and the requirement to mitigate operational impacts of the Greenside discard dump on the shallow groundwater downstream of the dump. This could add additional costs that range between ZAR270 and ZAR420 million to the liability. SRK is of the opinion that Greenside has met statutory requirements and has a robust understanding of what the liability is, with future work required to refine the estimate as the end of LoM approaches.

The closure costing presented within this report is based on assessments undertaken in 2019. SRK understands that the Company is currently undertaking updates to the closure cost estimates for 2020. The costing models and reports are however, yet to be finalized, with completion only expected in November 2020. SRK understands that this review is wider than just updating models with new quantities and rates and includes a review of the closure cost assessment approach. SRK also understands that the 2020 update includes a review of post closure water management requirements and the technologies that may be required to manage post closure water make.

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of *December 2020.*

ES23: Water Management

[SR3.1(i), SR4.3(ii), SR5.2(ii) (vii) (viii)]

This section deals with the technical aspects of water management at Greenside, while Section ES 21 deals with the legal compliance aspects. However, this section does provide context and further information about the non-compliances, specifically related to GNR704.

Surface Water Management

A stormwater management strategy for Greenside was compiled in early 2020, following an audit by a consulting engineering company. It consists of an upgrade to Lake Lucy, and a pipeline to transfer water from Lake Lucy to the new pollution control dam, and rehabilitation of the Y2K Dam. However, until the strategy is fully implemented, Greenside remains non-compliant with GNR704.

The specific surface water risks are:

- If the Lake Lucy dam embankment fails, this will result in discharge of dirty water into the environment. This will in turn result in the contamination of surface and groundwater resources;
- In the event of a 1:50 year storm (or greater), dirty water from the dams and/or channels will be discharged to the environment. This will in turn result in the contamination of surface and groundwater resources; and
- Seepage of contaminated groundwater around the northern area of the discard dump poses a compliance and reputational risk.

Groundwater Management

The area is characterised by two major water-bearing zones; a shallow perched aquifer and a deeper fractured rock aquifer within the Karoo stratigraphy. The shallow aquifer is generally low yielding and the majority of groundwater users rely on the deeper fractured aquifer. Recharge to both aquifers is considered to be from rainfall. Groundwater flow is controlled by geological structures such as dykes, faults and contacts.

The regional groundwater levels vary from artesian conditions (zero metres below ground level (**mbgl**)) within the low-lying areas to 20 mbgl in the topographically elevated areas. Local groundwater levels within the Greenside area have been distorted by the mine dewatering. Groundwater levels in the underground mine workings clearly show a decline due to the ongoing groundwater abstraction. The identical trends in groundwater levels for the No 4 Seam and No 2 Seam indicate hydraulic interconnection between the two sets of mine workings.

Groundwater and surface water monitoring shows that the water downstream of the mining area has been impacted by mining activities, with elevated concentrations of sulphate and magnesium. The low pH values measured in some of the downstream boreholes and dewatering boreholes indicate acid rock drainage reactions.

It is SRK's opinion that the current dewatering strategy is sufficiently effective in maintaining groundwater levels below the current active No 4 Seam mine workings, for safe mining.

Elevated concentrations of sulphate and magnesium are expected within the mining area and the important factor is to ensure that water management is such that the affected water is not released into the receiving environment through discharge, decant or even plume movement.

The main concern therefore relating to groundwater is the post-mining decant of contaminated water, which may need treatment and management into perpetuity. If decanting occurs, pumping of water from the workings to the treatment plant will have to continue after cessation of mining.

Given the clear interconnection between the weathered and fractured aquifers, groundwater monitoring should be strictly adhered to and detailed records kept for groundwater abstraction from boreholes that pump from both aquifers.

ES24: Utilization and Marketing

[SR4.3(vi), SR5.6(ii)] [SV1.14]

The mine produces export-grade coal and is a function of the existing mine infrastructure and the inherent quality of the coal. The beneficiation plant on the mine is suited to a single stage wash product of higher-grade coal to maintain product quality control. There are some alternative domestic coal products that can be developed for domestic power stations, sourced from the mineral residue deposits. These are best marketed through third parties who can manage the risks better.

The API 4 price assessment is the benchmark price reference for coal exported from South Africa's Richards Bay Coal Terminal on a free on board (**FoB**) basis which satisfies the "RB1" product specification for a 6 000 kcal/kg product (minimum of 5 850 kcal/kg). Other coals commonly exported are the RB2 specification (minimum of 5 700 kcal/kg) and the RB3 specification (5 500 kcal/kg, minimum of 5 300 kcal/kg).

India is South Africa's main export market, accounting for about 57% of 2019 exports, with Pakistan a distant second. Exports made up 27% of South African coal sales in 2019.

Coals destined for use by Eskom made up 45% of coal sales in 2019 and generally have CV[1]s around 4 800 kcal/kg or 20 MJ/kg.

Coal is used in several different industries and applications, such as electricity generation, steel production, cement and paper production, converted into gas and liquid fuels, specialist products (e.g. activated carbon) and chemical products.

Historical export thermal coal prices FOB Richards Bay have varied since 2013 between USD50/t (Q1-2016) and USD100/t (Q3-2018). Domestic coal prices have varied between ZAR440/t (Q2-2015, Q2-2020) and ZAR620/t (Q4-2018).

The ZAR:USD exchange rate and API 4 coal price forecasts used in this CPR are taken from a market report prepared for the Company by Wood Mackenzie Ltd, as set out in Table ES-15.

Table ES-15: Forecast Exchange Rate and API Export Price (Real terms) (source: Wood Mackenzie)

Item	Units	2021	2022	2023	2024	2025	2026	2027	2028
Exchange Rate	(ZAR/USD)	16.24	15.58	14.99	13.75	13.75	13.75	13.75	13.75
API 4 Price	(USD/t)	85.2	82.4	80.7	79	79.3	79.4	79.5	81.1

Source: Wood Mackenzie (2021)

ES25: Material Contracts

[SV1.13] [SR5.6(ii)(vi)]

Transnet Freight Rail

The Company has a signed agreement with Transnet SOC Limited acting through its Transnet Freight Rail Division (**TFR**) for the transportation of coal to RBCT. The agreement commenced on 1 April 2014 and runs for ten years to 31 March 2024. The agreement can be extended by mutual agreement.

In terms of the contract, the contracted tonnage allocated to the Company is 19.08 Mtpa. The contract operates on a "take or pay" basis, except where the transport services offered by TFR exceed the contracted tonnage.

The annual rail tariff price escalation is based on:

- An index escalation based on a formula comprising PPI (64%), labour (22%), steel price (7%), electricity (5%) and diesel (2%); plus
- A capital related tariff adjustment (an adjustment based on the increase or decrease in actual Capex spent relative to the projections set out in TFR's feasibility study done at the time the agreement was signed.

The Company assigns the contracted TFR allocation to the various collieries depending on their requirements.

Greenside has historically used between 3.1 Mtpa and 3.7 Mtpa of this capacity.

The Company signed an agreement with SA Coal Mining Holdings Ltd (**SACMH**) for the lease of 500 kt (to the nearest train load) of TFR capacity for the period 27 January 2020 to 31 January 2021.

Richards Bay Coal Terminal

The Company was one of seven coal exporting companies that were involved in Phase 1 of the development of the Richards Bay Coal Terminal (**RBCT**). The Company participated in each phase up to and including the Quattro Optimisation Project in the process securing a linked entitlement of 20.88 Mtpa. This entitlement grants the Company six allocated grades of coal it can export and 16 allocated stockpiles.

RBCT operates on a commercial breakeven basis whereby it recovers its operating costs from the shareholders based on tonnages of coal exported. In terms of the shareholders' agreement, each shareholder is required on a "use or pay" basis to export a minimum annual tonnage of coal through the terminal based on its linked entitlement and committed annual tonnage usage (**CATU**). RBCT recovers its costs via a wharfage fee, which comprises an operating charge, an interest charge, a capital charge and a usage surcharge.

The Company leased of 500 kt of RBCT capacity from SACMH for the period 27 January 2020 to 31 January 2021. As part of the leased entitlement, the Company is assigned two 30 000 t stockpiles at RBCT.

Coal Marketing

The Company plans to enter into an exclusive offtake agreement with Anglo American Marketing Limited (**AAML**), whereby AAML will purchase all saleable export coal produced by the Company for an initial term of three years, calculated with effect from the listing date of the Company. It is further envisaged that the Company will conclude a domestic marketing agreement with AAML as well as a management services agreement in terms of which AAML can utilise any unused capacity on the Company's logistics (TFR/RBCT) channels.

The agreement will run for a further two years during which the Company may put its volumes out to tender provided that AAML has the right to match any offers received by the Company from third parties. Neither party will have a right to extend the agreement beyond this period.

The marketing fee payable to AAML will be a percentage of the realised price of the coal. The realised price of export coal will be the ruling price for Average Price Index (API4) coal less an adjustment for the actual calorific value (**CV**[1]**)** of the exported coal and a discount for the Ash content (as a USD/t).

The current arrangements between the Company and AAML are essentially the same as what are envisaged above.

Coal Supply Contract

The coal is supplied under an export contract that is normally based around a standard-type export contract that dictates supply price, qualities, etc. These contracts are normally based around delivery as free-on-board but in some cases, they can be concluded at different delivery points.

Provision of Services

Table ES1-16 shows the main contracts for the provision of supplies and services to the mine and their estimated annual value. The mine is an owner-operated colliery with the use of contractors for non-core operations. The colliery is managed within a portfolio of Company collieries and obtains some services from a Central Services Division; for example, training and medical services. The main supply commodities are not at risk from single sourcing and are competitively priced and managed through central purchasing contracts. The largest risk item (excluding the rail logistics) is the electricity supply; this is subject to security of supply issues, which are well managed through the contract and the supplier relationship.

Table ES-16: Greenside Colliery's Main Services Contracts

Contract	Estimated Annual Value (ZARm)
Joy/Sandvik Maintenance Contract	90
Power and Diesel Supply	12
Mining Supply:	
Roof bolts	15
Stonedust	5
Underground conveyor belts	28
Plant procurement	30
Equipment hire	30

ES26: Valuation Methods

[12.9(a)(i), 12.10(f)] [SV1.2, SV1.12, SV1.14]

The valuation of Greenside and the contained coal deposits has been prepared in accordance with the SAMVAL Code. The three generally accepted approaches to mineral asset valuation are:

- Income Approach - The Income Approach relies on the 'value-in-use' principle and requires determination of the present value of future cash flows over the useful life of the Mineral Asset;
- Market Approach - The Market Approach relies on the 'willing buyer, willing seller' principle and requires that the monetary value obtainable from the sale of the Mineral Asset is determined as if in an arm's-length transaction. The application of certain logic in Mineral Asset Valuation, such as 'gross in-situ value' simply determined from the product of the estimate of mineral content and commodity price(s), is considered unacceptable and inappropriate; and
- Cost Approach - The Cost Approach relies on historic and/or future amounts spent on the Mineral Asset, and is a valuation approach based on the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction.

SRK has valued Greenside utilizing the Market Approach and Income Approach.

ES27: Previous Valuations

[SV1.11]

SRK is not aware of any independent valuations for Greenside that have been published in the public domain in the previous two years.

ES28: Summary Valuation

[12.10(h)(xii)] [SR5.8(i)] [SV1.12, SV1.13, SV1.14, SV1.15]

The summary valuation for Greenside at the Valuation Date (which is also the Effective Date) is set out in Table ES-17. The values for Greenside were derived on a 100% basis and reflect SRK's preferred value derived from the Income and Market Valuation approaches. The value is intended to reflect the Market Value of the asset on a third party arms-length basis and no restriction were placed on the valuation. The effect of debt/loans and debt servicing was excluded in the compilation of the TEM used in the Income Approach valuation method.

Adjustments have been made in Table ES-17 for balance sheet items, which include cash on hand, medium and long-term borrowings (debt) and finished product inventories. The Company confirmed to SRK that there are no hedge or derivative contracts in force.

Entries in Table ES-17 were derived in ZAR terms and converted to USD terms at the exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

Table ES-17: Greenside Colliery Valuation as at 31 December 2020

Contract	Selected Value		The Company's Interest (%)	Fair Value to the Company	
	ZARm	USDm		ZARm	USDm
Greenside Colliery	3 335	226.8	100%	3 335	226.8
Sub-total	3 335	226.8	100%	3 335	226.8
Adjustments					
Cash on hand				0	0
Medium and long-term borrowings[1]				0	0
Finished product inventories[2]				191	13.0
Exploration budget costs				Included in cash flows	
Hedge contracts – mark to market				None in force	
Environmental liabilities				Included in cash flows	
Net Greenside Value				3 526	239.8

Notes:

1. Medium and long-term borrowings are intra-company amounts that will have no cash impact on Greenside.
2. Finished product inventories are valued by the Company at the lower of cost of net realisable value. The holding value of consumables and spares inventories has been excluded.

SRK repeated the construction of Table ES-17 using the selected minimum and maximum values derived from the Income and Market valuation approaches.

SRK considers that the fair value for Greenside after adjustment for balance sheet items is ZAR3 526 million (USD239.8 million), in the range of ZAR2 941 million (USD200.1 million) to ZAR3 941 million (USD268.1 million).

It should be noted that the valuation is very sensitive to the API4 coal price and USD:ZAR foreign exchange rate fluctuations. In addition, the market is currently volatile due to the COVID-19 epidemic.

ES29: Material Change

[12.10(b)] [SR4.1(iv), SR4.3(viii), SR5.3(iii), SR5.5(iii) (v)] [SV1.13]

The Company has observed a pronounced COVID-19-related impact on production at Greenside Colliery at the start of 2021. The Company has put in place several mitigation measures to claw back some of the production losses during 2021. However, due to ongoing concerns and uncertainties around the future impact of COVID-19, SRK has reduced the RoM and saleable production forecasts in 2021 by 5%. SRK views the downward revision for the purposes of this CPR is an appropriate measure to address the current uncertainty.

Should there be further COVID-19 infection peaks and associated lockdowns with a delayed vaccination roll-out, a similar 5% impact on 2022 forecast volumes may become necessary.

SRK has not taken into consideration the potential further impact of TFR shutdowns and/or rail constraints on sales.

Based on the information provided by the Company, no material changes are expected in the Coal Resource and Coal Reserve statements. Changes resulting from the COVID-19-related impacts are not expected to be material regarding the overall Coal Resource and Coal Reserve or the remaining LoM.

ES30: Risks

[12.10(h)(x)] [SR5.7(i)]

An iterative, integrated and collaborative risk assessment was carried out as part of the study to identify existing and potential vulnerabilities that could affect the project, using inputs from each of the project disciplines.

A total of 63 risks were evaluated across the disciplines; of those:

- 41 have a **low** residual rating;
- 16 have a **medium** residual rating;
- 6 have a **high** residual risk rating and

- 0 have an **extreme** residual risk rating.

The six risks that retained a high residual rating are:

i) Insufficient provision for closure due to the Clydesdale pan closure requirements not sufficiently designed;

ii) The magnetite supply becoming unavailable;

iii) Unreliable bulk power supply caused by load shedding with load curtailment for high power consumers;

iv) Subsidence from historical mining due to failure of underground pillars and/or extraction of underground pillars by illegal miners;

v) Lower revenue caused by a lower US dollar price; and

vi) Lower revenue caused by a stronger ZAR:US Dollar exchange rate.

Mitigation measures have been identified, as far as possible, and are considered essential in successfully managing the risk profile. A small number of risks are, however, are external and limited control can be applied to these (the ZAR:US Dollar exchange rate, for example). In this view, of 63 risks:

- 12 residual risks are considered to be **resilient;**
- 32 residual risks are considered to be **robust;**
- 17 residual risks are considered to be **temperate;** and
- 2 residual risks are considered to be **weak.**

ES31: Opportunities

[SR7.1(ii)]

The opportunities identified within Greenside's mining operation are:

- Cost saving opportunity to shut down the plant should it stay idle for more than 20 minutes to try and conserve energy. However, it is noted that this may inadvertently create the potential for copper theft to occur if the equipment is down, especially the overland conveyor. It is therefore recommended that the mine should consider installing security cameras (which are monitored remotely from the control room) to have visual monitoring of activities happening around the plant, especially the overland conveyor. The installation of security cameras – regardless of whether or not the plant is idle – has benefits.
- There may be an opportunity to implement energy efficiency programmes to try and offset the high power costs. In considering this opportunity, factors such as capital requirements and payback periods will need to be considered to determine if the projects will provide sufficient benefits.
- There is an opportunity to use contracts for successful and beneficial localised procurement.
- With regard to the EWRP:
  - A suitable and/or optimised mitigation strategy may be drawn up, following a formal analysis of the systemic issues to ensure that storage tanks/facilities do not overflow.
  - A response considering an event of unplanned, short-term, feed flow stoppage at the EWRP could be drawn up to include identifying buffer storage areas/facilities at each mine, where excess water could be stored temporarily in order to avoid complete disruption to the operation.

ES32: Concluding Remarks

[SR7.1(ii)] [SV1.13, SV1.0, SV1.10]

SRK has conducted a comprehensive review and assessment of all material issues likely to influence the future operations of Greenside based on information available up to 31 December 2020, which is the Effective Date and Valuation Date for this CPR. The CPR and Market Valuation of Greenside have been done according to the requirements of the SAMREC and SAMVAL Codes.

As far as SRK has been able to ascertain, the information provided by Greenside was complete and not incorrect, misleading or irrelevant in any material aspect. SRK has no reason to believe that any material facts have been withheld. SRK has reviewed the information provided by Greenside and is satisfied that the extent of the descriptions of various rights is consistent with the maps and diagrams received from the Company. Nevertheless, this does not constitute a legal due diligence and SRK does not make any claim or state any opinion as to the validity of the Company's title to the Mining Rights held or purported to be held over the Material Asset.

This report contains statements of a forward-looking nature which are subject to a number of known and unknown risks, uncertainties and other factors that may cause the results to differ materially from those anticipated in this report. The achievability of LoM plans, budgets and forecasts is neither assured nor guaranteed by SRK. The forecasts as presented and discussed herein have been proposed by the Company management and staff and have been reviewed and adjusted where appropriate by SRK. The projections cannot be assured as they are based on economic assumptions, many of which are beyond the control of the Company. Future cashflows and profits derived from such forecasts are inherently uncertain and actual results may be significantly more or less favourable. Nevertheless, SRK believes that the projections set out in this report should be achievable, provided that the required management resources and adequate capital necessary to achieve the projections are sustained.

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

In SRK's opinion, the fair value for Greenside after adjustment for balance sheet items is ZAR3 526 million (USD239.8 million), in the range of ZAR2 941 million (USD200.1 million) to ZAR3 941 million (USD268.1 million).

This Executive Summary is a true reflection of the full Competent Person's Report.

Lesley Jeffrey Pr.Sci.Nat. FGSSA
Principal Geologist & Competent Person
(SACNASP) (Coal Resources)
(SACNASP) (Lead Competent Person)

Norman McGeorge Pr Eng MSAIMM
Principal Mining Engineer & Competent Person
(ECSA) (Coal Reserves)

Andrew van Zyl FSAIMM, SAMVAL
Partner, Principal Consultant & Competent Valuator
(Valuation)

Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (**SRK)** by South African Coal Operations (Pty) Ltd (**SACO**). The opinions in this Report are provided in response to a specific request from the Company to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

Glossary of Terms, Abbreviations and Units

Term	Description
API4	API 4 price assessment is the benchmark price reference for coal exported from South Africa's Richards Bay Terminal and is used in physical and over-the-counter contracts
Beaufort Group	the uppermost division of the Karoo Supergroup consisting predominantly of mudstones
bituminous coal	a relatively soft coal containing a tarlike substance, bitumen, that is the most abundant type of coal
bord and pillar	a mining method to extract the coal by excavating roadways (bords) in a checkerboard fashion through a block of coal and leaving pillars of coal behind to support the overlying strata
borehole	a term used exclusively to describe a deep, narrow hole drilled to access subterranean water
calorific value	calorific value is the amount of chemical energy stored in a coal that is released as thermal energy upon combustion
capacity building	activities and initiatives that enhance the knowledge and skills of people, improve the structure and processes so that communities could constantly grow and develop
carbonaceous	containing carbon
clastic	rock or sediment composed of clasts which have been transported from their place of origin, e.g. sandstone and shale
clean water	water that does not contain waste, e.g. natural catchment runoff, as per the definitions in GNR704
conformable	referring to strata in which layers are formed above one another in an unbroken, parallel order
cumulative impact	the cumulative impact of the project is the incremental impact of the project when added to impacts from other relevant past, present and reasonably foreseeable developments, as well as unplanned but predictable activities enabled by the project that may occur later or at a different location Cumulative impacts can result from individually minor but collectively significant activities taking place over a period of time The environmental and social assessment will consider cumulative impacts that are recognized as important on the basis of scientific concerns and/or reflect the concerns of project-affected parties The potential cumulative impacts will be determined as early as possible, ideally as part of project scoping
decline	the main tunnel from surface down into the mine, which normally supports the coal clearance conveyor, men and material access and ventilation
deltaic	adjective referring to river delta
diamictite	type of lithified sedimentary rock that consists of non-sorted to poorly sorted terrigenous sediment containing particles that range in size from clay to boulders, suspended in a matrix of mudstone or sandstone
dip	the inclination of a planar surface, measured in the vertical plane perpendicular to its strike
dirty water	water containing waste, e.g. runoff from mining plant areas, as per the definitions in GNR704
discard	the coal remaining after beneficiation that cannot be sold
dolerite	igneous rock formed below the Earth's surface, a form of basalt, containing relatively little silica (mafic in composition)
drill hole	method of sampling rock that has not been exposed
Dwyka Group	glacial Permian deposit that is widespread in South Africa
dyke	thin, tabular, vertical or near vertical body of igneous rock formed by the injection of magma into planar zones of weakness
Ecca Group	the Ecca Group is divided into three groups: the Lower Ecca (containing almost 300 metres of shales), the Middle Ecca (some 500 metres of sandstone, seams of coal, and fossilized plants), and the Upper Ecca (about 200 metres of shales)
fluvial	refers to the processes associated with rivers and streams and the deposits and landforms created by them
fluviodeltaic	sediment transported and deposited by rivers, coupled to a subaqueous delta, where transport and deposition occur via slope failure (avalanching), settling of fine-grained sediments from suspension in the water column and deposition of sediment by wind and tide generated currents
geophysical	quantitative observation of the physical properties of the deposit
geotechnical	geotechnical engineering is the branch of civil engineering concerned with the engineering behaviour of earth materials
Gondwana	a previous southern super-continent, comprising Africa, Madagascar, India, Sri Lanka, Australia, Antarctica and South America, which split about 180 million years ago

Term	Description
gritstone	a hard, coarse-grained sandstone
Karoo Supergroup	a sequence of mostly nonmarine units deposited between the Late Carboniferous and Early Jurassic periods
lithological	the gross physical character of a rock or rock formation
matrix	the fine-grained material separating the clasts in a sedimentary rock
Mining Charter	a Charter to facilitate the sustainable transformation and development of the South African mining industry
mudstone	a clastic sedimentary rock with particles of mud size
percussion drilling	a coal intermediate between anthracite and bituminous coal
Permian period	the geologic period from 298.9 to 251.902 million years ago
pre-Karoo	igneous, sedimentary or metamorphic rocks predating Dwyka glaciation and forming the basement underlying the Karoo Supergroup
quartzite	metamorphic rock formed by the alteration of sandstone by heat, pressure and chemical activity
rank	the degree of coalification of a coal
RB1	the Richards Bay free-on-board price for a 6 000 kcal/kg product (minimum of 5 850 kcal/kg)
RB2	the Richards Bay free-on-board price for a minimum of 5 700 kcal/kg
RB3	the Richards Bay free-on-board price for a 5 500 kcal/kg product (minimum of 5 300 kcal/kg)
right-lateral displacement	displacement along a strike-slip fault where the ground on the opposite side of the fault to the viewer has moved to the right
roof	the strata immediately above a coal seam
sandstone	a clastic sedimentary rock with >25% of clasts of sand by volume
seam	defined layers of rock / sand
sedimentary	pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks
shale	fine-grained sedimentary rock whose original constituents were clay minerals or muds
sill	a thin, tabular, horizontal to sub-horizontal body of igneous rock
silt	a sediment whose particles have a size range of 4 – 625 microns
siltstone	a clastic sedimentary rock with particles of silt size
stakeholder/s	a person or group of people who may be exposed to positive or negative impact of financial, safety, environmental and social aspects of company operation as well as those who show interest in the company or influence it
stakeholder engagement	Communication / exchange of information with interested parties (using various means) to identify priorities in social and environmental issues in order to improve the decision-making process and implementation of these decisions in the company
strata	a layer of material, naturally or artificially formed, often one of a number of parallel layers one upon another
stratigraphy	study of stratified rocks in terms of time and space
strike	the direction of a horizontal straight line constructed on an inclined planar surface , at a direction of 90° from the true dip direction
strike-slip fault	a fault where the displacement is parallel to the strike of the displacement plane
strip ratio	the measure of waste material moved in bank cubic metres in order to expose one tonne of coal in an open pit
tillite	coarsely graded and extremely heterogeneous sediments of glacial origin
UK Prospectus Regulation Rules	UK Prospectus Regulation Rules made by the FCA, pursuant to Section 73A (4) of the FSMA
varve	a sedimentary bed, layer, or sequence of layers deposited in a body of still water within a year or season Also known as glacial varve
volatile matter	the components of coal (except for moisture) which are liberated at high temperature in the absence of air, consisting of hydrocarbons and some sulphur
Vryheid Formation	the main coal-bearing unit of the Karoo Supergroup, consisting mostly of interbedded sandstones, shales, mudstones and coal seams
Witbank Coalfield	a coalfield in Mpumalanga east of Pretoria

Abbreviation	Description
2015 Provisioning Regulations	Section 24P of NEMA and the Financial Provisioning Regulations, 2015
2019 Provisioning Regulations	Section 24P of NEMA and the Financial Provisioning Regulations, 2019
AAC	Anglo American Coal
AAC SRD	Anglo American Coal Standard(s) and Requirements Document
AAIC	Anglo American Inyosi Coal (Pty) Ltd
AAML	Anglo American Marketing Ltd
AASW	Anglo American Social Way
ACGS	Anglo American Geological Services
adb	air-dried basis
adc	air-dried contaminated basis
AEL	Atmospheric Emission Licence
Africa Lime	Africa Lime Industries (Pty) Ltd
AOPL	Anglo Operations (Pty) Ltd
ar	As received
BAP	Biodiversity Action Plan
B-BBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
BV	Bureau Veritas (Pty) Ltd
CAGR	compound annual growth rate
Capex	capital expenditure estimates
CATU	Committed Annual Tonnage Usage
CCR	Central Control Room
CCS	Consequence Classification Structure
CDP	Carbon Disclosure Project
CESR	Committee of European Securities Regulators
CIT	Corporate Income Tax
CM	Continuous Miner
COAD	Chronic Obstructive Airway Disease
CoP	Code of Practice
CP	Competent Person
CPR	Competent Person's Report
CTA	Carbon Tax Act (2019)
CTC	Colliery Training College
CV[1]	calorific value
CV[2]	Competent Valuator
CWP	Coal Workers Pneumoconiosis
DAFV	dry ash-free volatiles
DCF	Discounted Cash Flow
DEA	Department of Environmental Affairs
DEFF	Department of Environment, Forestry and Fisheries (as of 29/05/2019)
DHSWS	Department of Human Settlements, Water and Sanitation (as of 29/05/2019)
DME	Department of Minerals and Energy (now called DMRE)
DMR	Department of Mineral Resources (now called DMRE)
DMRE	Department of Mineral Resources and Energy (as of 29/05/2019)
DOH	Direct Operating Hours
DPM	Diesel Particulate Matter
DTI	Department of Trade and Industry
DTM	Data Terrain Model
DWA	Department of Water Affairs (now called DHSWS)
DWS	Department of Water and Sanitation (now called DHSWS)
EA	Environmental Authorisation
EC	Electrical Conductivity
ECA	Environmental Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
ECSA	Engineering Council of South Africa
EE	Economic Empowerment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme Report (after 8/12/2014, under NEMA)
EMPR	Environmental Management Programme Report (before 8/12/2014, under the MPRDA; now called EMPr)
EMS	Environmental Management System

Abbreviation	Description
Environmental Minister	The Minister for Environment, Forestry and Fisheries
ESD	Enterprise and Supplier Development
ESG	Environmental and Social Governance
Eskom	Eskom Holdings SOC Limited
ESMA	European Securities and Markets Authority
ESOP	Employee Share Ownership Plan
EWRP	eMalahleni Water Reclamation Plant
FC	fixed carbon
FCA	Financial Conduct Authority
FoB	Free on Board (on ship)
FoR	Free on Rail
FSMA	Financial Services and Markets Act (2000) (UK)
GAR	Greenside Area of Responsibility
GCHP	Ground Control Hazard Plan
GFSA	Gold Fields of South Africa
GHG	Greenhouse Gas
GIMS	Geological Information Management System
Glencore	Glencore Operations SA
GN1147	Financial Provisioning Regulations, 2015 GNR.1147
GNR	Government Notice Regulation
Golder	Golder Associates Africa (formerly Golder Associates)
GSSA	Geological Society of South Africa
HDP	Historically Disadvantaged Persons
HDPE	High-density polyethylene
HDSA	Historically Disadvantaged South African
HR	Human Resources
HRD	Human Resource Development
IDP	Integrated Development Plan
IFC	International Finance Corporation
IIRF	International Integrated Reporting Framework
IM	inherent moisture
IRP	Integrated Resource Plan
ISO	International Organization for Standardization (ISO/IEC 17025:2017)
IWUL	Integrated Water Use Licence
JSE	JSE Ltd
KPI	Key Performance Indicator
LED	Local Economic Development
LHD	Load Haul Dump
LIMS	Laboratory Information Management System
LoM	Life-of-Mine
LRA	Labour Relations Act (Act 66 of 1995)
LSE	London Stock Exchange
LTI	Lost Time Injury
LTIFR	Lost Time Injury Frequency Rate
mamsl	metres above mean sea level
mbgl	Metres below ground level
MBSP	Mpumalanga Biodiversity Sector Plan
MCC	Motor Control Centre
MCI	Mining Charter (1st iteration, 2004)
MCII	Mining Charter (2nd iteration, 2010)
MCIII	Mining Charter (3rd iteration, 2018)
MHSA	Mine Health and Safety Act, (Act 29 of 1996) and amendments
MOU	Memorandum of Understanding
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MPTRO	Mineral and Petroleum Titles Registration Office
MQA	Mining Qualifications Authority
MR	Mining Right
MRA	Mining Right Application
MRD	Mineral Residue Deposit
MTIS	Mineable Tonnes *In situ*
MWP	Mine Works Programme
NEM:AQA	National Environmental Management: Air Quality Act (Act 39 of 2004)

Abbreviation	Description
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003)
NEM:WA	National Environmental Management: Waste Act (Act 59 of 2008)
NEM:WAA	National Environmental Management: Waste Amendment Act (Act 26 of 2014)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMLAA4	National Environmental Management Laws Amendment (Act 4) Bill
NERSA	National Energy Regulator of South Africa
NFA	National Forests Act (Act 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NGER	National Greenhouse Gas Emission Reporting Regulations
NHRA	National Heritage Resources Act (Act 25 of 1999)
NIHL	Noise-Induced Hearing Loss
NMD	Notified Maximum Demand
No 1 Seam	Number 1 Seam
No 2 Seam	Number 2 Seam
No 3 Seam	Number 3 Seam
No 4 Seam	Number 4 Seam
No 5 Seam	Number 5 Seam
NOMR	New Order Mining Right
NPV	Net Present Value
NWA	National Water Act (Act 36 of 1998)
OEL	Occupational Exposure Limit
OES	One Environment System
Opex	operating expenditure estimates
P1	Number 1 Seam parting (separates S1 and S2 seams)
P2	Number 2 Seam parting (separates S2S and S2T coal)
P4	Number 4 Seam parting (separates S4T and S4S coal)
P4L	Number 4 Seam parting (separates S4L and S4S coal)
PAR	Performance Assessment Review
PCD	Pollution Control Dam
PDS	Proximity Detection System
plc	Public Limited Company
PoO	Point of Observation
PS	Performance Standard
Ptn	Portion
QA/QC	Quality Assurance/Quality Control
R&R	Coal Resources and Coal Reserves
RBCT	Richards Bay Coal Terminal
RD	relative density
Resources Minister	The Minister of Mineral and Petroleum Resources Development
RLT	Rail Load-out Terminal
RMD	Roof Monitoring Devices
RoM	Run-of-Mine
Royalty Act	Mineral and Petroleum Resources Royalty Act (Act 28 of 2008)
Royalty Bill	Mineral and Petroleum Resources Royalty Bill (2008)
RPEEE	Reasonable Prospects for Eventual Economic Extraction
RRT	Red Response Team
RSRD	Residue Stockpiles and Residue Deposit
Rsv	Coal Reserves
RWD	Return Water Dam
S&D	Stripping and Development
S2	Number 2 Seam (full seam - S2S and S2T)
S4A	Number 4 Seam Upper split
S4L	Number 4 Seam Lower
S4M	Number 4 Seam Select mining height
S4RC	Number 4 Seam Roof Coal
S4S	Number 4 Seam Select
S4T	Number 4 Seam Top
S4TC	Number 4 Seam Top Coal
S4U	Number 4 Seam Upper
SABS	South African Bureau of Standards
SACE	South African Coal Estates

Abbreviation	Description
SACNASP	South African Council for Natural Scientific Professions
SACO	South Africa Coal Operations (Pty) Ltd
SACMH	SA Coal Mining Holdings Ltd
SAEC	South African Energy Coal Ltd
SAIMM	Southern African Institute for Mining and Metallurgy
SAMESG Guideline	South African Guideline for the Reporting of Environmental, Social and Governance Parameters within the Mining and Oil and Gas Industries (2017 Edition)
SAMREC	South African Mineral Resource Committee
SAMREC Code	The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (The SAMREC Code), 2016 Edition
SAMVAL	South African Mineral Asset Valuation Committee
SAMVAL Code	The South African Code for the Reporting of Mineral Asset Valuation (The SAMVAL Code), 2016 Edition
SANAS	South African National Accreditation System
SANS 10320:2004	South African National Standard 10320: *"The South African guide to the systematic evaluation of coal resources and coal reserves"* 1st Edition
SANS 10320:2020	South African National Standard 10320: *"The South African guide to the systematic evaluation of coal exploration results, coal resources and coal reserves"* 2nd Edition
SEAT	Socio-Economic Assessment Toolkit
SEP	Stakeholder Engagement Plan
SIB	Stay in Business
SIMMS	Structural Inspection and Maintenance Management System
SLA	Service Level Agreement
SLP	Social and Labour Plan
SRK	SRK Consulting (South Africa) (Proprietary) Limited
SRK Work Products	SRK work product or other deliverable (including reports, analysis, opinion or similar)
SSC	SAMCODES Standard Committee
TARP	Trigger Action Response Plan
TDS	Total Dissolved Solids
TEM	techno-economic model
TEPs	techno-economic parameters
THT	Train handling time
TMM	Trackless Mechanised Mining
TS	total sulphur
UG	underground
UKLA	UK Listing Authority
UKLA Listing Rules	Listing Rules LR13.4.6
USBM	United States Bureau of Mines
UKLA Listing Rules	Listing Rules LR13.4.6
VAT	Value Added Tax
VCB	Vacuum Circuit Breaker
VM	volatile matter
WACC	Weighted Average Cost of Capital
Water Minister	The Minister of Water, Human Settlements and Sanitation
WCS	Working Cost Spares
WHO	World Health Organisation
WMA	Water Management Area
WML	Waste Management Licence
WUL	Water Use Licence
WULA	Water Use Licence Application
WW	Webber Wentzel Attorneys

Unit	**Description**
°	a degree
'	a minute
"	a second
%	percentage
cm	a centimetre
g/cm^3	grammes per cubic centimetre
ha	a hectare (10 000 m^2)
kcal	a thousand calories
kcal/kg	a thousand calories per kilogram
kg	a kilogramme
kg/m^3	kilograms per cubic metre
kg/t	kilograms per tonne
km	a kilometre (one thousand metres)
kt	a kilotonne (one thousand metric tonnes)
ktpa	a thousand metric tonnes per annum
ktpm	a thousand metric tonnes per month
kV	a thousand volts
kVA	a thousand volt amperes
kVAR	kilo-Volt Ampere Reactive
kW	A kilowatt (one thousand watts)
kWh	a kilowatt-hour
l/min	litres per minute
m	a metre
mØ	a metre diameter
m^2	a square metre
m^3	a cubic metre
Ma	a million years ago
mamsl	metres above mean sea level
mbgl	metres below ground level
MJ/kg	megajoules per kilogram
Ml/d	megalitres per day
mm	a millimetre
Mm^3	a million cubic metres
MPa	a megapascal (one million pascals)
Mt	a million metric tonnes
Mtpa	a million metric tonnes per annum
MVA	a million volt amperes
t	a metric tonne
tph	metric tonnes per hour
TWh	a terawatt hour
USD	United States Dollar
USDm	a million United States Dollars
USD/t	United States Dollar per tonne
V	a volt
Y%	mineral royalty percentage rate
ZAR	South African Rand
ZARm	a million South African Rand
ZAR/kg	South African Rand per kilogram
ZAR/t	South African Rand per tonne

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1. Introduction

1.1. Background

[12.10(h)(i)] [SR1.1(i), SR7.1(i)] [SV1.3, SV1.4, SV1.5]

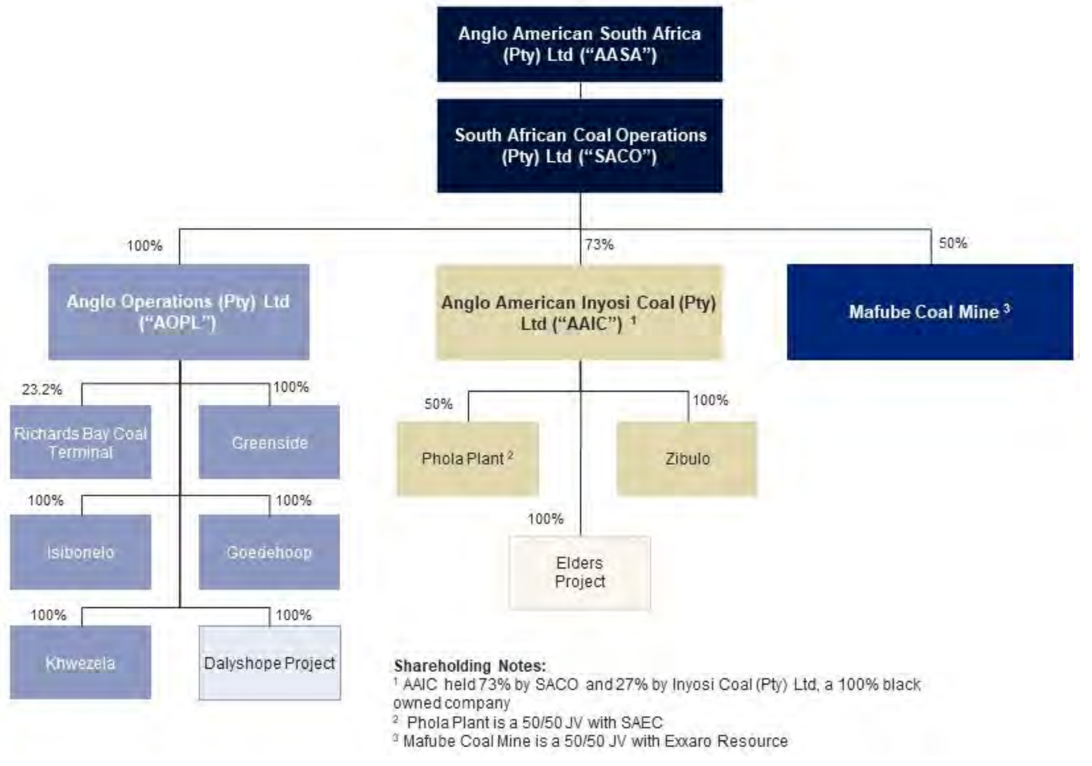
SRK Consulting (South Africa) (Pty) Ltd (**SRK**) was commissioned by South Africa Coal Operations (Pty) Ltd (**SACO**), to compile a Competent Person's Report (**CPR**) on Greenside Colliery (**Greenside**) in Mpumalanga, South Africa. The Anglo American Group will be separating its South African thermal coal operations, which comprise the operations held by SACO, by way of a demerger ("**Demerger**") and the transfer of such operations to Thungela Resources Limited (the **Company**). The Company is incorporated in South Africa and all of the issued, and to be issued, Shares of the Company are expected to be admitted to the main board of the JSE Limited (**JSE**) as a primary listing and admitted to the standard listing segment of the UK Official List and to trading on the main market for listed securities on the London Stock Exchange (**LSE**). Any reference to the Company in this report should be read to also include SACO, as relevant.

1.1.1. Ownership

[12.10(h)(iii)] [SR1.5(i) (ii)] [SV1.2] [ESG4.1]

SACO holds a 100% indirect interest in the Greenside coal operations as shown in the proposed corporate structure (Figure 1-1), located approximately 15 km southwest of eMalahleni (previously known as Witbank) in Mpumalanga Province (Figure 1-2).

Greenside is an underground operation complete with a coal processing facility.



srk consulting

GREENSIDE COLLIERY CPR
Illustrative Existing Group Structure and Interests in Coal Assets *(Source: pers. comm. Harding, C., 2021)*

Project No. 566644

Figure 1-1: Illustrative Existing Group Structure and Interests in Coal Assets

1.2. Terms of Reference, Reporting Compliance and Sources of Data

[12.10(h)(i)] [SV1.2, SV1.3]

1.2.1. Purpose of Report

[12.10(h)(i), SR1.1(i), SV2.2]

This report has been prepared by SRK for inclusion in the pre-listing statement and prospectus, or similar (**Listing Documentation**) to be published by the Company in connection with the Demerger and the proposed admission of the Company's issued and to be issued ordinary shares to

- Trading on the "Mining" sector of the JSE as a primary listing;
- The standard listing segment of the UK Official List; and
- Trading on the LSE's Main Market for listed securities (the **Offer**).

This report, which summarises the findings of SRK's review, has been prepared to satisfy the requirements of:

- A Competent Person's Report as set out in Chapter 12 of the Listing Rules of the JSE (the **JSE Rules**) and follows the form and content of a Mineral Asset Valuation Report as specified by the 2016 Edition of "*The South African Code for the Reporting of Mineral Asset Valuations"* (the **SAMVAL Code**); and
- The requirements of the UK Prospectus Regulation Rules made by the Financial Conduct Authority (**FCA**) pursuant to Section 73A (4) of the Financial Services and Markets Act 2000 (**FSMA**) (**UK Prospectus Regulation Rules**) and the UK version of Regulation (EU) 2017/1129) of the European Parliament and of the Council of 14 June 2017 and repealing Directive 2003/71/EC and the delegated acts, implementing acts and technical standards thereunder as such legislation forms part of retained EU law by virtue of the European Union (Withdrawal) Act 2018, in conjunction with the European Securities and Markets Authority (**ESMA**) update of the Commission of European Securities Regulators (**CESR**) recommendations for the consistent implementation of the European Commission's Regulation on Prospectuses No 809/2004 (CESR/05-054b) issued (**ESMA Recommendations**), specifically, Clauses 131 to 133 and Appendices I and II.

SRK has given and has not withdrawn its written consent to:

(i) The issue of the Listing Document with the inclusion of the references to its name; and

(ii) The inclusion of information extracted from this CPR in "Part VIII—Business Overview" of the Listing Document, and has authorised the contents of this CPR and references thereto as part of the Listing Document for the purposes of Item 1.3 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018.

In compliance with Item 1.2 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018, SRK accepts responsibility for this CPR and, to the best of SRK's knowledge, declares that the information set out in this CPR is in accordance with the facts and this CPR makes no omission likely to affect its import.

1.2.2. Reporting Compliance

[12.10(e)] [SV1.0, SV1.4]

SRK has reviewed the practice and estimation methods undertaken by the Company and is of the opinion that they are in compliance with the JSE Rules and the South African Mineral Resource Committee (**SAMREC**) and South African Mineral Asset Valuation Committee (**SAMVAL**) Codes, as well as the UKLA Listing Rules, Prospectus Rules, Prospectus Directive and ESMA update of the CESR Recommendations. In this report, all Coal Resources have been substantiated by evidence obtained from SRK's site visits and observation, and are supported by details of exploration results, analyses and other evidence supplied by the management of the Company and its subsidiaries.

The reporting standard adopted for the reporting of the Coal Resources and Coal Reserves for Greenside is the 2016 Edition of "*The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves"* (The **SAMREC Code**) as prepared by the South African Mineral Resource Committee Working Group under the auspices of the Southern African Institute for Mining and Metallurgy (**SAIMM**) and the Geological

Society of South Africa (**GSSA**). The definitions of the relevant terms, methodologies and estimation processes employed and the reporting for South African Securities Exchange purposes for the Coal Resources and Coal Reserves in this report are according to those set out in the *"The South African -guide to the systematic evaluation of coal exploration results, coal resources and coal reserves"* (**SANS 10320:2020**) published by Standards South Africa, a division of the South African Bureau of Standards (**SABS**).

The reporting standard adopted for the reporting of the valuation for Greenside is the SAMVAL Code, as prepared by the South African Mineral Asset Valuation Working Group under the auspices of the SAIMM and the GSSA.

This report also satisfies the disclosure requirements of *"The South African Guideline for the Reporting of Environmental, Social and Governance Parameters within the Solid Minerals and Oil and Gas Industries"* (the **SAMESG** Guideline).

SRK confirms that this CPR complies with the disclosure and reporting requirements of the JSE Rules, SAMREC and SAMVAL Codes (together the "**Codes**"), the UKLA Listing Rules as well as clause 133 and Appendix II of the ESMA update of the CESR Recommendations.

This report has been prepared under the direction of the Competent Persons (**CP**s) and Competent Valuator (**CV^2**) in accordance with the requirements of the SAMREC and SAMVAL Codes and the SAMESG Guideline (**SAMESG**), who assume overall professional responsibility for the document. SRK confirms that the staff employed to compile this CPR satisfy the requirements of CP and CV^2 as set out by the Codes. Note that two "CV" abbreviations have been used throughout this document:

- CV^1 for "Calorific Value"; and
- CV^2 for "Competent Valuator.

A shorthand notation has been adopted to demonstrate compliance with the JSE Rules and disclosure requirements of the SAMREC (**SR**) and SAMVAL (**SV)** Codes and SAMESG Guideline (**ESG**), for example:

- [12.10(d)] represents section 12.10(d) of the JSE Rules;
- [SR1.1] represents item 1.1 - Property Description of Table 1 of the SAMREC Code;
- [SV1.4] represents criterion T1.4 - Compliance of Table 1 in Appendix A of the SAMVAL Code; and
- [ESG2.3] relates to Item 2.3 included in the SAMESG Guideline.

The shorthand notation is included under all section headings, as relevant, to indicate what compliance aspects that section is addressing. Summary tables showing compliance to Chapter 12 of the JSE Listing Rules, SAMREC/SAMVAL Codes and SAMESG Guidelines are included at the end of this report (Appendices 4 to 6).

1.2.3. Sources of Data

[SV1.19]

Details of the information used to prepare this report are:

- Electronic information received from the Company's Greenside Box (Data Room); and
- Discussion with the relevant Company staff members at the operation and at the Company's head office.

1.3. Reporting Standard, Reliance

1.3.1. Reporting Standard

[12.9(a)(i), 12.10]

The reporting standard adopted for the reporting of the Coal Resources and Coal Reserves for Greenside is the SAMREC Code (2016 Edition) as prepared by the South African Mineral Resource Committee Working Group under the auspices of SAIMM and the GSSA through the SAMCODES Standard Committee (**SSC).** The SAMREC Code is an international reporting code that is acceptable to the JSE Listing Rules [Chapter 12].

The reporting standard adopted for the reporting of the value for Greenside is the SAMVAL Code (2016 Edition) as prepared by the South African Mineral Asset Valuation Committee Working Group under the auspices of the SAIMM and the GSSA through the SSC.

1.3.2. Reliance on SRK

[SR9.1(i)] [SV1.0]

This CPR is addressed to and may be relied upon by the Company, the Directors of the Company and the Company's various financial, legal and accounting advisors (the **Advisors**) in support of the Proposed Transaction, specifically in respect of compliance with the requirements of the Listing Rules and the Codes. SRK agrees that the CPR may be made available to and relied upon by the Advisors.

SRK is responsible for the CPR and for all the technical information contained therein. SRK declares that it has taken all reasonable care to ensure that this CPR and the technical information contained therein is, to the best of its knowledge, in accordance with the facts and makes no omission likely to affect its import.

SRK confirms that the presentation of technical information contained elsewhere in the Listing Documentation released by the Company which relates to information in the CPR is accurate, balanced and not inconsistent with the CPR.

SRK believes that its opinion should be considered as a whole and selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in this CPR. The preparation of a CPR is a complex process and does not lend itself to partial analysis or summary.

SRK has no obligation or undertaking to advise any person of any development in relation to Greenside which comes to its attention after the date of the CPR or to review, revise or update the CPR or opinion in respect of any such development occurring after the date of the CPR.

1.4. Effective Date and Valuation Date

[12.10(a)] [SR9.1(iii)] [SV1.2, SV1.13]

The Effective Date for this CPR is 31 December 2020 (the **Effective Date**).

The Coal Resource and Coal Reserve statements set out in this CPR are reported as at 31 December 2020 and represent the Coal Resources and Coal Reserves at the Effective Date as audited by SRK.

The declaration of Coal Reserves as at the Effective Date of 31 December 2020 includes a forecast of four months (September to December 2020) to the allocated position. However, information gained during the review is that Greenside has not achieved its planned production targets during the first six months of 2020. It is SRK's opinion that any variation between the planned and the actual Coal Reserves will not be significant.

The LoM plan and associated technical and economic parameters (**TEPs**) included in the LoM plan and techno-economic model (**TEM**) all commence on 1 July 2020 and are presented in constant money terms (cost estimates are at the Effective Date and ignore inflation and any real increase due to escalation).

The financial results for Greenside are taken to be correct at 31 December 2020, the Effective Date of the CPR, which is also the **Valuation Date**.

1.4.1. Material Change

[12.10(b)] [SR4.1(iv), SR4.3(viii), SR5.5(iii)] [SV1.13]

The valuation of Greenside is correct at 31 December 2020, the Valuation Date.

The Company has observed a pronounced COVID-19-related impact on production at Greenside Colliery at the start of 2021. The Company has put in place several mitigation measures to claw back some of the production losses during 2021. However, due to ongoing concerns and uncertainties around the future impact of COVID-19, SRK has reduced the RoM and saleable production forecasts in 2021 by 5%. SRK views the downward revision for the purposes of this CPR is an appropriate measure to address the current uncertainty.

Should there be further COVID-19 infection peaks and associated lockdowns with a delayed vaccination roll-out, a similar 5% impact on 2022 forecast volumes may become necessary

SRK has not taken into consideration the potential further impact of TFR shutdowns and/or rail constraints on sales.

No material changes are expected in the Coal Resource and Coal Reserve statements. Changes resulting from the COVID-19-related impacts are not expected to be material regarding the overall Coal Resource and Coal Reserve or the remaining LoM.

1.4.2. Units and Currency

Throughout this report, SRK has used the International System of units. All units used in the CPR are defined in the glossary of terms.

All monetary values used in this CPR are expressed in 2020 constant money terms in South African Rand (**ZAR**).

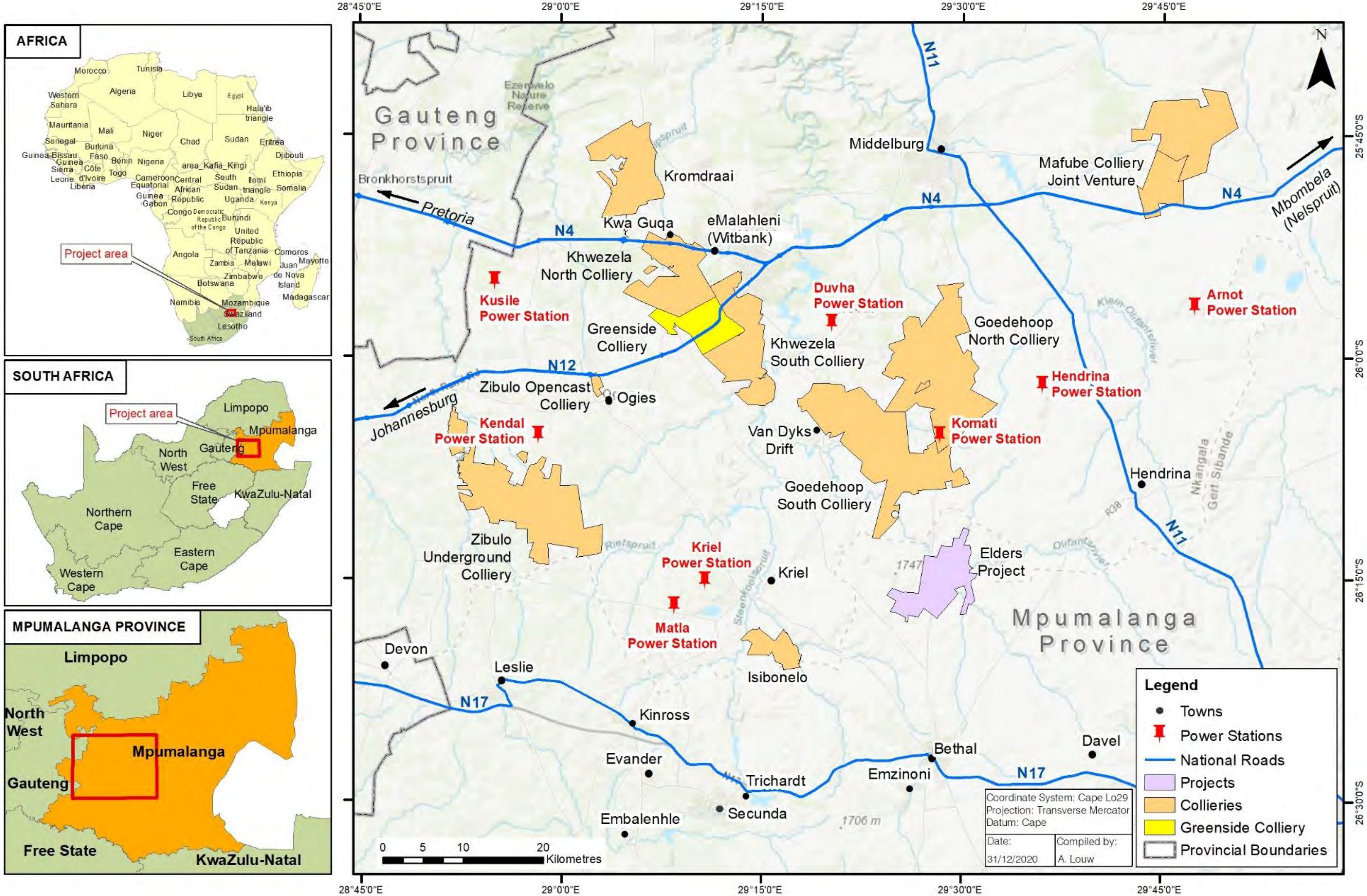
1.4.3. Sufficiency of Rehabilitation Funding

[SR1.7(i)]

The closure liability has been assessed to ZAR554.9 million using the approach currently required by legislation. SRK understands that a provision of ZAR598.4 million has been made to the Department of Mineral Resources and Energy (**DMRE**) using a combination of Trust Funding (ZAR362.2 million) and Bank Guarantees (ZAR236.2 million). SRK is of the opinion that Greenside has met its legal obligations around assessing and making provision for the liability. SRK considers that the Greenside assessment of liability based on commercial costs, which indicates a liability of ZAR440.6 million at end December 2019 (ZAR458.6 million at December 2020), is likely to be a more accurate reflection of liability as a more focused approach has been used to determine this liability, although this does not include residual risks and other risk items.

There are potential risk items which could increase the closure liability, with these being additional covers required on the Greenside discard dump and the requirement to mitigate operational impacts of the Greenside discard dump on the shallow groundwater downstream of the dump. This could add ZAR270 to ZAR420 million to the liability.

SRK is of the opinion that Greenside has met statutory requirements and has a robust understanding of what the liability is, with future work required to refine the estimate as the end of LoM approaches.



srk consulting

GREENSIDE COLLIERY CPR
Location of the Company's Operations highlighting Greenside Colliery

Project No.
566644

Figure 1-2: Location of the Company's Operations highlighting Greenside Colliery

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of Dec 2020.

1.5. Verification and Validation

[SR3.1(ii)] [SV1.0]

SRK has conducted a review and recalculation (Greenside Coal Resources and Coal Reserves) and assessment of all material issues likely to influence the future performance of the mine and the resulting TEPs which included the following:

- Inspection visits to Greenside as detailed in Table 1-2;
- A review of the Coal Resource and Coal Reserve statements for Greenside;
- Reporting of the Coal Resource and Coal Reserve Statements based on information provided by Greenside as at 31 December 2019 and depleted by planned production to 31 December 2020, the Effective Date of this CPR; and
- Measured and Indicated Coal Resources are inclusive of those Coal Resources modified to produce Coal Reserves, i.e. Coal Resources are reported on an inclusive basis of the Coal Reserves.

SRK hereby gives confirmation that it has performed all verification and validation procedures deemed necessary by SRK in order to place an appropriate level of reliance on the technical information provided by the Company and Greenside.

1.6. Limitations, Reliance on Information, Declaration, Consent and Cautionary Statements

1.6.1. Limitations

[SR1.7(i)] [SV1.10]

Coal Reserve estimates are based on many factors, including data with respect to drilling and sampling. Coal Reserves are derived from estimates of future technical factors, operating expenditure (**Opex**) and capital expenditure (**Capex**), product prices and the exchange rate between the various currencies and the United States Dollar (**USD**). The Coal Reserve estimates contained in this report should not be interpreted as assurances of economic life of Greenside. As Coal Reserves are only estimates based on the factors and assumptions described herein, future Coal Reserve estimates may need to be revised. For example, if production costs increase or product prices decrease, a portion of the current Coal Resources, from which the Coal Reserves are derived, may become uneconomical to recover and would therefore result in lower estimated Coal Reserves. Furthermore, should any of the assumed factors change adversely, the TEPs and value for Greenside as reported herein may need to be revised and may well result in lower estimates.

This CPR contains statements of a forward-looking nature. These forward-looking statements are estimates and involve several risks and uncertainties that may cause the actual results to differ materially from those anticipated in the CPR.

The achievability of the projections, LoM plans, budgets and forecast TEPs as included in this CPR is neither warranted nor guaranteed by SRK. The projections as presented and discussed herein have been proposed by Greenside management and have been adjusted where appropriate by SRK.

The projections cannot be assured as they are based on economic assumptions, many of which are beyond the control of Greenside and the Company. Future cash flows and profits derived from such forecasts are inherently uncertain and actual results may be significantly more or less favourable.

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

The COVID-19 pandemic has led to significant volatility and uncertainty in the global economy. The potential impact of the evolving COVID-19 situation on consumers, supply chains, commercial agreements, geopolitical outcomes, operating conditions and future decisions that the Company may have to make means that the financial forecasts may differ materially from those set out in this report.

Unless otherwise expressly stated, all the opinions and conclusions set out in this CPR are those of SRK.

1.6.2. Reliance on Information

[12.9(d)(e), 12.10(e), 12.10(h)(iv)]

SRK has relied upon the accuracy and completeness of technical, financial and legal information and data:

- Furnished by or through the Company or Greenside, including information and data originating with the Company or Greenside Advisors; and
- In respect of publicly available information published by the Company from time to time, including but not limited to any Coal Resource and Coal Reserve statements and technical studies contained in such information or data.

The Company has confirmed that, to its knowledge the information provided by it to SRK was complete and not incorrect or misleading in any material aspect. SRK has no reason to believe that any material facts have been withheld.

Whilst SRK has exercised all due care in reviewing the supplied information, SRK does not accept responsibility for finding any errors or omissions contained therein and disclaims liability for any consequences of such errors or omissions.

The technical views in this report are based on information provided by the Company and its advisors throughout the course of SRK investigations, which in turn reflect various technical-economic conditions prevailing at the date of this report. In particular, the Coal Reserves, TEPs and value of Greenside are based on expectations regarding commodity prices prevailing at the Effective Date of this CPR. These can change significantly over relatively short periods of time. Should these change materially, the TEPs could be materially different in these changed circumstances.

SRK has reviewed the information provided by the Company and is satisfied that the extents of the properties described in the various rights are consistent with the maps and diagrams received from the Company. SRK has placed reliance on Mr Christopher Harding, Project Manager for the Company, regarding the accuracy of all legal information in this CPR and the validity of the Company's title to the Mining Rights and surface rights held over Greenside.

SRK believes that its opinion must be considered as a whole and selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in this CPR. The preparation of a CPR is a complex process and does not lend itself to partial analysis or summary.

SRK has no obligation or undertaking to advise any person of any development in relation to Greenside which comes to its attention after the date of the CPR or to review, revise or update the CPR or opinion in respect of any such development occurring after the date of the CPR.

This report includes technical information, which requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, SRK does not consider them to be material.

1.6.3. Declaration (Independence)

[12.9(b), 12.10(c), 12.12(a)] [SV1.0]

SRK will be paid a fee for this work at commercial rates in accordance with normal professional consulting practice. Payment of fees is in no way contingent upon the conclusions to be reached in the CPR.

Neither SRK nor any of its employees or associates to be employed in the CPR of Greenside, nor any of the Competent Persons and/or Competent Valuators who are responsible for authoring this CPR, nor any directors of SRK have at the date of this report, nor have had within the previous two years, any material shareholding in the Company, Greenside, any of the Company's Advisors, or any other pecuniary, economic or beneficial interest, or the right to subscribe for such interest, whether direct or indirect, in the Company, Greenside, any of the Company's advisors or the outcome of the work.

Consequently, SRK, the Competent Persons and the Competent Valuator consider themselves to be independent of the Company, its directors, senior management and Advisors.

In this CPR, SRK provides assurances to the Board of Directors of the Company, in compliance with the requirements of the reporting standards, that the Coal Reserves, TEPs, including production profiles, operating expenditures and capital expenditures for Greenside, as provided to SRK by the Company and reviewed and where appropriate modified by SRK, are reasonable given the information currently available.

In compliance with Item 1.2 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018, SRK accepts responsibility for this CPR and, to the best of SRK's knowledge, declares that the information set out in this CPR is in accordance with the facts and this CPR makes no omission likely to affect its import.

1.6.4. Consent

[12.12(a)] [SV1.0]

SRK consents to the issuing of this report in the form and context in which it is to be included in the Listing Documentation and the registration document.

SRK has given and has not withdrawn its written consent for the inclusion of this CPR in any documentation in support of the Listing Documentation of the Offer.

SRK has given and has not withdrawn its written consent to:

- The issue of the Listing Document with the inclusion of the references to its name: and
- The inclusion of information extracted from this CPR in "Part VIII – Business Overview" of the Listing Document and has authorised the contents of this CPR and references thereto as part of the Listing Document for the purposes of Item 1.3 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018.

1.6.5. Cautionary Statements

[SV1.15]

The reader and any potential or existing shareholder or investor is cautioned that the Company is involved in mining Greenside and there is no guarantee that any unmodified part of the Coal Resources will ever be converted into Coal Reserves nor ultimately extracted at a profit.

1.7. Indemnities provided by the Company

The Company has provided the following indemnities to SRK:

- In the event that the Company discloses or distributes any SRK work product or other deliverable (including reports, analysis, opinion or similar) (the "**SRK Work Products**") to any third party, the Company shall procure that such third party complies *mutatis mutandis* with various of the Company's obligations to SRK that are contained in the engagement letter between Webber Wentzel Attorneys (**WW**) and SRK, and, unless otherwise agreed in writing by SRK, no such third party shall be entitled to place reliance upon any information, warranties or representations which may be contained within the SRK Work Products and the Company shall indemnify SRK against all and any such claims, losses and costs which may be incurred by SRK arising from the breach by the Company of this obligation. This indemnity shall not apply in relation to the provision by the Company of drafts of this CPR to its advisors and the JSE and in relation to, or following, the public release of this CPR in the Listing Documentation; and

- The Company has confirmed to SRK that, to its knowledge, the information provided by it to SRK was complete and not incorrect or misleading in any material aspect. SRK has no reason to believe that any material facts have been withheld. Whilst SRK has exercised all due care in reviewing the supplied information, SRK does not accept responsibility for finding any errors or omissions contained therein and disclaims liability for any consequences of such errors or omissions.

1.7.1. Copyright

Copyright in all text and other matter in this document, including the manner of presentation, is the exclusive property of SRK. It is a criminal offence to publish this document or any part of the document under a different cover, or to reproduce and/or use, without written consent, any technical procedure and/or technique contained in this document. The intellectual property reflected in the contents resides with SRK and shall not be used for any activity that does not involve SRK, without the written consent of SRK.

1.8. Qualifications of Consultants

[SR9.1(i)(ii)] [SV1.0]

SRK is part of an international group (the SRK Group) that comprises almost 1 400 staff, offering expertise in a wide range of resource engineering disciplines. The SRK Group's independence is ensured by the fact that it holds no equity in any project and is totally owned by its employees. This permits SRK to provide its clients with conflict-free and objective recommendations on crucial judgement issues.

SRK has a demonstrated track record in undertaking independent assessments of Resources and Reserves, project evaluations and audits, CP Reports, Resource and Reserves Compliance Audits, Independent Valuation Reports and independent feasibility evaluations to bankable standards and valuation of mineral properties on behalf of exploration and mining companies and financial institutions world-wide. The SRK Group has also worked on many major international mining operations and their projects, providing mining consultancy service inputs. SRK has specific in commissions of this nature.

The following are the CPs responsible for the signing off on Greenside Coal Resources, Coal Reserves and Coal Asset Valuation:

- The CP with responsibility for the reporting of Coal Resources is Ms Lesley Jeffrey, PrSciNat (Reg. No. 400115/01). A Fellow of the GSSA and a Member of the Fossil Fuel Foundation of Africa, who is a Principal Geologist with SRK. Ms Jeffrey is a geologist with over 35 years' experience in coal specializing in exploration, geological modelling and resource estimation;
- The CP assuming responsibility for the reporting of Coal Reserves is Mr Norman McGeorge, PrEng (Reg. No. 20080141). A member of the SAIMM, who is a Principal Mining Engineer at SRK. Mr McGeorge is a mining engineer with more than 34 years' experience in the mining industry. He has worked on numerous collieries in mine planning, engineering design, competent persons reporting, mine valuation and feasibility studies both locally and internationally; and
- The CV^2 with responsibility for Greenside Valuation is Mr Andrew van Zyl, BEng (Chemical), M.Com (Financial Economics). A Fellow of the SAIMM, who is a Principal Consultant at SRK. He is the current chairman of SAMVAL and has more than 20 years' experience in mining and engineering with more than 10 years in the valuation of Mineral Projects and Assets.

Please refer to Appendix C for the Certificates of the Competent Persons and Competent Valuator.

This CPR has been prepared based on a technical and economic review by a team of consultants sourced from SRK's offices in South Africa. These consultants are specialists in the field of geology, Coal Resource and Coal Reserve estimation and classification, mining, geotechnical engineering, mineral processing, hydrology and hydrogeology, infrastructure, mine closure, environmental, social and asset valuation. The consultants who have carried out the work have extensive experience in the mining industry and are members in good standing of appropriate professional institutions. Details of their qualifications and discipline are set out in Table 1-1.

Table 1-1: Consultant Contributors

Name	Qualification	Registration	Contribution
Andrew van Zyl	BEng, MCom (Financial Economics & Econometrics)	FSAIMM	Asset Valuation, CV[2]
Andy McDonald	MSc (Geophysics), MBL, MIoM[3]	CEng	B-BEE Status, Marketing and Utilisation, Material Contracts
Ansu Louw	BA (Geography), MA (Environmental Management)		GIS and Graphics
Ashleigh Maritz	BSc, MSc (Biochemistry)	EAP; Pr.Sci.Nat.	Environmental Permitting, Compliance
Benedict Mabenge	BSc (Hons), MSc (Hydrogeology)	Pr.Sci.Nat.	Groundwater (Hydrogeology)
Bjanka Korb	BEng (Hons)	PrEng	Surface Water (Hydrology)
Carrie Zermatten	BSc (Hons), MSc	Pr.Sci.Nat.	Risk Assessment
Colin Wessels	BSc (Hons) (Engineering Geology)	Pr.Sci.Nat.	Coal Discard
Connan Hempel	BSc, MSc (Geology)	Pr.Sci.Nat.	Geology
Darryll Killian	BA, MA (Environmental and Geographical Science)	CEAPSA	Environmental Permitting, Compliance
James Lake	BSc (Hons), MSc	Pr.Sci.Nat.	Mine Closure and Rehabilitation Requirements
Jaques van Eyssen[1]	MEC		Occupational Health and Safety, Ventilation
Jessica Edwards	BSocSci (Hons), MA		Social permitting and stakeholder relations
Katherine Black	BSc (Hons), GDE	Pr.Sci.Nat.	Geology, Coal Resources, Exploration
Kenny Mahuma	N6 Diploma (Electrical Engineering)	PrTechEng	Electrical, Control, Communication, Maintenance Management, Project Management, Reporting
Lesley Jeffrey	BSc (Geology), MSc (Mining)	Pr.Sci.Nat.	Geology, Exploration, Coal Resources, Project Management, Reporting, Coal Resources and Lead CP
Lisl Fair	BA, MA (Communications Pathology)		Sustainability aspects
Nico Lotheringen[1]	Dip (Advanced MRM) BTech (Architectural Technology)	PrEng	Review of Life of Mine Scheduling
Norman McGeorge	BSc (Mining), MSc (Mining)	PrEng	Mining, Scheduling, Coal Reserves, Coal Reserves CP
Peter Hand	BSc (Hons)		Coal Processing
Peter Shepherd	Pr Sci Nat (400104/95), BSc (Hons) in Hydrology	Pr.Sci.Nat.	Surface Water (Hydrology)
Pierre Mans	NDip (Mining)		Mining (Technical)
Susan Benedict			Graphics
Vanessa Snyman	BCom, BCom (Hons) (CA) SA		Asset Valuation
Vassie Maharaj	BSc (Biochemistry, Physiology)		Social permitting and stakeholder relations
William Joughin	BSc Eng (Mining) MSc Eng (Management), GDE (Rock Engineering)	PrEng	Rock Engineering
Willie Schoeman[1]	BSc (Mechanical Engineering)	PrEng	Mechanical Engineering

Note:
1. Independent SRK Consultant

1.9. Site Visits

[SR1.1(iii)]

SRK personnel visited the Greenside operations as part of the inspection of surface and underground facilities and coal crushing/screening facilities. SRK personnel also met with the Company personnel representing the relevant disciplines of Greenside as indicated in Table 1-2.

The purpose of the site visit included but was not limited to the following:

- Review of the engineering infrastructure and discussions of the maintenance management systems;
- Review and discussion of the database informing the Coal Resources;
- Review of the LoM planning process and the conversion of Coal Resources to Coal Reserves;
- Review and discussion of major contracts;
- Review of the coal plant recovery methods; and
- Review and discussion with Greenside personnel of the status quo involving Greenside permitting, key environmental and social aspects and mine closure considerations.

Table 1-2: Site Visits

Date	Location	Name	Topic
27/11/2019	Greenside	Ashleigh Maritz	Environmental Aspects
		Lesley Jeffrey	Exploration, Geology and Coal Resources
		William Joughin	Geotechnical Engineering (Mining)
		Benedict Mabenge	Hydrogeology
		Kenny Mahuma	Electrical Engineering, Control and Communications
		Willie Schoeman	Mechanical Engineering
		Peter Hand	Metallurgy and Coal Processing
		James Lake	Mine Closure
		Noddy McGeorge	Mining, Coal Reserves, Safety and Marketing
		Jessica Edwards	Social Aspects
		Rob McNeill Colin Wessels	Coal Discard
27/11/2019	Witbank – Central Services	Andrew van Zyl	Economic Evaluation
03/12/2019	Witbank – Central Services	Noddy McGeorge	Mining and Coal Reserves
05/12/2019	Greenside	Andrew van Zyl	Economic Evaluation
09/12/2019	Greenside	Kenny Mahuma	Maintenance Management Systems
28/01/2020	Greenside	Bjanka Korb	Hydrology

2. Description of Asset and Location

[12.10(h)(ii)(iii)] [SR1.2(i)]

2.1. Property Location

[12.10(h)(ii)(iii)] [SR1.2(i)] [SV1.5] [ESG4.5]

Greenside is an underground coal mine located approximately 120 km east of Johannesburg and approximately 15 km southwest of eMalahleni (previously Witbank), in Mpumalanga Province, South Africa. The mine falls within the eMalahleni Local Municipality, within the Nkangala District Municipality. It forms part of the South African Coal Estate (**SACE**) complex, along with Khwezela Colliery (the amalgamation of Landau and Kleinkopje Collieries). The location of Greenside is shown in Figure ES.1.

The Rail Load-out Terminal (RLT) is situated approximately 2.5 km northeast of the mine infrastructure area and is shared with Khwezela, while the eMalahleni Water Reclamation Plant (**EWRP**) is shared between Greenside, Khwezela and South African Energy Coal Ltd's (**SAEC)** South Witbank Colliery. There is one Mineral Residue Deposit (**MRD**), the Greenside MRD, a coal preparation plant complex and an incline shaft (Daylight Shaft or Cairn Shaft) that accesses the underground workings.

2.2. Co-ordinate System

[SR1.2(i)]

All survey information is based on the LO29 trigonometrical system that has the co-ordinates of the origin as y, x = ± 0 and the constants used as Y, X = 0; the elevation is measured in metres above mean sea level (**mamsl**).

The Greenside Colliery Benchmark is a concrete beacon embedded in a concrete block, identified as benchmark, situated between the main offices and the Cairn Shaft. Its co-ordinates are shown in Table 2-1.

Table 2-1: Co-ordinates of the Greenside Benchmark

Projection: Gauss Conform (LO System) Ellipsoid: Clark 1880 Modified LO 29 East				Projection: Gauss Conform (WGS System) Ellipsoid: WGS 1984 LO 29 East			
LO Co-ordinates		**Geographical Co-ordinates**		**WGS29 Co-ordinates**		**Geographical Co-ordinates**	
Y	**X**	**Latitude**	**Longitude**	**Y**	**X**	**Latitude**	**Longitude**
-17 778.447	+2 871 926.895	25°57'27.7413"S	29°10'39.0244"E	-17 751.191	+2 872 223.270	25°57'29.7671"S	29°10'38.0656"E
Elevation:	1 548.096 mamsl For the underground workings, a baseline of 1 598.242 m, relative to the original bench elevation, is used for all mine survey						

The Company uses the Cape Datum (**LO System**) for the geological and mine models. All diagrams in this report have therefore also used the Cape Datum.

2.3. Adjacent Properties

[SR1.3(i)]

Greenside is bordered by SAEC's South Witbank Colliery in the northeast, the Company's Khwezela South Colliery (**Khwezela South**) **-** previously Kleinkopje Colliery - in the east; Glencore Operations SA's (**Glencore**) Tweefontein Complex in the south, SAEC's Klipspruit Colliery in the southwest and the Company's Khwezela North Colliery (**Khwezela North**) - previously Landau Colliery - in the west and north (Figure 3-1).

The rail load-out is shared with Khwezela North and Khwezela South, while the water treatment plant is shared between Greenside, Khwezela North and Khwezela South and SAEC.

2.3.1. South Witbank Colliery

South Witbank Colliery lies to the northeast of Greenside and is owned by SAEC but is not an active colliery. Water from this mine is treated in a shared water treatment plant facility.

2.3.2. Khwezela Colliery (amalgamation of Kleinkopje and Landau Collieries)

In December 2016 a merger of Kleinkopje and Landau mines was launched, to form what is now known as Khwezela Colliery. The merger was necessitated by the fact that both sites were approaching the end of their operational lives, with one pit expected to close at Khwezela South in early 2017, and a further two at Khwezela North the following year. The Company indicated in their media release dated 01 February 2017 that amongst other benefits, the active reserves will comfortably take Khwezela to 2024, while further resources offer the potential for 30 years of coal extraction. The colliery forms part of SACE.

Khwezela North lies to the north and west of Greenside and is separated from Greenside by the provincial road. The current operation is an opencast pillar recovery mine using the Navigation plant to process the coal. The mine is recovering coal from the No 5, No 4 and Number 2 (**No 2 Seam**) and No 1 Seams.

Khwezela South is situated to the east of the property.

2.3.3. Tweefontein Complex

Tweefontein Complex is located south of Greenside and is owned by Glencore. The mine was originally an underground mine but has reverted to an opencast pillar recovery operation. In the vicinity of the Waterpan North area between the two mines some coal swaps have been done to allow full extraction of the resources from the Greenside infrastructure.

2.3.4. Klipspruit Colliery

Klipspruit Colliery lies to the southwest of Greenside and is owned by SAEC. The portion of the mine that is adjacent to Greenside is the Weltevreden pit that is just about to be exploited as an opencast operation.

2.4. Access, Infrastructure, Climate, and Physiography

[SR1.1(ii)] [SR5.4(i)(ii)]

2.4.1. Accessibility

[SR1.1(ii)]

The mine is accessible by tarred regional roads leading off the N12 national road and a railway line traverses the property in the north, connecting the rail load-out terminal with the Richards Bay Coal Terminal.

The closest sizeable town to Greenside is eMalahleni, approximately 15 km northeast of the mine. Ogies is approximately 20 km to the southwest with the rural settlement of Clewer approximately 13 km to the northwest. Provincial and national roads provide easy access to eMalahleni, via the R555, the N12 and the N4. The Mpumalanga rail network connects the coal mining areas around eMalahleni to the ports of Richards Bay and Durban in KwaZulu-Natal, and to Maputo in Mozambique. The line down to Richards Bay passes through the Greenside Area of Responsibility (**GAR**), connecting the rail load-out terminal with Richards Bay Coal Terminal (**RBCT**) (Figure 1-2). The GAR is the area mined by Greenside that extends past the boundaries of the colliery itself into parts of the adjacent Company areas, namely, Khwezela North and South. The GAR is determined so that the coal in the Khwezela areas is mined in the most suitable way.

Access control into the mine is via the manned security at the main access gate to the mine. As the main entrance is some distance from the main offices, visitors are allowed to drive through to the areas where they intend to visit, but only after security has confirmed with the employee who is being visited.

2.4.2. Infrastructure

[SR1.1(ii), SR5.4(i)(ii)]

Regional infrastructure includes roads, railway lines, water and power supply. Mine-specific infrastructure includes housing, offices, storerooms, changerooms, workshops, road, conveyors, an incline shaft (Daylight Shaft) that accesses the underground workings a coal preparation plant and the Greenside MRD.

An RLT has been constructed on the property. The RLT is shared with Khwezela North and Khwezela South.

Coal is delivered to the coal preparation plant using a network of conveyor belts from underground and thence by conveyor and trucks to the RLT. Delivery of coal to the RLT is contracted to Zizwe.

The eMalahleni Water Reclamation Plant (**EWRP**) is a water treatment plant operated by the Company for water pumped from underground during mine dewatering. The EWRP is located within the Greenside Mining Right (**MR**), but services several coal mining operations (Greenside, Khwezela North and South, Zibulo and SAEC), local communities, the eMalahleni Municipality and the Phola Coal Processing Plant. Greenside is supplied with potable water from the EWRP, for domestic use at the mine offices, change houses and village, at a rate of 2 000 m³/d. The water is stored in the “Blue Tank” at the colliery. Make-up process water is also supplied by the EWRP and is pumped via the Shaft Erickson Dam to the underground mine workings for mining of the Number 4 Seam (**No 4 Seam**).

Bulk power to the mine is supplied by Eskom Holdings SOC Limited (**Eskom**), the South African power supply authority, via three Points of Delivery (**POD**s) namely Greenside 1st Point, Greenside 2nd Point and Greenside 2 Cairns. The agreed Notified Maximum Demand (**NMD**) at the three PODs are 7.5 MVA, 1 MVA and 10 MVA.

2.4.3. Climate

[SR1.1(ii)] [ESG4.4]

The area lies in the summer rainfall region (Eastern Highveld) of southern Africa, with cold and dry winters, and warm and wet summers. Temperatures typically range from 9°C to 32°C in summer with maximum daily temperatures being experienced between November to March. Winter temperatures range from 6°C to 22°C with June to August being the coldest months; frost occurs frequently between May and September.

Wind in the area blows predominantly in a northerly direction during winter and spring, and mostly in a south easterly direction during summer and autumn; the strongest winds are experienced during late winter to early spring.

Rainfall is highly seasonal and according to the Department of Water, Sanitation and Human Settlements (**DWSHS**) datasets, the area experiences a mean annual rainfall of 702.7 mm. Most of the rainfall occurs during the summer months (October to March/April) during intense localised thunderstorms that appear from the southeast. Severe hail is not uncommon during these storms. Highest rainfall is usually experienced in January and the lowest in July.

The mine operates 24 hours per day throughout the year (365 days) as the climate does not prevent mining from taking place, although occasionally heavy summer rainfall may impact operations for short periods of time.

2.4.4. Physiography

[SR1.1(ii)] [ESG4.4]

The area is typical of the Eastern Highveld with gently rolling hills and shallow valleys. The surface topography rises from about 1 540 mamsl in the south to 1 580 mamsl in the north (Figure 2-1). Much of the natural topography in the surrounding areas has been disturbed by historical mining and rehabilitation operations

Numerous streams cross the area, including the Naauwpoortspruit and its associated wetlands just outside the GAR. Several shallow pans can be found, the largest being the Clydesdale Pan (Figure 2-1). This pan is over 200 ha in extent and was previously used as an evaporation facility for excess dirty mine water from the nearby Kleinkopje Colliery. This has substantially altered the water quality and the hydrology, although discharge from the pan was stopped in 2007. A large hillslope seepage wetland surrounds the pan. Watercourses often display “ox bow” configurations or form marshes with undefined channels. Surface runoff flows into marshy pans or tributaries, which in turn flow into the Olifants River. Greenside is thus within the catchment area of the upper Olifants River, which drains into the Witbank and Loskop Dams and thence through the Kruger National Park into the Massingir Dam in Mozambique. Thereafter, it joins the Limpopo River before flowing into the Indian Ocean south of Xai-Xai, Mozambique. The Olifants River is greatly impacted by agriculture, mining and municipal activities in its upper reaches, to the detriment of wildlife downstream.

The area falls within the Mesic Grassland Biome, subdivided into the Rand Highveld Grassland and the Eastern Highveld Grassland. The former originally covered most of the area and is typical of sloping plains and rocky ridges. When unspoiled, it is rich in a variety of grass species but much of this grassland has been disturbed by maize production. Small trees can be found along the rocky ridges. The Eastern Highveld Grassland is restricted to moderately undulating plains. The vegetation is short and dominated by grasses with almost no indigenous trees.

2.4.5. Current Mining

The GAR consists of ground from the Greenside Mining Right plus two adjacent opencast Company Mining Right areas, Khwezela North and South. Note that only portions of the Khwezela Mining Rights are mined by Greenside (refer to Figure 3-1 and Section 3.3.1 for details). Greenside mines the coal from these adjacent areas as the coal is too deep to be economically extracted from surface and is accessible from existing Greenside underground workings.

2.5. Mining History

[SR1.4] [SV1.6]

2.5.1. Historical Development

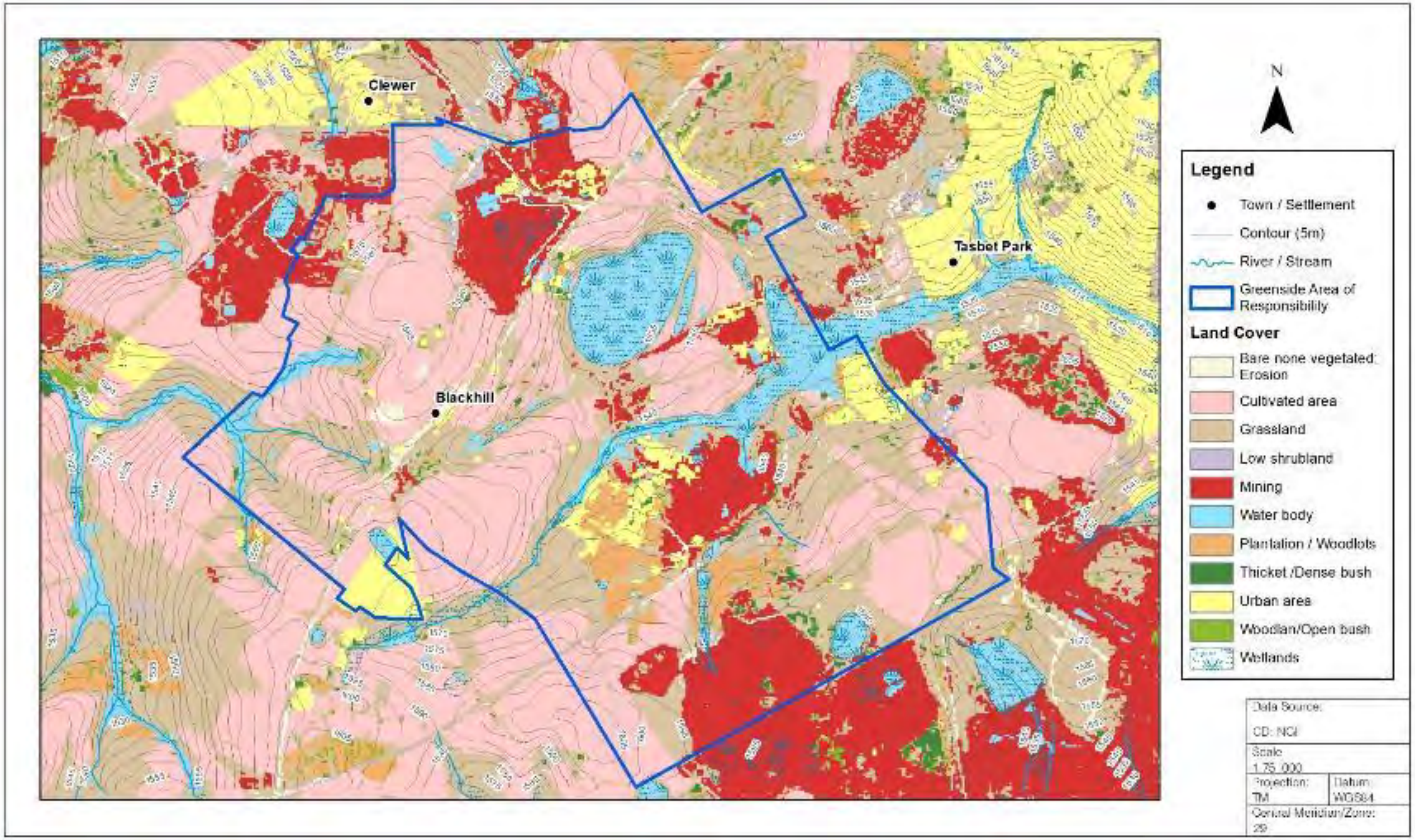
[SR1.4(i)(ii)] [SV1.6]

According to Macnab (1987), Greenside was probably established sometime during the Second World War and was acquired around 1944 by Apex Mines, which became a subsidiary of Gold Fields of South Africa (**GFSA**) in 1959. Greenside became one of the largest underground collieries in the area and supplied coal to both the export and domestic market, as well as to local steel producers such as Highveld Steel. In the 1970s it was one of the suppliers of low ash coal to the Japanese steel mills, exporting through the newly developed RBCT. Seams mined were the Number 1 Seam (**No 1 Seam**) and the overlying No 2 Seam and Number 5 Seam (**No 5 Seam**), using bord and pillar by drill and blast methods. Conversion to fully mechanised continuous miner (**CM**) operations occurred by the 1990s. The No 2 Seam operations ceased in 1996 and the No 5 Seam in 2012; currently the remaining No 4 Seam resources are exploited, supplying the export thermal coal market.

In 1986 the coal interests of GFSA were consolidated into Gold Fields Coal and were purchased by the Company in 1998. The Greenside historical development is presented in Table 2-2.

Table 2-2: Greenside Historical Development Summary

Date	Activity
Second World War	Establishment of Greenside
1944	Greenside acquired by Apex Mines
1959	Apex Mines becomes subsidiary of GRSA
1970	Supplier of low ash coal to Japanese steel mills through RBCT
1981	Annual output increases from 1.6 Mtpa to 2.7 Mtpa through mechanised mining
1986	Gold Fields Coal takes over coal interests of GFSA
1999-2000	The Company acquires Greenside



srk consulting

GREENSIDE COLLIERY CPR
Physiography and Land Use of the Greenside Area

Project No.
566644

Figure 2-1: Physiography and Land Use of the Greenside Area

2.5.2. Prior Ownership

[SR1.4(i)(ii)] [SV1.6]

The reader is referred to the discussion in Section 2.5.1.

2.5.3. Historical Operating Statistics

[12.9(c)] [SR1.4(i)(iii)(iv)] [SV1.6]

Historical production per mining section for the past five years is shown in Table 2-3, while Table 2-4 shows the historical operating statistics for Greenside for the last three years. Note that figures for 2020 incorporate the impact of the COVID-19 national lockdown.

Table 2-3: Historical Production

Section	2017 (Mt)	2018 (Mt)	2019 (Mt)	2020 (Mt)
George	1.00	1.02	0.87	0.71
Thandeka	1.05	1.11	1.10	0.90
Thusanang	0.89	1.00	1.13	1.00
Vumagara	1.12	1.20	1.16	1.08
Shosholoza	0.62	0.73	0.71	0.73

Table 2-4: Historical Operating Statistics for Greenside Colliery (2017 to 2020)

Parameter	Unit	2017	2018	2019	2020
Production:	**(kt)**	**4 701**	**5 101**	**4 920**	**4 422**
RoM Coal Mined	(kt)	4 870	5 057	4 974	4 422
Saleable Production	(kt)	3 296	3 676	4 008	3 695
Export Coal Sales	(kt)	3 296	3 676	3 595	3 080
Inland Coal Sales	(kt)	-	-	413	615
Revenue:					
Gross Sales Revenue	(ZARm)	3 495	3 565	3 285	2 309
Logistics/Selling Expenses	(ZARm)	603	691	708	417
FoR Sales Revenue	(ZARm)	2 891	2 874	2 577	2 043
Operating Costs:					
Total Cash cost	(ZARm)	1 430	1 395	1 587	1 802
Depreciation/other non-cash costs	(ZARm)	234	176	210	306
Cost of Production	(ZARm)	1 430	1 395	1 587	1 802
Unit Costs:					
Cash Cost per Saleable Tonne	(ZAR/t Saleable)	434	379	396	487
Cost of Production	(ZAR/t Saleable)	505	427	448	487
FoB Cash Cost	(ZAR/t Saleable)	617	567	573	684

Note:
1. The figures for 2020 domestic sales exclude raw discard sales from the MRD.
2. FoR = Free-on-Rail
3. FoB = Free-on-Board

2.6. Regional Profile

2.6.1. Environmental Profile

[SR1.2(ii)(iii), SR1.5(i), SR5.5(i)(iii)] [SV1.2] [ESG4.2, ESG4.4]

Greenside is situated within the watershed of the upper Olifants River catchment, which drains into the Witbank Dam, and subsequently into the Loskop Dam. The Naauwpoortspruit and several other small un-named streams traverse the property. Surface water is generally of a good quality however groundwater quality in the mining area has been affected by mining activities (WSP, 2014).

The surface water resources in the vicinity of Greenside are described in the Wetland Assessment and Impact Report (Digby Wells, 2019):

"Greenside Colliery is situated in proximity to the Noupoort Sub-Quaternary Reach (SQR B11G-01193), also known as the Naauwpoortspruit. The Naauwpoortspruit falls within the Olifants Water Management Area (**WMA** 2) and in quaternary catchment B11G. According to the National Freshwater Ecosystem Priority Areas (**NFEPA**), the majority of wetlands associated with the Greenside Colliery have been assigned a rank of 6 (indicating that they were not regarded as nationally significant), however, the Mpumalanga Biodiversity Sector Plan (**MBSP**) has delineated approximately 50% of the Greenside Colliery study area as 'Protected Areas National Parks and Nature Reserves'. These are areas that are formally protected by law and recognised in terms of the Protected Areas Act. Therefore, these areas must meet biodiversity targets and be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity".

Greenside is bordered by other coal mining operations and coal-fired power stations are situated within 50 km of the colliery; therefore, the ambient air quality of the area is considered poor.

Increased levels of noise are experienced in the area due to the surrounding coal mine operations and industries.

2.6.2. Social Profile

[SR1.2(ii)(iii), SR5.5(i)(iii)(v), SR7.1] [ESG4.1, ESG4.2, ESG4.5]

The applicable local authority is the eMalahleni Local Municipality, which is within the Nkangala District Municipality. Based on a review of the Greenside Stakeholder Engagement Plan (**SEP**) (Anglo American Coal (**AAC**), 2019b), Greenside is located in close proximity to a number of receptors, including Mgwewane (3.96 km); Smith Brothers 1 (2.42 km); Smith Brothers 2 (3.98 km); Klipfontein (3.54 km); Groenfontein (2.16 km); Naas farm (3.83 km); Weltevreden (5.57 km); local businesses (3.24 km); and the Blackhill houses (2.44 km).

Mgwewane and Blackhill are the main host communities, with smaller pockets of communities located all around. Primary zones of influence include Hlalanikahle Ext.1, KwaGuqa Ext.5, KwaGuqa Ext.14, and Ackerville, which have high levels of unemployment and several active youth pressure groups. The surface area rights belong to several private individuals (i.e. Smith brothers, J Labuschagne, B Thabethe, BJ Venter and RM Botha). Even though there is no traditionally owned land, Chief Bhorholo Mahlangu, who resides in Weltevreden is regularly engaged by Greenside.

Greenside's Social Performance function implements the Anglo American Social Way (**AASW**). AASW audits take place on an annual basis to measure progress against the Company's Socio-Economic Assessment Toolbox (**SEAT**). The SEAT process has been designed to understand the positive and negative impacts of the operations on host communities and has now been incorporated as part of the third and latest Anglo American Social Way (**AASW3**). The AASW3 aims to facilitate more structured dialogue with stakeholders through the implementation of management responses.

3. Regulatory Environment and Tenure

[12.10(h)(iv)] [SR1.5] [SV1.5] [ESG4.1]

This section covers a brief overview of the South African regulatory environment within which the Company operates and the status of Greenside with respect to the requirements of the applicable laws.

3.1. South African Regulatory Environment

[12.10(h)(iv)] [SR1.5] [SV1.5]

The relevant South African regulatory framework is summarised below.

3.1.1. Constitution of the Republic of South Africa Act (Act No. 108 of 1996)

Section 24 of the *Constitution of the Republic of South Africa (Act 108 of 1996)* states: "everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

- Prevent pollution and ecological degradation;
- Promote conservation; and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

The Constitution is the supreme law of the country, and all conduct and legislation inconsistent with its contents is unlawful and will be set aside.

3.1.2. Mineral Framework: The Minerals and Petroleum Resources Development Act (Act 28 of 2002)

The Mineral and Petroleum Resources Development Act (MPRDA) is the primary legislation used to regulate the mining industry since it came into effect on 1 May 2004. The DMRE is the national department tasked with implementing the MPRDA and regulating the mining industry. Until 30 April 2004, the right to prospect for and to mine was primarily regulated by the Minerals Act. The Minerals Act vested the right to mine a particular mineral in the holder of the mineral rights in respect of the relevant mineral in relation to the land in question.

The MPRDA extinguished private ownership of mineral rights and replaced it with a system of State grant of the right to prospect and mine. South Africa's mineral and petroleum resources were placed under the State's custodianship. A key element of the MPRDA is the change from a legal framework within which mineral rights formed an inherent element of immovable property, which encompassed the right to prospect and mine (subject to regulation by the State), to a system where the State, acting through the Minister, will grant the right to prospect and mine.

Owing to the change brought about by this new system, provision had to be made for a transition from the old regime, in which the role of the State was regulatory in nature and in which the right to prospect and mine vested in the holder of mineral rights, to the new current regime which provides for the State, acting through the Minister, to grant Prospecting Rights, mining permits and Mining Rights.

Those holding mineral rights when the MPRDA came into effect were afforded an opportunity in terms of the transitional arrangements contained in Schedule II to the MPRDA to apply to convert their old order rights into prospecting or Mining Rights, thus protecting the security of tenure of those holding rights before the MPRDA came into effect. Upon conversion, or failure to convert within the specified time periods, the old order rights ceased to exist. Such cessation to exist also terminated any contractual provisions relating to the use of the surface of the land for prospecting and/or mining activities. Upon the conversion of old order right into a Prospecting Right or Mining Right, the right to use the surface of land is primarily regulated by the MPRDA and practically by agreements between the holder and the landowner.

Under the MPRDA, applicants can apply for Prospecting Rights for the prospecting of minerals and Mining Rights for mining of minerals. Prospecting rights are granted for a period of up to five years with a right to renew the Prospecting Right once for a period up to three years. Mining permits are granted for a period not exceeding two years for an area less than five hectares in extent. Mining permits may be renewed for three periods each not exceeding one year. Mining Rights are granted for a period up to thirty years with a right to renew the Mining Right twice, assuming that the holder can justify that it can continue mining operations.

Under the MPRDA, rights are granted to entities by the State on a “first come, first served” basis in terms of an application system. Applicants must meet certain requirements set out in the MPRDA, and on meeting such requirements, the Minister must grant the right. A failure to grant a right is an administrative action that is capable of internal appeal before the DMRE. After an internal appeal, a judicial review process is available to aggrieved applicants. The MPRDA does provide that administrative processes must be conducted, or administrative decisions must be taken within a reasonable time and in accordance with the principles of lawfulness, reasonableness and procedural fairness and that these decisions must be given in writing and accompanied by written reasons. Once rights are granted to applicants, the right must be executed in the form of a notarial deed and registered at the Mineral and Petroleum Titles Registration Office (**MPTRO**) in order for the right to be a limited real right enforceable against the third parties.

Holders of rights in terms of the MPRDA must comply with the provisions of the MPRDA and the terms and conditions on which the right was granted, as well as the provisions of the Original Mining Charter for effecting entry of Historically Disadvantaged South Africans (**HDSA**s**)** into the mining industry. Holders of Mining Rights must comply with the SLP approved in conjunction with the grant and execution of the Mining Right. The SLP relates to the obligations placed on the Mining Right holder to, amongst other things, train employees of the mine in accordance with prescribed training methodologies, achieve employment equity and human resource development in the mining company, improve housing and living conditions of employees and set up local economic development projects. A failure to implement the SLP could attract the issuing of a directive or notice by the DMRE to rectify non-implementation of the SLP. Failure to comply with the directive or notice could result in the imposition of fines and ultimately, in suspension or cancellation of the Mining Right.

Holders of Mining Rights must also comply with the Mine Works programme (**MWP**) approved as part of the Mining Right upon execution thereof. The MWP relates to the obligations in relation to mining methods, expected production and other technical aspects of the mining operations. If the plan or expected production is changed over the life of the project, then there is a provision to amend the MWP with the consent of the Minister in terms of Section 102 of the MPRDA.

Renewal of a Mining Right

Applicants for the renewal of a Mining Right must provide a report reflecting the extent of the compliance with the requirements of the approved Environmental Authorisation (**EA**) and include a detailed MWP for the renewal. In addition, the applicant in terms of Section 24(3) has to demonstrate that it, as the holder of the Mining Right, has complied with the requirements of the prescribed SLP, which does not apply to Prospecting Right renewal.

The maximum period of a renewal of a Mining Right is 30 years, but it can be renewed for further periods (each of which may not exceed 30 years at a time).

In terms of Section 25(1) of the MPRDA, the holder of a Mining Right has the exclusive right to apply for and be granted a renewal of the Mining Right in respect of the mineral and mining area in question.

The Holder of a Prospecting Right has the Exclusive Right to apply for a Mining Right

In terms of Section 19(1)(b) of the MPRDA, the holder of a Prospecting Right has the exclusive right to apply for and be granted a Mining Right in respect of the mineral and prospecting area in question. Therefore, up until the expiry of the Prospecting Right (including the rights conferred in terms of Section 18(5) and the renewal period), the holder has the exclusive right to apply for a Mining Right and no third party may lodge a valid application during such exclusivity period. Furthermore, once the holder of the Prospecting Right has lodged the Mining Right application, it is protected in terms of Section 9 of the MPRDA, which provides for a first-come first-served application procedure.

The holder of the Prospecting Right would still have to comply with all of the requirements for applications set out in Section 22 of the MPRDA and for the grant of a Mining Right set out in Section 23 of the MPRDA. Section 22 deals with the formalities for the lodgement of a valid application. Section 23 in turn deals with the criteria for the grant of a Mining Right. Essentially the Minister must grant a Mining Right if:

- The mineral can be mined optimally in accordance with the MWP;

- The applicant has access to financial resources and has the technical ability to conduct the proposed mining operation optimally;
- The financing plan is compatible with the intended mining operation and duration thereof;
- The mining will not result in unacceptable pollution, ecological degradation or damage to the environment;
- The applicant has provided for the prescribed SLP;
- The applicant has the ability to comply with the relevant provisions of the MHSA;
- The applicant is not in contravention of any provision of the MPRDA; and
- The grant of the right will further the objectives set out in Section 2(d) and (f) and in accordance with the charter contemplated in Section 100 of the MPRDA and the prescribed SLP.

Protection of Ownership of Mining Assets and Relevant Licences

While the MPRDA does not expressly provide for the protection of ownership of mining assets, Section 25 of the South African Constitution protects the right to property, including mine assets. To this extent, Section 25 provides that no one may be deprived of property except in terms of a law of general application, and no law may permit arbitrary deprivation of property. Property may, however, be expropriated only in terms of a law of general application for a public purpose or in the public interest; and subject to compensation. Therefore, although the South African government (including the Minister) is empowered to expropriate land and rights in land, provision is made for payment of compensation. However, in 2018 an amendment of Section 25 was proposed, this amendment would permit the expropriation of land and property without compensation, in order to address historic wrongs of land dispossession, as well as ensuring fair access to land and empowering the majority of South Africans.

Section 5 of the MPRDA states that a Prospecting Right or a Mining Right which has been registered at the MPTRO is considered to be a limited real right in respect of the mineral and land to which such right relates. The holder of a Mining Right has ownership of the mineral resources once the minerals have been severed from the land, which is enforceable against all third parties.

Security and continuity of tenure are listed in Section 2(g) as among the objects of the MPRDA. Continuity is preserved from prospecting to mining in that the holder of a Prospecting Right has the exclusive right to apply for and be granted a Mining Right. Continuity is further achieved during applications for renewals in that a Prospecting Right or Mining Right in respect of which an application for renewal has been lodged remains in force until the application has been granted or refused. Furthermore, security of tenure and continuity is assured by provisions in the MPRDA to the effect that an application for a right will not be accepted if another person holds a Prospecting Right, Mining Right, mining permit or retention permit for the same mineral and land in respect which such application is made.

3.1.3. Mineral Framework: The Mining Charter

Mining Right holders were initially required to comply with the Original Mining Charter for effecting entry of HDSAs into the mining industry. Among other things, the Original Mining Charter required:

- Each mining company to achieve a 15% HDSA ownership of mining assets within five years of the Mining Charter coming into effect and a 26% HDSA ownership of mining assets within ten years of the Mining Charter coming into effect;
- The mining industry as a whole to agree to assist HDSA companies in securing finance to fund participation in an amount of R100 billion over the first five years; and
- Mining companies to spell out plans for achieving employment equity at management level with a view to achieving a baseline of 40% HDSA participation in management and 10% participation by women in the mining industry, in each case within five years.

Following a review, the DMRE released the 2010 Mining Charter. The requirement under the 2010 Mining Charter for mining entities to achieve a 26% HDSA ownership of mining assets by the year 2014 was retained. The 2010 Mining Charter included the requirements, inter alia, that mining companies:

- Facilitate local beneficiation of mineral commodities;
- Procure a minimum of 40% of capital goods, 70% of services and 50% of consumer goods from HDSA suppliers (i.e. suppliers in which a minimum of 25% + 1 vote of their share capital must be owned by HDSAs) by 2014 (exclusive of non-discretionary procurement expenditure);
- Ensure that multinational suppliers of capital goods contribute a minimum of 0.5% of their annual income generated from South African mining companies into a social development fund from 2010 towards the socio-economic development of South African communities;
- Achieve a minimum of 40% HDSA demographic representation by 2014 at executive management (board) level, senior management (executive committee) level, core and critical skills, middle management level and junior management level;
- Invest up to 5% of annual payroll in essential skills development activities; and
- Implement measures to improve the standards of housing and living conditions for mineworkers by converting or upgrading mineworkers' hostels into family units, attaining an occupancy rate of one person per room and facilitating home ownership options for all mineworkers in consultation with organised labour, all of which must be achieved by 2014.

In addition, mining companies were required to monitor and evaluate their compliance with the 2010 Mining Charter and must submit annual compliance reports to the DMRE. The Scorecard for the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry, attached to the 2010 Mining Charter, made provision for a phased-in approach for compliance with the above targets over the period ending in 2014. For measurement purposes, the Scorecard allocated various weightings to the different elements of the 2010 Mining Charter.

On 27 September 2018, the 2018 Mining Charter came into effect. The content of the 2018 Mining Charter is similar to the 2010 Mining Charter in terms of targets and requirements in relation to ownership, procurement and employment equity. Importantly, the 2018 Mining Charter has given recognition, although to a limited extent, to the concept of "once-empowered always-empowered" by providing that an existing Mining Right holder who has achieved a minimum of 26% HDSA shareholding shall be recognised as compliant for the duration of the Mining Right. However, this does not apply to renewals and to transfers of such a right. For renewals and transfers, the new requirements for new Mining Rights have to be satisfied, namely that there must be a minimum of 30% HDSA shareholding distributed as to a 5% non-transferrable carried interest to qualifying employees, a 5% to non-transferrable carried interest to host communities and a 20% effective ownership for a HDSA entrepreneur. Disposals of HDSA shareholding after 27 September 2018 will be subject to certain restrictions set out in paragraph 2.1.6 of the 2018 Mining Charter in order for the Mining Right holder to maintain its empowerment credentials.

There are certain procurement targets set out in the 2018 Mining Charter such that in relation to mining goods a minimum of 70% of mining goods procurement spend (excluding non-discretionary spend) must be on South African manufactured goods, with a percentage allocation to 21% to be spent on South African manufactured goods produced by an HDSA, 5% on manufactured goods produced by women or youth owned and controlled companies and 44% to be spent on South African manufactured goods produced by a HDSA compliant company.

In relation to services, 80% of the total spend on services must be sourced from South African based companies. The 80% of the total spend on services must be allocated in the following percentages; 50%, must be spent on services supplied by HDSAs and controlled companies, 15% is to be spent on services supplied by women owned and controlled companies, 5% must be spent on services supplied by youth, and 10% must be spent on services supplied by Broad-Based Black Economic Empowerment (**B-BBEE**) compliant companies. The procurement targets must be progressively complied with, within five years from the date of the granting of the right. In relation to employment equity, a Mining Right holder must within five years, progressively implement the targets set out in the 2018 Mining Charter in relation to board composition, executive management, senior management, middle management, junior management and employees with disabilities. There are also obligations in relation to core and critical skills and career progression plans.

Furthermore, the 2018 Mining Charter deals with obligations in relation to mine community development, housing and living conditions and reporting by Mining Right holders. There is a scorecard for the Broad-Based Socio-Economic Empowerment Charter attached to the 2018 Mining Charter and for measurement purposes the scorecard allocates various weightings to the different elements of the 2018 Mining Charter.

3.1.4. Mineral and Petroleum Resources Royalty Act

[SR1.6(i)]

On 3 June 2008, the fourth and final Mineral and Petroleum Resources Royalty Bill (**2008 Royalty Bill**) was released, for technical comment only. It was enacted as the Mineral and Petroleum Resources Royalty Act on 1 May 2009 (**Royalty Act**).

The Royalty Act imposes a royalty on mining companies in favour of the National Revenue Fund on the transfer of Mineral Resources with effect from 1 March 2010.

Any person holding a Prospecting Right or Mining Right; retention permit; exploration right; mining permit or production permit; or a lease or sublease in respect of such a right; or any person who has recovered a mineral or petroleum resource in South Africa is subject to a levy in terms of the Mineral Royalty Act.

The Royalty Act embodies a formula-derived royalty rate regime since it provides necessary relief for mines during times of difficulties (low commodity prices or marginal mines) and allows the fiscus to share in the benefits during time of higher commodity prices. As the final product can be either refined or unrefined, two separate formulae are given.

Royalties imposed differ between refined and unrefined Mineral Resources but in both instances are based on a percentage of gross sales, derived from a pre-determined formula measuring the ratio of earnings before interest and tax and the gross revenue realised. The Royalty Act allows the holder of a Mining Right to enter into an agreement with the tax authorities to fix the percentage royalty that will be payable in respect of all mining operations carried out in respect of that resource for the life of the mine. The holder may withdraw from such agreement at any time.

The royalty in respect of unrefined minerals is calculated by dividing earnings before interest and taxes ("**EBIT**") by the product of nine times gross revenue of refined mineral resources calculated as a percentage, plus an additional 0.5%. EBIT refers to taxable mining income (with certain exceptions, such as no deduction for interest payable and foreign exchange losses) before assessed losses, but after capital expenditure. A maximum royalty limit of 5% of revenue applies to unrefined minerals.

Both formulae calculate the royalty rate based on a company's earnings before interest and taxes and its aggregate gross sales for the assessment period. The Royalty Act prescribes what EBIT may include and what EBIT must exclude, when applying the formula. For example, capital is considered an allowable deduction for the calculation of EBIT for purposes of the calculation. While the gross sales figure used in the formulae excludes transportation and handling costs, these are considered in the determination of the EBIT figure. The mineral royalty percentage rate (Y%) is based on the following formulae:

Refined Minerals:

$$Y(\%) = 0.5 + \frac{\text{EBIT}}{\text{Gross Sales x 12.5}} \times \frac{100\%}{1}$$

Unrefined Minerals (e.g. coal):

$$Y(\%) = 0.5 + \frac{\text{EBIT}}{\text{Gross Sales x 9.0}} \times \frac{100\%}{1}$$

The maximum percentage rates for refined and unrefined minerals are 5.0% and 7.0% respectively. According to Schedule 2 of the Royalty Act, all grades of coal are deemed unrefined minerals.

The implementation of the Royalty Act commenced on 1 May 2010.

3.1.5. Taxes

[SR1.6(i), SR5.6(vii)]

Corporate Income Tax

Corporate Income Tax (**CIT**) is a tax imposed on companies' resident in the Republic of South Africa, that is those companies that are incorporated under the laws of, or which are effectively managed in the Republic, and which derive income from within or outside the Republic. Non-resident companies which operate through a branch or which have a permanent establishment within the Republic are subject to tax on all income from a source within the Republic. CIT is payable at a rate of 28%.

For the purposes of this CPR, the income taxation determined has been undertaken at the asset level and does not take into consideration any benefits that may or may not accrue from a corporate overlay with regards Corporate Income Tax.

Carbon Tax

The Carbon Tax Act of 2019 (**CTA**) came into effect on 1 June 2019. The carbon tax is imposed on entities in the country that operate emissions generation facilities at a combined installed capacity equal to or above the carbon tax threshold.

In terms of Section 3 of the CTA, a person is liable to pay carbon tax if that person conducts an activity in South Africa resulting in GHG emissions above the defined threshold. A detailed list of activities and sectors, as well as their capacity thresholds and applicable allowances are provided in Schedule 2 to the CTA. Activities carried out at the Group's operations may fall within a number of these categories.

The carbon tax is being introduced in a phased manner, with the first phase running until 31 December 2022. The CTA imposes a carbon tax of ZAR120 per tonne CO_2 equivalent, which will increase annually at a rate of inflation plus 2% until 31 December 2022, and in line with inflation thereafter. The carbon tax liability is calculated as the tax base (sum of GHG emissions from combustion, industrial processes and fugitive emissions in accordance with a reporting methodology approved by the Department of Environment, Forestry and Fisheries, proportionately reduced by certain tax-free allowances) multiplied by the rate of the carbon tax.

A number of transitional tax-free allowances are, however, applicable during the first phase of implementation of the CTA, which aim to ensure a smooth transition to a low carbon economy. Schedule 2 of the CTA sets out the first phase maximum percentages of each permissible allowance for each listed activity conducted.

On 29 November 2019, the Minister of Finance ("**Finance Minister**") gazetted the Regulations on Carbon Offsets under Section 19 of the CTA (Carbon Offsets Regulations). This sees the first material mechanism which allows companies the discretion to reduce their carbon tax liability between 5 to 10 % of their total GHG emissions through investment in a carbon offset programme and has retrospective effect to 1 June 2019. On 19 June 2020, the Finance Minister finalised the next set of regulatory mechanisms applicable to the CTA which included regulations in relation to trade exposure allowance, regulations stipulating greenhouse gas emissions intensity benchmarks for purposes of the performance allowance, and a notice regarding renewable energy premium.

The carbon tax must be levied in respect of the sum of the greenhouse gas (**GHG**) emissions of a taxpayer in respect of a tax period expressed as the carbon dioxide (CO_2) equivalent of those GHG emissions resulting from fuel combustion, industrial processes and fugitive emissions in accordance with the emission factors determined in accordance with a reporting methodology approved by the Department of Environment, Forestry and Fisheries (**DEFF**) (previously known as Department of Environmental Affairs (**DEA**).

Significant industry specific tax-free emissions ranging from 60% to 95% will result in a modest net carbon tax rate ranging from ZAR6 to ZAR48/t of CO_2. It is thus crucial for current emitters to transition their operations to cleaner technologies through investments in energy efficiency, renewables and other low carbon measures.

The calculation of the amount of tax payable is as follows:

$$X = < \{[(E - S) \times (1 - C)] - [D \times (1-M)]\} + \{P \times (1 - J)\} + \{F \times (1 - K)\}> \times R$$

Where:
E = number in respect of the total fuel combustion related greenhouse gas emissions expressed as a CO_2 equivalent;
S = greenhouse gas emissions, expressed in terms of CO_2 equivalent that were sequestrated as verified and certified by the Department of Environmental Affairs;
C = sum of the percentages of allowances determined under sections 7, 10, 11, 12, and 13;
D = petrol and diesel related greenhouse gas emissions expressed as a CO_2 equivalent;
M = sum of the percentages of the allowances under sections 7, 12 and 13;
P = total industrial process related greenhouse gas emissions expressed as a CO_2 equivalent;
J = sum of the percentages of the allowances determined under sections 8, 10, 11, 12 and 13;
F = total fugitive greenhouse gas emissions expressed as a CO_2 equivalent;
K = sum of the percentages of the allowances determined in terms of sections 7, 9, 10, 11, 12 and 13; and
R = represents the rate of tax prescribed (The first phase has a carbon tax rate of ZAR120/t of CO_2 equivalent emissions. This rate will increase annually by inflation plus two per cent until 2022, and annually by inflation thereafter. This was however amended in the 2020 Budget Speech where Carbon tax will increase by 5.6% for the rest of the 2020 calendar year. The carbon tax rate will increase to ZAR127/t of CO_2).

Transaction Taxes

Value Added Tax

Value Added Tax (**VAT**) is levied on “taxable supplies”, which are supplies of goods or services made by a “vendor” in the course or furtherance of an enterprise wholly or partially owned by the vendor in South Africa.

The supply of Mining Right by a vendor is subject to VAT at a rate of 15%. Approval should be sought from the DMRE where Mining Rights are ceded, supplied or transferred to persons.

3.1.6. Mining Legislative Risk

Mining companies in South Africa are exposed to typical mining industry risks associated with rising costs, labour wage demands, resource and social licence to operate. The other risk that has been experienced recently is the reliability of bulk power supply and the power tariff increases which are above the Consumer Price Index (**CPI**). Additional country risk is raised through legislative uncertainty, political interference and bureaucratic ineptitude.

3.1.7. South African Environmental Legislation

This section provides a brief, high-level summary of selected aspects of environmental legislation applicable to the mining industry in South Africa. Colliery-specific information can be found in Section 15.

Environmental Regulations

The following legislation is (among others) relevant in an environmental and heritage context to the operations of a mining company in South Africa:

- The Constitution;
- The MPRDA and the regulations promulgated thereunder;
- The National Water Act No 36 of 1998 (**NWA**);
- The National Environmental Management Act No 107 of 1998 (**NEMA**);
- The National Environmental Management: Air Quality Act No 39 of 2004 (**NEM:AQA**);
- The National Environmental Management: Waste Act No 59 of 2008 (**NEM:WA**);
- The National Heritage Resources Act No 25 of 1999 (**NHRA**), and
- The National Nuclear Regulator Act No 47 of 1999 (**NNRA)**.

All environmental statutes and the common law principles must be viewed within the constitutional framework. The Constitution is the supreme law of South Africa and any law that is inconsistent with its provisions may be declared to be invalid. Section 24 of the Constitution compels the South African government to make legislation and to take other measures to protect the environment, prevent pollution and ecological degradation, promote conservation and secure sustainable development in South Africa.

On 8 December 2014, the 'One Environment System' (**OES**) was implemented in South Africa. The OES introduced a shift in the regulation of environmental matters in the mining and petroleum industries from the MPRDA to NEMA and other environmental statutes. The legislative changes that have been associated with this shift have streamlined the licensing processes for Mining Rights, EAs and Integrated Water Use Licences (**IWUL**). Under the OES, it is clear that an EA is required for the commencement of any activity which requires a Mining Right or Prospecting Right, among others.

Environmental Authorisations

NEMA is the overarching legislation that gives effect to the environmental right protected in Section 24 of the Constitution of South Africa, and which provides the underlying framework and principles underpinning the coordinated and integrated management of environmental activities. In terms of NEMA, an EA is required in order to commence a listed activity. Listed activities in terms of NEMA include, among others, undertaking an activity which requires a Prospecting Right in terms of Section 16 of the MPRDA and any activity including the operation of that activity which requires a mining permit in terms of Section 27 of the MPRDA. These activities are currently listed in GNR 983-985 of 8 December 2014, (as amended) ("**NEMA Listed Activities**"). The commencement of a NEMA Listed Activity without an EA is an offence under NEMA.

Under the OES, the requirement to obtain an Environmental Management Programme or Environmental Management Plan (**EMP**), as the case may be, in terms of the MPRDA has been removed. Prospective rights holders are now required to apply for and obtain an EA under NEMA instead. The Minister of Mineral and Petroleum Resources Development (**Resources Minister**) is the competent authority for issuing EAs and waste management licences (**WML**) in terms of NEMA and NEM:WA, respectively, for prospecting and mining related activities, as well as activities in respect of the primary processing of minerals. The Minister for Environment, Forestry and Fisheries (**Environmental Minister**) remains the appeal authority in respect of any appeals against the issue of an EA or WML. The Environmental Minister is the competent authority for issuing EAs in respect of any non-mining related listed activities. Applicants are also required to follow stringent requirements in the public participation process to enable consultation with all interested and affected parties.

Under the OES, applicants for EAs in terms of NEMA are required to submit an Environmental Management Programme Report (**EMPr**) containing, among others, information on the pre-mining environment; identification and quantification of any potential environmental, economic and social impacts and providing appropriate mitigating measures to minimise any negative impacts caused by the mining operations and enhance any positive impacts.

Water Use Licences

South Africa's water resources are regulated by the NWA. A Water Use Licence (**WUL**) is required in order to undertake any of the water uses which are specified under Section 21 of the NWA; provided that:

- The water use is not generally authorised in terms of the NWA; or
- Is a Schedule 1 use[4]; or
- Constitutes an existing lawful water use in terms of the NWA.

Water uses include, among others: the taking of water from a water resource, the diversion of water courses, mine dewatering, discharge of wastewater and the disposal of waste on land. Most mining operations require a WUL in order to conduct their operations, particularly for activities relating to water abstraction, storage, effluent discharge, diversions, and facilities which have the potential to pollute groundwater resources. WULs are difficult to obtain and usually involve a lengthy and delayed application process.

The Minister of Water, Human Settlements and Sanitation (**Water Minister**) is the competent authority in respect of the issuing of WULs. Regulations in relation to the procedural requirements for WULs and appeals were

[4] Schedule 1 water uses are generally low-volume, low-impact activities that are consistent with domestic use, livestock watering, recreational use and the use of water for emergencies. This water use is permissible and does not require licensing or registration.

published by the Water Minister in 2017. For the first time since the NWA came into force, these regulations provide for specific timeframes and steps to be taken in the processing of a WUL application. Furthermore, the regulations provide for security that may be required to be provided by the applicant to the Department of Water, Human Settlements and Sanitation in relation to a WUL application. Where such security is required, it will be valid for a period of at least five years after the WUL activities have lapsed.

Mines are also required to comply with the regulations which were specifically published for the use of water for mining and related activities in the Government Gazette GNR 704 on 4 June 1999. The regulations provide for limitations on the location of mining infrastructure, requirements for separation of dirty and clean water systems and the design of certain water management infrastructure.

Waste Management Licences

A WML is required in terms of NEM:WA in order to undertake certain waste management activities that are listed in regulations Gazetted by the Environmental Minister. The Environmental Minister may, by notice, in the Gazette, prohibit or restrict the granting of a WML by the licencing authority for a listed activity in a specified geographical area if deemed necessary to ensure the protection of the environment, conservation of resources, sustainable development or human health and well-being.

As a result of the implementation of the OES, mine waste is currently managed in terms of NEM:WA in South Africa. Under NEM:WA, a WML is required for the establishment or reclamation of residue stockpiles or residue deposits resulting from activities which require a Prospecting Right, mining permit, Mining Right, exploration right or production right. This requirement does not apply retrospectively to existing stockpiles and deposits as the relevant transitional provisions appear to suggest that if they were authorised in an EMPr or EMP, as the case may be, in terms of the MPRDA, they will be considered lawful or authorised for the purposes of the Waste Act. In addition to licensing, mines must also comply with the management measures prescribed for residue stockpiles and deposits in the Regulations for Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation in the Government Gazette GNR 632 of 24 July 2015, which impose certain liner/barrier requirements.

This position is anticipated to change once the National Environmental Management Laws Amendment Act Bill (**NEMLAA4**) is enacted as law. One of the main objectives of NEMLAA4 is to address the incongruous treatment of residue stockpiles and residue deposits under the waste and landfill provisions by removing their regulation from the ambit of NEM:WA and placing them under the regulation of NEMA. *Note: as at July 2020, the Select Committee considering the Bill was still to schedule further meetings on this Bill. Bill Progress to be monitored and information to be updated accordingly.*

As of May 2014, NEM:WA also regulates contaminated land, whether or not the contamination occurred before the commencement of NEM:WA or at a different time from the actual activity that caused the contamination. Consequently, historic, as well as present or future arising, contaminated land which is identified as an investigation area by the environmental authorities, or which is notified as being contaminated by the landowner must be assessed and reported on. A directive requiring site remediation may follow depending on the level of risk associated with the contamination.

Atmospheric Emissions Licences

NEM:AQA requires the Environmental Minister to establish a national framework for achieving the objectives of NEM:AQA, which must include, among others, minimum emission standards and norms and standards. An Atmospheric Emissions Licence (**AEL)** is required in terms of NEM:AQA to undertake certain listed activities which are published in terms of NEM:AQA, including, among others, certain mining related and processing activities. Local government is entrusted with the competence to manage air pollution, with municipalities being the licensing authority for purposes of issuing AELs.

The measurement and monitoring of atmospheric emissions is regulated through various tools, such as the air dispersion modelling framework, the declaration of priority pollutants and pollutant areas and the mandatory reporting of data and information from identified point, non-point and mobile sources of atmospheric emissions to the National Air Emission Inventory System. The Department of Environment, Forestry and Fisheries' declaration of greenhouse gases as priority air pollutants in 2017 has been followed by the imposition of a regulatory framework for greenhouse gas emission reporting, which forms the basis and input for imposition of the carbon tax which commenced on 1 June 2019.

Historic and Cultural Heritage

Pursuant to the promulgation of the NHRA, the removal or demolition of any articles of historic or cultural importance requires a permit from the South Africa Heritage Resources Agency or relevant provincial authority, as the case may be. Burial grounds and graves are also protected under the NHRA and a permit is required to destroy, alter or remove such articles.

The National Nuclear Regulator

The NNRA requires that a nuclear authorisation be acquired from the National Nuclear Regulator for certain activities which involve radioactive materials. The authorisation issued can be in the form of either, a nuclear installation licence, nuclear vessel licence, certificate or registration or certificate of exemption. In the case of mining, the duty to obtain a certificate or registration can be triggered when there are trace amounts of radioactive materials in mineral waste, particularly where the reef that is mined contains uranium. The certificate of registration would govern the handling, storage, transportation and disposal of these materials.

Financial Provisioning

Companies undertaking mining activities must make financial provision for rehabilitation liabilities to the satisfaction of the DMRE. This means that the holder must set aside provisioning for rehabilitation of the mining activities for concurrent rehabilitation, rehabilitation upon closure and the costs of managing latent and residual post closure impacts. Financial provisioning for the remediation of environmental damage is regulated in terms of Section 24P of NEMA and the Financial Provisioning Regulations, 2015 (**2015 Provisioning Regulations**).

Section 24P of NEMA provides that an applicant for an EA relating to prospecting, exploration, mining or production must, before the Environmental Minister issues the EA; comply with the prescribed financial provision for the rehabilitation, closure and on-going post decommissioning management of negative environmental impacts.

The 2015 Provisioning Regulations have resulted in significantly increased closure costs compared with the financial provisioning requirements that were previously included in the MPRDA. This is due, in part, to the qualification that latent or residual environmental impacts which may become known in the future now include the pumping and treatment of polluted or extraneous water. The regulation of financial provision is currently in a state of flux and the 2015 Financial Provisioning Regulations are expected to be replaced by a new set of regulations in the near future. A revised draft set of Financial Provisioning Regulations was published in November 2017 and in 2019 (**2019 Provisioning Regulations**), which are yet to be finalised.

Existing rights holders have until June 2021 to ensure that the amount of financial provisioning that is required to be set aside in terms of the 2015 Financial Provisioning Regulations is put forward. Some of the fundamental changes proposed by the 2019 Provisioning Regulations include the imposition of criminal sanctions for financial institutions which fail to notify the various South African government ministries (being the Departments of Environment, Forestry and Fisheries; Mineral Resources and Energy as well as National Treasury) and the holder of a Mining Right, of an intention to cancel or withdraw financial guarantees provided, thus introducing strict liability, and a penalty of up to ZAR10 million and that costs for annual rehabilitation be provided for in the operation budget of applicants and holders of Mining Rights, rather than having to be included in the separate financial provision vehicles provided for.

In relation to mine closures and the issuance of closure certificates, mines will have to comply with the requirements set out in Section 43 of the MPRDA and its corresponding regulations, NEMA and the 2015 Provisioning Regulations. The 2019 Financial Provisioning Regulations will, in relation to mine closures, require the use of financial guarantees for post-closure obligations to remediate and manage residual and latent impacts with a provision for an automatic call up of such guarantees on the issuing of a closure certificate;

Environmental Liability

Mining companies operating in South Africa are subject to extensive environmental laws and regulations with respect to environmental matters. These environmental laws and regulations change frequently and are generally becoming more stringent, and the costs associated with compliance with the laws and regulations are substantial.

The requirements of NEMA are far reaching, particularly Section 28 thereof (commonly referred to as "the duty of care provision"), which provides that every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable steps to prevent such pollution or degradation from occurring, continuing or recurring, or insofar as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. It is arguable that Section 28 of NEMA may have introduced the principle of strict liability with respect to the causation of environmental impacts.

A similar duty of care exists under the NWA, in terms of which the owner of land and controllers or occupiers of land on which any activity or process is or was performed that causes, has caused or is likely to cause the pollution of a water resource, must take all reasonable measures to prevent such pollution from occurring, continuing or recurring. The Department of Water, Human Settlements and Sanitation may issue administrative directives to the abovementioned persons to take reasonable measures to prevent pollution from occurring, continuing or recurring where such measures have not been taken. The Department of Environment, Forestry and Fisheries may similarly issue directives against persons who fail to comply with the Section 28 duty of care under NEMA. In addition to this, these authorities can order the suspension of part or all of a company's operations for non-compliance. Contravention of NEMA and the NWA is an offence and an offender may be liable for significant penalties in the form of a fine and/or imprisonment.

A person may also be held liable for pollution and/or environmental harm caused by it during mining operations notwithstanding the cessation of mining activities, the issuance of a closure certificate and or the sale or transfer of the mining operation. This liability arises in terms of the duty of care provisions under NEMA and the NWA.

Furthermore, Section 24R of NEMA provides that every holder, holder of an old order right and owner of works remains responsible for any environmental liability, pollution or ecological degradation, the pumping and treatment of polluted or extraneous water, the management and unsustainable closure thereof notwithstanding the issuing of a closure certificate by the Resources Minister in terms of the MPRDA to the holder or owner concerned. This position also applies where an asset has been sold or otherwise transferred to a third party. The previous owner/operator will remain liable for any remediation or avoidance of further pollution as a result of pollution caused by it during its operations. This liability also arises from the duty of care to avoid, mitigate and rehabilitate pollution or environmental degradation established in terms of Section 28 of NEMA and Section 19 of the NWA.

The National Environmental Management Act (Act No 107 of 1998)

NEMA is regulated by the DEFF (previously known as the DEA). Responsibility for the implementation of NEMA is generally delegated to the relevant provincial environmental departments. This Act over-arches South African environmental legislation and lays down basic environmental principles including duty of care, polluter pays and sustainability.

NEMA provides for co-operative environmental governance based on the principles that everyone has the right to an environment that is not harmful to one's health or well-being and enabling the administration and enforcement of other environmental management laws. Sections 28 (1) and (3) of NEMA set out the duty of care principle, which is applicable to all types of pollution and must be considered in considering any aspects of potential environmental degradation.

Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. A series of regulations have been promulgated in terms of NEMA including:

- NEMA EIA Regulations, 2014: These regulations were developed for the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations; and
- NEMA Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015: The purpose of these regulations is to regulate the determine and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. The regulations also include detailed descriptions of the wording required in the documentation to support the provisioning for liability using

Bank Guarantees and Trust Funds. It also provides detailed on the information to be contained in the following plans: annual rehabilitation plan; final rehabilitation, decommissioning and mine closure plan; environmental risk assessment report; and care and maintenance plan.

National Environmental Management: Waste Act (Act No 59 of 2008)

The National Environmental Management: Waste Act (**NEM:WA**) came into effect on 1 July 2009 and seeks to encourage the prevention and minimization of waste generation, whilst promoting reuse and recycling of the waste and only consider disposal of waste as a last resort. It provides for the licensing of waste management activities. A series of regulations have been promulgated in terms of NEM:WA including:

- NEM:WA Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits (2015): These regulations specify the design approach and considerations for Residue Stockpiles and Residue Deposit (RSRD). They also specify that these facilities must comply with the Norms and Standards;
- NEM:WA Waste Classification and Management Regulations: These regulations require that waste generators must ensure that the waste they generate be classified in accordance with SANS 10234 within 180 days of generation (Chapter 2, 4(2)). If the waste is to be disposed of to landfill, the waste must be assessed in accordance with the Norms and Standards for Assessment of Waste for Landfill Disposal (Chapter 2 (8)1) (a); and
- NEM:WA National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (2014): The purpose of these norms and standards is to: provide a uniform national approach to determine the contamination status of an investigation area; limit uncertainties about the most appropriate criteria and method to apply in the assessment of contaminated land; and provide minimum standards for assessing necessary environmental protection measures for remediation activities.

The National Environmental Management: Waste Amendment Act (Act No 26 of 2014)

The National Environmental Management: Waste Amendment Act (**NEM:WAA**) came into effect on 2nd September 2014. In terms of this Act, Schedule 3 was amended to include mining residue deposits and stockpiles as hazardous waste. The intention of the amendment is that residue deposits and stockpiles will now be regulated in terms of NEM:WA. For new waste facilities a Waste Management Licence (**WML**) may be required under NEM:WAA. Mine residues are excluded from the Act, but the disposal of other wastes on a mine, for example general wastes, would need to be licensed if no Section 20 permit is in place. If a mine subcontracts waste disposal, the subcontractor must be in possession of the appropriate permit/licence.

National Environmental Management: Air Quality Act (Act No 39 of 2004)

NEM:AQA regulates atmospheric pollution and repealed the Atmospheric Pollution Prevention Act. The Act came into full effect on 1 April 2010 and entrusts the DEFF with the task of preventing pollution and ecological degradation, while at the same time promoting justifiable economic and social development. Metropolitan and District Municipalities are charged with issuing atmospheric emission licenses for certain listed activities. It must be shown that the best practical means are being employed to limit air pollution before these certificates will be issued. Penalties and criminal sanctions are imposed for non-compliance with NEM:AQA. On 1 April 2010, the DEFF established a list of activities, which require atmospheric emission licenses. The Department has published the minimum emission standards resulting from these listed activities. These include the permissible amount, volume, emission rate or concentration of that substance or mixture of substances that may be emitted into the atmosphere and the manner in which measurements of such emissions must be carried out. The consequences of the listing of these activities is that no person may, without a provisional atmospheric emission licence or an atmospheric emission license, conduct an activity listed on the list anywhere in the Republic or listed on the list applicable in a province anywhere in that province. The National Greenhouse Gas Emission Reporting Regulations (**NGER**), under section 53(A), (o) and (p) of NEM:AQA, were instituted in 2017 (General Notice Regulation (**GNR**) 275 of 2017). The regulations provide a list in Annexure 1 of activities and operations that are required to report their GHG emissions through a national system. NGER classifies data providers as follows:

- Category A: any person in control of or conducting an activity marked in the Category A column above the capacity given in the threshold column of the table in Annexure 1 to these Regulations; and

- Category B: any organ of state, research institution or academic institution, which holds GHG emission data or activity data relevant for calculating GHG emissions relating to a category identified in the table in Annexure 1 to these Regulations.

If the Colliery conducts any activity equal to or above the thresholds specified in Annexure 1 of NGER, it will be considered as a Category A data provider and hence will have to register as a data provider and report to the Competent Authority by 31 March every year. Monitoring and reporting should cover all process, fugitive and combustion emissions from all greenhouse gas emission sources and source streams belonging to activities listed in Annexure 1 of NGER. It is recommended that the Colliery reviews their current operations to ensure they are below the specified thresholds relating to stationary combustion, fugitive emissions from fuel, incineration of waste, and wastewater treatment and discharge.

National Water Act (Act No 36 of 1998)

The NWA is regulated by the Department of Human Settlements, Water and Sanitation (**DHSWS**, previously known as the DWS). Chapter 4 of the NWA stipulates that water uses (abstraction, storage, waste disposal, discharge, removal of underground water and alteration to watercourses) must be licensed. There are transitional arrangements to enable permits under the former 1956 Water Act to be converted into water use licences (**WULs**). The Act also has requirements relating to pollution control, protection of water resources (Regulation 704 relates to mines), dam safety (for dams with a capacity greater than 50 000 m^3 and a dam wall higher than 5 m) and water-use tariffs.

National Heritage Resources Act (Act No 25 of 1999)

This Act is regulated by South African Heritage Resource Agency or relevant Provincial departments where these have been established. This Act controls sites of archaeological or cultural significance. Such sites must be investigated and, where necessary, protected for the nation. Procedures for the relocation of graves are also given.

National Environmental Management: Biodiversity Act (Act No 10 of 2004)

The National Environmental Management: Biodiversity Act (**NEM:BA**) seeks, amongst other things, to manage and conserve biological diversity, to protect certain species and ecosystems, to ensure the sustainable use of biological resources and to promote the fair and equitable sharing of benefits arising from bio-prospecting involving those resources. The NEM:BA includes a regulation related to the management of threatened and protected species. A similar regulation is applied to Threatened Ecosystems. NEM:BA has a set of norms and standards for the development of management plans for both species (e.g. Threatened or Migratory Species) and ecosystems (Endangered or Critically Endangered).

National Environmental Management: Protected Areas Act (Act No 57 of 2003)

Protected areas such as nature reserves and special nature reserves are declared and managed in terms of the National Environmental Management: Protected Areas Act (**NEM:PAA**). Depending on the nature of the protected area, certain activities (such as mining) may require Ministerial consent or be prohibited outright. The Act also aims to promote the sustainable use of protected areas and the participation of local communities in such areas. In addition, it provides for the continued existence of the South African National Parks.

National Forests Act (Act No 84 of 1998)

The National Forests Act (**NFA**) is enforced by DAFF. The NFA supports sustainable forest management and the restructuring of the forestry sector, as well as protection of indigenous trees in general.

Environmental Conservation Act (Act No 73 of 1989)

The Environmental Conservation Act (**ECA**) is regulated by DEFF and DHSWS. The waste sections of this Act (Section 20) were repealed and replaced by the NEM: WA, which came into effect on 1 July 2009.

Hazardous Substances Act (Act No 15 of 1973)

This Act is regulated by the Department of Health and controls the declaration of hazardous substances and control of declared substances. It allows for regulations relating to the manufacturing, modification, importation, storage, transportation and disposal of any grouped hazardous substance.

Mine Health and Safety Act (Act No 29 of 1996)

The Mine Health and Safety Act (**MHSA**) and amendments are regulated by the DMRE. This Act deals with the protection of the health and safety of persons in the mining industry but has some implications for environmental issues due to the need for environmental-health monitoring within mine operations.

3.2. Broad-Based Black Economic Empowerment

3.2.1. B-BBEE/Historically Disadvantaged South Africans Ownership of Rights

The Company's BEE/Historically Disadvantaged South African (HDSA) ownership calculation methodology is derived from Code 100 Statement 102 of the B-BBEE Codes issued under the Broad-Based Black Economic Empowerment Act No 53 of 2003 read together with the Mining Charters of 2004, 2010 and 2018. In accordance with that methodology, it is possible for the value of assets disposed of into black ownership to exceed the value of the selling company, thereby producing a recognisable ownership equivalency in excess of 100%.

The MPRDA seeks to facilitate participation by HDSAs in the mining industry. Complying with the B-BBEE requirements and HDSA regime set by the South African government is a prerequisite for the grant of Prospecting and Mining Rights. Every application for a Mining Right under the MPRDA must demonstrate that the granting of such right will:

- Substantially and meaningfully expand opportunities for HDSAs, including women, to enter the mineral and petroleum industry in order to benefit from the exploitation of South Africa's mineral and petroleum resources; and
- Promote employment and advance the social and economic welfare of all South Africans.

Pursuant to the MPRDA, the Resources Minister developed Mining Charter I (**MCI**). MCI required that mining companies achieve 15% HDSA ownership of mining assets by 2009 and required that mining companies achieve a minimum target of 26% HDSA ownership of mining assets by 2014. MCI and its scorecard were amended by the Resources Minister on 13 September 2010 - Mining Charter II (**MCII**).

On 4 April 2018, the High Court of South Africa, Gauteng Division, Pretoria handed down a landmark judgment in the matter between the *Chamber of Mines of South Africa versus the Minister of Mineral Resources and Another* (case number 41661/2015), in which it was found as follows:

- Once the Resources Minister or his/her delegate is satisfied in terms of Section 23(1)(h) of the MPRDA that the grant of a Mining Right applied for in Section 22 will further the objects of the MPRDA referred to in Section 2(d) and (f) in accordance with the applicable Charter, the holder thereof is not legally obliged to restore the percentage ownership, however measured, controlled by HDSAs to the 26% target referred to in MCI and MCII where such percentage falls below 26%, unless such obligation is specified as an obligation in terms of the conditions stated in the right;
- A failure by a holder of a Mining Right or converted Mining Right to meet the requirements of MCI and MCII does not constitute a breach of a material term or condition of the Mining Right for the purposes of Section 47(1)(a) of the MPRDA, and further does not constitute an offence, for purposes of Section 98(a)(viii), read with Section 99, unless an obligation to meet such a requirement is specified as an obligation in the terms and conditions; and
- Neither MCI nor MCII require the holder of a Mining Right to enter into further HDSA empowerment transactions to address losses in participation ownership once it has been achieved, unless otherwise specified.

Although the High Court's decision in this matter remains unchallenged, it may still be taken on appeal or review and thus subject to change.

The Broad-Based Socio-Economic Charter for the Mining and Minerals Industry, 2018 was published on 27 September 2018 - Mining Charter III (**MCIII**). MCIII regulates six elements, namely:

- Ownership;
- Mine community development;
- Employment equity;
- Procurement, supplier and enterprise development; and
- Housing and living conditions and human resource development.

On 27 March 2019, the Minerals Council South Africa applied for a judicial review of certain elements of the Mining Charter III, primarily citing challenges to provisions relating to continuing consequences of previous empowerment transactions. This review is still pending.

An existing Mining Right holder who achieved a minimum of 26% B-BBEE shareholding shall be recognised as compliant for the duration of the Mining Right. This recognition is not applicable upon renewal of the right and is not transferrable to a new owner in the case of a transfer or sale of a Mining Right. The renewal of an existing Mining Right will be subject to the MCIII requirements which are applicable at the time that the Mining Right renewal application is lodged.

In the event that a Black Economic Empowerment (**BEE**) Entrepreneur's shareholding is disposed of, a Mining Right holder's empowerment credentials will be recognised for the duration of the Mining Right where:

- The holder has complied with the requirements of MCIII at the time of such disposal;
- The BEE Entrepreneur has held empowerment shares for at least a third of the duration of the Mining Right;
- The recognition of the empowerment credentials will only be applicable to measured effective ownership which vested in the BEE shareholder; and
- An agreement detailing exit mechanisms and the BEE shareholders' remaining financial obligations constituting a contract between the Mining Right holder and BEE shareholders is submitted to the DMRE.

The recognition of consequences of previous transactions shall not be claimed against future Mining Rights or Mining Right renewal applications.

The Company is able to claim the equivalent of an 109.9% BEE/HDSA shareholding in it by virtue of prior empowerment deals, as summarised in Table 3-1. The equivalent BEE/HDSA shareholding in the empowerment deals is premised on the percentage of production tonnes transferred relative to the Company's remaining production tonnes or the percentage of resource tonnes transferred relative to the remaining resource tonnes held by the Company. The formula for the claim is:

$$A / (A + B),$$

<u>Where:</u>
A = production/resources transferred; and
B = the Company's remaining production/resources.

Table 3-1: Prior BEE/HDSA Empowerment Deals

Transaction	Date	Metric	Asset Units (Mt)	Units Transferred (Mt)	Equivalent Ownership Claimed (%)	Source Documents/ Comments
Leeuw Mining	May 2003	Resource	145.7	145.7	3.6%	WW
Phembani	2003	Resource	1.9	1.9	0.0%	WW
Mafube	2006	Production	1.1	0.5	0.9%	AA AFS 2005 (p117)
AAIC – Kriel	2010	Production	11.2	3.0	5.1%	AA AFS 2009 (p174)
AAIC – Elders	2010	Resource	293.0	79.1	3.3%	AA AFS 2009 (p168)
AAIC – Zibulo	2010	Resource	372.9	100.7	4.1%	AA AFS 2009 (p167)
AAIC – New Largo	2010	Resource	675.6	182.4	7.5%	AA AFS 2009 (p168)
AAIC – Heidelberg	2010	Resource	338.6	91.4	3.8%	AA AFS 2009 (p168)
Wonderfontein	2012	Resource	75.0	75.0	2.8%	AA AFS 2011 (p188)
Panfontein	2013	Resource	281.0	281.0	10.1%	AA Transformation Report 2012 (p54)
Rietvlei	Jan 2015	Resource	42.0	42.0	1.5%	
Siyaphambili ESOP	2008	Free Shares	-	-	0.1%	Of AAC plc capitalisation
Seriti – Kriel	Mar 2018	Production	5.4	3.9	7.9%	AA AFS 2017 (p200)
Seriti – New Vaal	Mar 2018	Production	15.1	15.1	30.3%	
Seriti – New Denmark	Mar 2018	Production	3.4	3.4	6.7%	
New Largo	Aug 2018	Resource	571.6	417.3	16.3%	Ore & Res 2017 (p37)
PIC investment	2019	Shares	-	-	6.1%	In: Anglo plc (Letter MCIII 2019 Ed)
Total					**109.9%**	

Note:
1. AAIC = Anglo American Inyosi Coal (Pty) Ltd.
2. ESOP = Employee Share Ownership Plan.

Apart from Exxaro's 50% shareholding held in the Mafube Colliery and Anglo American Inyosi Coal (Pty) Ltd's (**AAIC**) 27% shareholding in the Zibulo Colliery, the Company far exceeds the BEE/HDSA ownership requirements of the MPRDA and MCIII. The DMRE has confirmed that the equivalent BEE shareholding as calculated per Table 3-1 is acceptable and fully satisfies the required BEE/HDSA shareholding/ownership requirements.

3.2.2. B-BBEE Scorecard

All mining companies in South Africa are required to report their mining scorecard against the B-BBEE requirements set out in the MCIII. The snapshot of Greenside's performance against the B-BBEE scorecard is summarized in Table 3-2.

Table 3-2 shows that Greenside fully complies with the MCIII requirements for mine community development and housing and living conditions. With regards employment equity and procurement supplier, Greenside's performance meets between 50% and 100% of the MCIII requirements.

Table 3-2: Greenside Colliery– B-BBEE Scorecard Performance

MCIII Pillars	Weighting	Score	Results (Shortfall against Target)
Ownership			
Existing rights	Y/N	N/A	OK
New rights	Y/N	N/A	OK
Pending applications	Y/N	N/A	OK
Mine Community Development	Y/N	Y[1, 2]	OK
Housing and Living Conditions	Y/N	Y[1, 2]	OK
Employment Equity	30%	23.5%[3]	(6.5%)
Procurement Supplier and Enterprise Development	40%	34.4%[3]	(5.6%)
Human Resource Development	30%	7.9%[4]	(22.1%)
Total	**100%**	**65.8%[3]**	**(34.2%)**
Meet all ring-fenced elements		Yes	
MCIII Level (DMRE Scorecard)		4	
Final Result		Compliant	

Notes:
1. Meets ring-fenced MCIII pillar requirements.
2. Complies 100% with MCIII pillar requirement.
3. Between 50% and 100% MCIII requirement met.
4. Less than 50% MCIII requirements met.

Source: Mining Charter Reporting 2020 March.pptx.

Greenside's performance regarding human resource development falls below the 50% target of the MCIII requirements. Nevertheless, Greenside satisfies Level 4 on the DMRE Scorecard, i.e. ring-fenced elements + 60 - 70%, and is therefore compliant with the B-BBEE requirements of the MCIII.

3.3. Greenside Colliery Title and Rights

[12.10(h)(iv)] [SR1.5] [SV1.5] [ESG4.1]

3.3.1. Mining and Prospecting Rights

Three granted and executed New Order Mining Rights (**NOMR**s) cover the GAR (Table 3-3, Figure 3-1 and Figure 3-2), giving the Company the exclusive right to mine and recover coal in, on or under the mining areas listed below:

- Landau Mining Right: MP 30/5/1/2/2/306 MR
- Greenside Mining Right: MP 30/5/1/2/2/304 MR
- Kleinkopje Mining Right: MP 30/5/1/2/2/307 MR

The Company owns 100% of the Mining Rights. These NOMRs may be renewed, provided application is lodged timeously with the correct authority and in compliance with the terms and conditions of the existing MR. The application should not be in contravention of any relevant provision of the MPRDA or any other law, the MWP, requirements of the SLP and conditions of the environmental authorisation. Such a NOMR will remain in force until the application has been granted or rejected. Periods of renewal may not exceed 30 years at a time.

One granted, executed and registered New Order Prospecting Right (MP 30/5/1/1/2/184 PR) covering 17.1306 ha is located on Portions 8 and 11 of the farm Vlaklaagte 330 JS (Table 3-3 and Figure 3-1) giving the Company the exclusive right to prospect for coal. The renewed Prospecting Right expired on 31 March 2018; however, an application to convert it to a MR (MP 30/2/1/2/2/10199 MR) was lodged with the DMRE on 18 February 2018 and is pending approval. These rights are considered to be separate from the Greenside 304 MR regarding natural, human and economic resources.

Table 3-3: Mining and Prospecting Rights covering the GAR

Name	Number	Rights Type	Area (ha)	Grant Date	Expiry Date	Seams in GAR
Landau	MP 30/5/1/2/2/306 MR	Mining	12 858.5798	31/07/2008	30/07/2029	No 5 Seam
Greenside	MP 30/5/1/2/2/304 MR	Mining	4 304.3668	05/05/2008	30/07/2034	No 5 Seam, No 4 Seam, No 2 Seam, No 1 Seam
Kleinkopje	MP 30/5/1/2/2/307 MR	Mining	7 152.0349	03/11/2009	02/11/2030	No 4 Seam
Vlaklaagte	MP 30/5/1/1/2/184 PR	Prospecting	17.1306	01/04/2015*	31/03/2018	No 4 Seam, No 2 Seam, No 1 Seam
	MP 30/5/1/2/2/10199 MR	Mining Right application	17.1306	18/02/2018	Submitted; pending	No 4 Seam, No 2 Seam, No 1 Seam

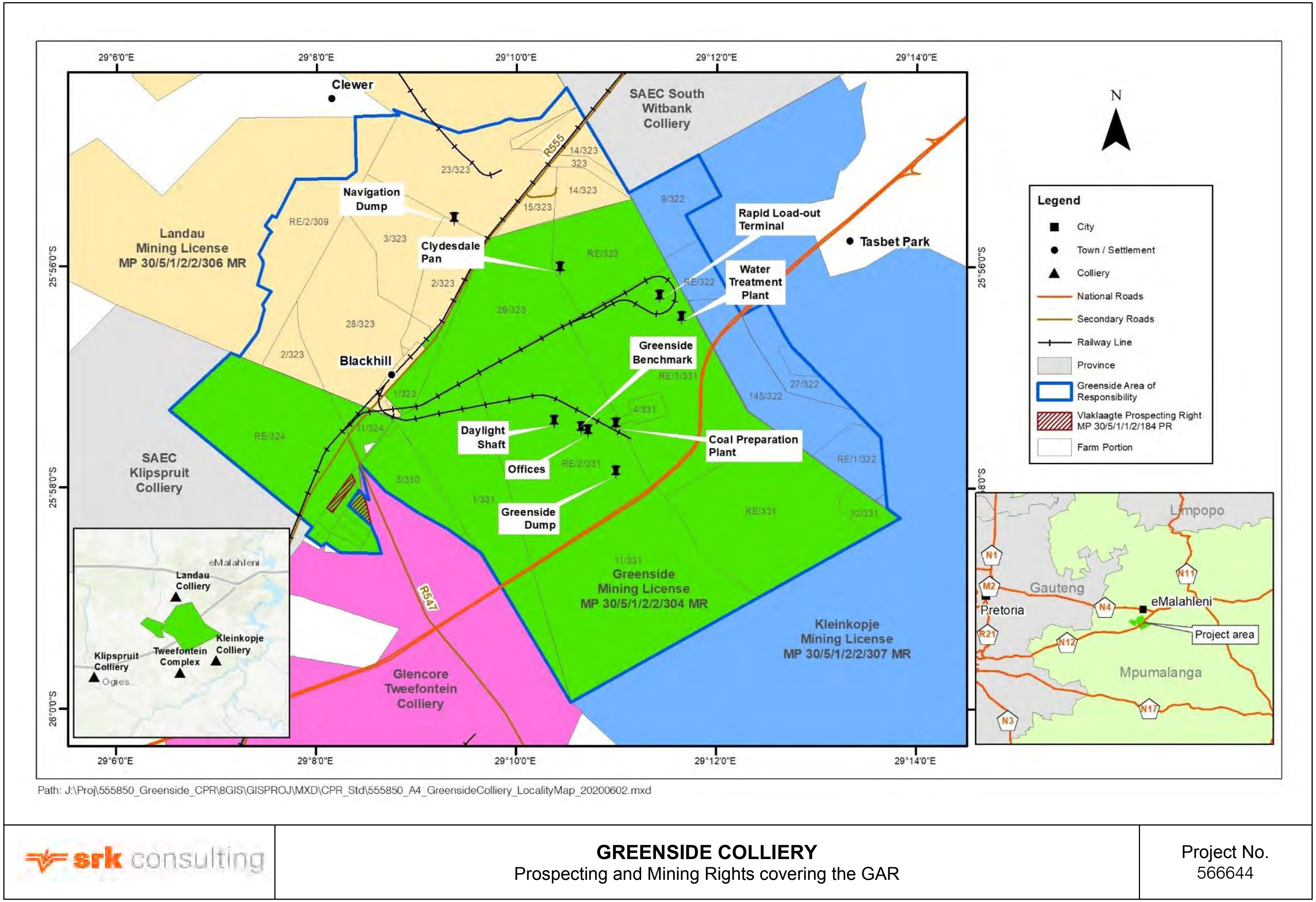
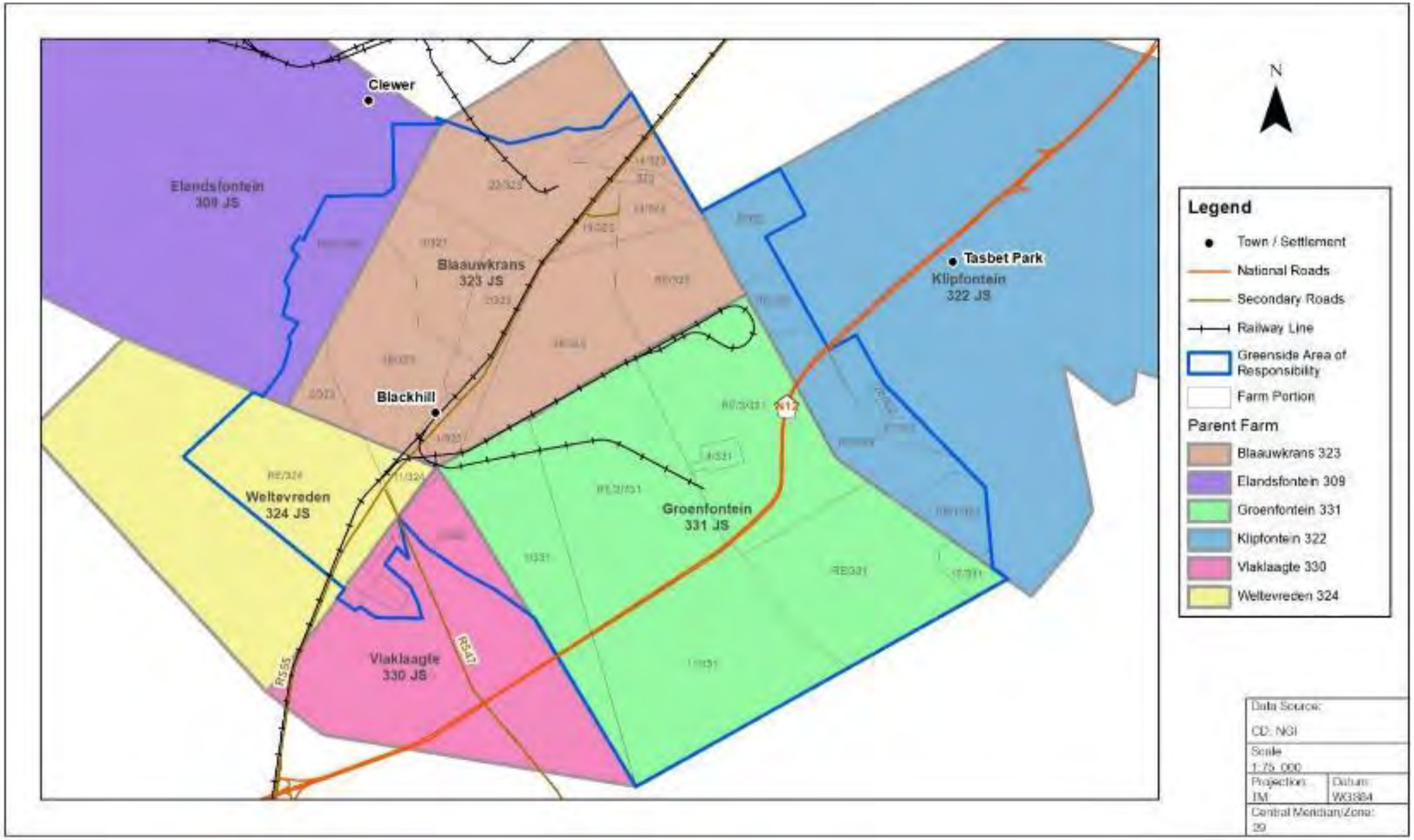


Figure 3-1: Prospecting and Mining Rights covering the GAR



srk consulting	**GREENSIDE COLLIERY CPR** Farms covering the GAR	Project No. 566644

Figure 3-2: Farms covering the GAR

The portions of the Khwezela North and South MRs that are included in the GAR are shown in Table 3-4.

Table 3-4: Portions of the Khwezela North and South Mining Rights included in the GAR

Mining Right	Farm	Portion	Area (ha)
Landau	Blaauwkrans 323 JS	RE/2	114.7528
MP 30/5/1/2/2/306 MR		2	60.6177
Total area = 2 321.0306 ha		3	201.2931
		7	0.2887
		10	0.1276
		14	68.2939
		15	59.0024
		RE/14	29.7556
		RE/15	33.902
		23	30.4248
		28	373.4842
		29	427.944
		RE/23	611.6752
		RE	13.1102
	Elandsfontein 309 JS	RE/2	296.3854
Kleinkopje	Klipfontein 322 JS	1	88.328
MP 30/5/1/2/2/307 MR		9	132.7581
Total area = 610.8817 ha		27	82.1871
		28	16.6405
		145	227.7086
		167	1.3957
		RE	61.8637

The multiple NOMRs covering the GAR result from the Company's strategy of resource optimisation for SACE; the strategy aims to ensure profitable mining of all the coal resources in the complex under the most appropriate MR. The mining of the resources in the different NOMRs is controlled through internal Company agreements, which allow the different SACE mines to mine within each other's NOMRs. The Company's Mineral and Property Rights Department has engaged with the DMRE to formalise the agreements as these impact on the MHSA appointments. This needs to be addressed via Section 102 amendments.

A Section 102 amendment is an application in terms of Section 102 of the MPRDA to amend the permits, programmes or plans pertaining to a particular piece of land, already covered under a different Right. The consent of the Minister of the DMRE is required to implement these amendments.

Greenside is in the process of initiating a Section 102 application to include portions of the farm Klipfontein 322 JS into the Greenside NOMR. These currently fall under the Kleinkopje NOMR (307MR). It is uncertain whether this application has been submitted to the DMRE.

Note that within the GAR, the Landau NOMR applies to the uppermost No 5 Seam only, while the Greenside and Kleinkopje NOMRs apply to the lower No 4, 2 and 1 Seams and the No 4 Seam, respectively.

Portion 3 of Vlaklaagte 330 JS (Table 3-4), which formed part of Glencore's Waterpan Section of Tweefontein Colliery (MP 30/5/1/2/2/289 MR), was transferred to the Company through a swop agreement between the two companies via a Section 102 application. This ground was included in the amended Greenside MR, submitted to the DMRE in 2014 (executed and registered).

3.3.2. Surface Rights

The Surface Rights are currently owned by twelve different entities, the surface details of which are included in Table 3-5.

Table 3-5: Surface Rights

Farm Name and Number	Surface Owner	Farm Subdivision	Deed	Area (ha)	Portion Applied for
Vlaklaagte 330 JS	Adistra 96 cc	13	T10667/2008	8.5654	8.5654
Blaauwkrans 323 JS	Anglo Operations (Pty) Ltd (**AOPL**)	Ptn of 1	T120749/1999	11.3448	0.1934
		RE/10	T521/1955	0.0932	0.0874
		Ptn of Ptn 29	T62135/2007	333.3047	235.7814
		R/14		112.3667	18.482
		Ptn of RE/15	T60512/2004	96.6095	
Groenfontein 331 JS	AOPL	RE/	T120749/1999	654.8486	654.8486
		2		1254.6278	1254.6278
		3		636.75	636.75
Vlaklaagte 330 JS	RM Botha	7	T74097/1992	4.0318	4.0318S
		14	T138772/2007	8.5654	8.5654
Vlaklaagte 330 JS	PSJ Duvenhage	12	T168581/2004	8.5656	8.5656
Weltevreden 324 JS	Inyanda Mining Holdings Pty. Ltd.	10	T13838/2017	14.0328	14.0328
Vlaklaagte 330 JS	DF Liebenberg	15	T13499/2017	8.5656	8.5656
Vlaklaagte 330 JS	M Louw	9	T128187/2004	8.5655	8.5655
Vlaklaagte 330 JS	Praysa Trade 1130 Pty. Ltd.	Ptn of 2	T11609/2013	232.8016	3.7538
Vlaklaagte 991 JS	Praysa Trade 1130 Pty. Ltd.	Ptn of RE/	T11611/2013	996.1064	439.8166
		Ptn of RE?		996.1064	123.6934
Groenfontein 331 JS	South African National Roads Agency Ltd.	5	T751/2005	18.0986	18.0986
		6		4.0318	4.0318
Blaauwkrans 323 JS	Transnet Ltd.	16	T14533/1957	1.8482	1.8482
		19	T15349/1961	0.0149	0.0139
Weltevreden 324 JS	Transnet Ltd.	1	T27631/1964	0.7437	0.7437
		9	T6056/1969	6.8367	6.8367
Weltevreden 324 JS	Truter Boerdery Trust	Ptn of RE/	T13086/2010	526.4489	523.9587
				526.4489	2.4901
Vlaklaagte 330 JS	JP Twala	10	T14/2012	8.5656	8.5656

Numerous portions of the surface rights of the Company-owned farms Groenfontein 331 JS, Blaauwkrans 323 JS and Elandsfontein 309 JS are leased to a number of tenants, for agricultural or business purposes (Table 3-6). A total of approximately ZAR725 000 in fees is collected annually.

Table 3-6: Surface Rights Leases

Lessee	Farm	Parts in Portion	Area (ha)
ATC South Africa Wireless Infrastructure (Pty) Ltd	Groenfontein 331 JS	RE/2	144 m^2
Draaihoek Safaris (Pty) Ltd	Groenfontein 331 JS	Parts of 2	201.8951
GJ Smith	Blaauwkrans 323 JS	2, 3, 7, 14, 23, 28, 29	1 846.0167
	Groenfontein 331 JS	RE, 2, 3	
	Elandsfontein 309 JS	2, 22	
GS Truck and Crane Hire cc	Groenfontein 331 JS	RE, 3	1 057.5762
Perennial Harvest	Groenfontein 331 JS	RE, 2, 3	511.4488
Vodacom	Groenfontein 331 JS	2	80 m^2
Dries Cronje Boerdery BK	Nooitgedacht 37 IS	14	81.5587

3.3.3. Sufficiency of Rights

[12.9(e)] [12.10(h)(iv)] [SR1.1(ii)]

Greenside has an arrangement with neighbouring Khwezela Colliery to mine some of the coal covered by the Kleinkopje and Landau Mining Rights. This is a practical arrangement to ensure the most appropriate mining of the coal. Together with the Greenside Mining Right and the Vlaklaagte Mining Right application and Prospecting Right, the area to be mined is sufficiently covered by granted and executed Mining Rights.

The Company owns the surface rights in areas where there is colliery surface infrastructure, although some of this land is leased to tenants.

The colliery has submitted a consolidated WUL application to include all previously issued licences; approval is awaited.

3.4. Legal Aspects and Permitting

3.4.1. Environmental Authorisations and Licences

[SR1.5(ii)(v), SR5.5(i)(ii)(iii)] [ESG4.3]

Water Use Licences

Since receiving the original WUL, the following licences have been issued to Greenside for water use related activities:

- Greenside Integrated WUL in terms of Chapter 4 of the National Water Act, 1998 (Act No 36 of 1998) approved 19 July 2011 (Licence No.: 04/B11G/AEGJ/1197) by the Department of Water Affairs (**DWA**) (now the DHSWS). This licence was amended 28 March 2019 to factor in several amendments to conditions contained in the 2011 licence;
- Greenside 3A North Dump WUL in terms of Chapter 4 of the National Water Act, 1998 (Act No 36 of 1998) approved on 22 February 2019 (Licence No.: 06/B11G/CGI/8851) by the DWS (now the DHSWS);
- Greenside Retreatment Plant WUL in terms of Chapter 4 of the National Water Act, 1998 (Act No 36 of 1998) approved on 25 August 2015 (Licence No. 04/B11G/CGI/3730) by the DWS (now the DHSWS). This licence was amended to alter two Section 21(c) and (i) conditions and delete four 21(g) conditions which appeared in the original licence. This amendment was approved on 4 July 2018;
- Greenside Pollution Control Dam WUL in terms of Chapter 4 of the National Water Act, 1998 (Act No 36 of 1998) approved on 7 February 2014 (Licence No.: 04/B11G/G/2219) by DWA (now the DHSWS). This licence was amended and approved on 4 July 2018 to factor in several amendments to conditions contained in the 2014 licence; and
- Greenside GNR704 Exemption (4b) for the undermining of Clydesdale Plan Approved 19 February 2012 (Exemption number: 16/2/7/B100/C80)

As of July 2019, Greenside was in the process of undertaking a consolidated WUL application to include a consolidation of the 2017 WUL and all existing lawful water uses including all GNR704 exemptions. The Environmental Coordinator confirmed that the amended WUL has been submitted but that they are still awaiting approval. Greenside were requested to submit additional information in support of the WUL consolidation application on 09/10/2020 and it is the opinion of the Environmental Coordinator that the approval is imminent. SRK has not had sight of the amended WUL documentation.

Mine Waste Disposal

The mine generates domestic waste, scrap waste, waste tyres and hazardous waste, which are all managed in line with Greenside's Environmental Waste Management Procedure (AATC025436, Version Number 17 *cf.* Table 15-2). This procedure requires that the different categories of waste are disposed in a manner that aligns with legislative requirements. Based on discussions with operation staff and Environmental Management Programme Report (**EMPr**) conditions (WSP, 2014; Shangoni, 2017; and pers. comm., E. Prinsloo, 2019), the following takes place in terms of solid waste management:

- General waste is disposed of in marked bins and is collected by a contractor who then disposes of the waste at the eMalahleni municipal waste disposal site;
- Garden refuse is disposed of in an on-site compost heap for reuse in the gardens;
- Waste oil is collected in drums and removed by a specialist water contractor; and
- Beneficiation plant residue is disposed of at the colliery's coal discard and slurry disposal facility.

The mine is registered as a waste producer. However, they do not have a waste management licence in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008) as this is not required.

3.4.2. Environmental and Social Approvals

[SR1.2(ii), SR1.5(ii)(iv)(v), SR7.1] [ESG4.3]

Environmental Management Programme

The following environmental approvals are applicable to Greenside:

- EMPr for Greenside: Nooitgedacht Underground Mine approved on 1 March 2000 by the then Department of Minerals and Energy (DME);
- EA for a Pollution Control Dam approved on 15 August 2011 by the Department of Economic Development, Environment and Tourism (Ref No: 17/2/3 N-17);
- Greenside Pollution Control Dam EMPr approved on 10 December 2012 by the DMRE (Ref No.: MP 30/5/1/2/3/2/1 (304) EM);
- EA for the construction of a coal discard dump retreatment plant approved on 5 December 2013 by the Department of Economic Development, Environment and Tourism (Ref No: 17/2/3 N-165);
- Greenside EMPr for the construction of a coal discard dump retreatment plant approved on 5 December 2013 by the DMRE (Ref No: MP 30/5/1/2/3/2/1 (304) EM);
- Greenside Aligned EMPr Approved on 2 December 2014 by the DMRE (Ref No: MP 30/5/1/2/3/2/1 (304) EM);
- Greenside Thandeka Shaft EMPr approved on 23 December 2015 by the DMRE (Ref No: MP 30/5/1/2/2(304) EM);
- EA for the Greenside 3A North Dump approved on 30 March 2016 by the Department of Agriculture, Rural Development, Land and Environmental Affairs (Ref No: 17/2/3N-205); and
- Greenside Waterpan North EMPr approved on 4 December 2018 by the DMRE (Ref No: MP 30/5/1/2/2(304) EM).

Social and Labour Plan

A SLP was prepared as part of the Mining Right Application (**MRA**) in terms of the requirements of the MPRDA. Greenside has developed a SLP for the 2019 to 2023 period, which was submitted to the DMRE on 15 February 2019. DMRE approval was, however, not obtained at the time of submission, therefore an updated SLP for the 2019 to 2023 period was submitted on 30 September 2020.

In terms of section 28(2) of the MPRDA, "*the holder of a mining right or mining permit, or the manager of any processing plant operating separately from a mine, must submit to the Director-General— (c) an annual report detailing the extent of the holder's compliance with the provisions of section 2(d) and (f), the charter contemplated in section 100 and the SLP*". A SLP Annual Report was submitted to the DMRE on 25 February 2020.

Based on information presented in the Greenside SLP (AAC, 2020g), the site has a training centre that is ISO 9001: 2015 certified and has training provider status from the Mining Qualifications Authority (**MQA**). It submits an annual Workplace Skills Plan and an annual Training Report in accordance with the Sector Education and Training Authority's requirements. The annual Workplace Skills Plan and an annual Training Report were submitted on 12 April 2019. Greenside pay levies and claim grants in line with the provisions of the MQA (levy number L270214811). The Greenside SLP (AAC, 2019r) claims that Greenside complies, and will continue to comply, with the requirements of the Skills Development Act.

Table 3-7 provides a summary of all external and internal documents that guide the implementation of the Greenside SLP (AAC, 2019r).

Table 3-7: External and Internal Documents Relevant to the SLP

External	Internal
MPRDA and Regulations	Mine Workplace Skills Plan
DMRE Guidelines for SLPs	Mine Employment Equity Plan
Broad-based Socio-Economic Empowerment Charter for the South African Mining Industry (i.e. Mining Charter)	Mine Recruitment Plan
Skills Development Act No 97 of 1998	Employment Equity Policy
Employment Equity Act No 55 of 1998	Human Resource Development Policy
Labour Relations Act No of 1995	Retrenchment Policy
Basic Conditions of Employment Act of 1997	BEE Specification Policy
Broad-based Black Economic Empowerment Act No 53 of 2003	Preferential Procurement Principles Policy
Integrated Development Plan for Local Municipality	Learnership Procedure
Integrated Development Plan for District Municipality	Mentorship Procedure

Information presented in the Greenside SLP (AAC, 2020g), indicate that Greenside will support seven community Local Economic Development (**LED**) projects as presented in Table 3-8.

Table 3-8: SLP LED Projects

Project	Budget over Five Years (ZARm)
Purchasing of obstetrician ambulance for Department of Health	2.0
Community skills development and capacity building.	3.0
Community scholarship/bursary scheme	3.0
Purchasing of solar high mast streetlights for communities	1.0
Purchasing of pothole patching machine for eMalahleni Local Municipality	6.0
Purchasing of Sewer Machine for eMalahleni Local Municipality	9.0
Township Economic Regeneration (Infrastructure – Industrial Park)	3.5
Total	**27.5**

As per information in the Greenside SLP Annual Report for 2019 (AAC, 2019r), ZAR645 000 was spent on an ambulance for the Department of Health, with the remaining funds being re-directed to other needs within the department. In terms of the community skills development and capacity building, Greenside spent ZAR3.4 million to provide 120 individuals with training on various machines. This project had a ZAR400 000 overspend. The other LED projects have either been initiated but not yet implemented or will be implemented throughout the course of the next four years.

3.4.3. Legal Claims and Proceedings

[12.10(h)(iv)] [SR1.5(iv)] [SV1.2] [ESG4.3]

The Restitution of Land Rights Act, 1994 (Act No. 22 of 1994) provides for individuals or communities with claims to land ownership rights to apply for the restitution of, or compensation for, those rights. The process of redress is limited to the period after 19 June 1913 and the cut-off date for lodging such claims is 31 December 2018. This was addressed by the Draft Restitution of Land Rights Amendment Bill, published in Government Gazette No. 36477 of 23 May 2013 with the aim of amending the cut-off date for lodging such claims and regulating the administrative functions under the Land Rights Act. Submissions from the mining industry in this regard were made to the Minerals Council of South Africa, who submitted comments on the draft bill to the National Economic Development and Labour Council, who is addressing these and other comments with Government in a specially constituted task team.

AACSA has signed a Memorandum of Understanding (**MOU**) with the Department of Land Affairs and Rural Development, (now called the Department of Agriculture, Land Reform and Rural Development) agreeing that all AAC land claims, no matter to which property they apply, will be addressed in a separate forum and the claims on the properties will be researched and validated by an independent specialist.

Based on a review of the Lease Agreement Schedule Greenside (AAC, 2019ab), the lease agreements on several portions of land expired in July and August 2019 without any indication that the lease agreements have been extended. The lease agreement between ATC South Africa Wireless Infrastructure (Pty) Ltd for the remainder portion of Portion 2 of the farm Groenfontein 331 JS was originally signed in July 2017. It is unclear whether the lease has since been renewed. The lease agreement for the remainder portion of Portion 2 of the farm Groenfontein 331 JS, which belongs to Draaihoek Safaris Pty Ltd was extended to 31 July 2020 but has since lapsed. The land belonging to GJ Smith (i.e. Portions 2, 3 and the remainder of the farm Groenfontein 331 JS; Portion 2 and 22 of the farm Elandsfontein 309 JS; and Portions 2, 3, 7, 14, 23, 28 and 29 of the farm Blaauwkrans 323 JS) expired on 31 August 2019. The lease agreement with GS Truck and Crane Hire CC over Portion 3 and the remainder of the farm Groenfontein 331 JS also expired on 31 August 2019. The lease agreement with AJ Cronje over Portion 14 of the farm Nooitgedacht 37 IS expired on 31 July 2020. It was confirmed by the Mineral, Property Rights and Permitting Manager on 7 October 2020 that processes are in place to renew all of the abovementioned lapsed lease agreements.

The three land claims pertaining to the Greenside Area of Responsibility (**GAR**) that are under investigation and that have been registered with the Regional Land Claims Commission are shown in Table 3-9; these claims are in terms of Section 11(1) of the Restitution of the Land Rights Act No 22.

There is a total of 98 graves on four farms (i.e. Groenfontein 331 JS; Blaauwkrans 323 JS; Weltevreden 324 JS; and Vlaklaagte 330 JS) registered by Greenside (AAC, 2016). Greenside has logged the coordinates of each grave's location. Most of these sites fall within the internally agreed Greenside mining boundary (AAC, 2019w). Based on a review of Greenside's Social Risk Register (AAC, 2019aa), it is understood that Greenside has developed a Chance Find Procedure which controls the access of families visiting grave sites. The graves have been fenced off where there is family-controlled access.

Table 3-9: Registered Land Claims over Greenside Colliery

Number	Farm and Portion	Current Owner	Description of Land Claim
1	Weltevreden 324JS (Portions RE and 3)	Truter Boerdery Trust	Lodged by M.G. Mtsweni; Rule 5 en route for approval in March 2015. Government Gazette Notice No. 27047 on 10th December 2004; reference number 6573
2	Weltevreden 324 JS	Truter Boerdery Trust	B.J. Mahlangu already compensated by the MOU. Receive compensation equal Portion 2 of the land. Awaiting claimant verification and options.

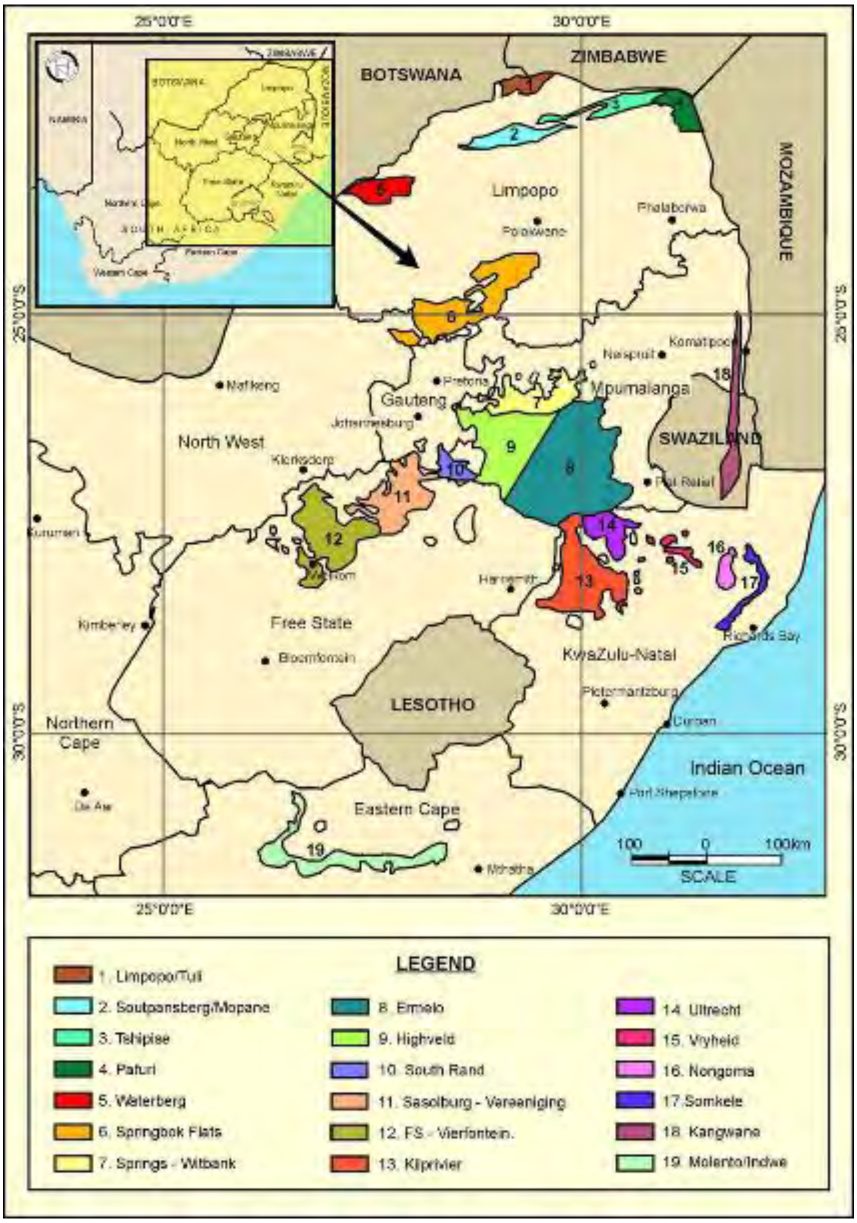
4. Geological Setting, Deposit and Mineralisation

[12.10(h)(v)] [SR2.1, SR3.1(vii)] [SV1.7]

4.1. Regional Geology

[SR2.1(i)]

Coal is found in South Africa in 19 coalfields, located mainly in KwaZulu-Natal, Mpumalanga, Limpopo, and the Free State, with lesser amounts in Gauteng, the North West Province and the Eastern Cape (Figure 4-1). All the coal deposits are found in the Karoo Supergroup, the majority in the Vryheid Formation of the Ecca Group, consisting predominantly of sedimentary rocks. Greenside is located in the Witbank Coalfield, within the Mpumalanga Province of South Africa (refer to Figure 1-2).

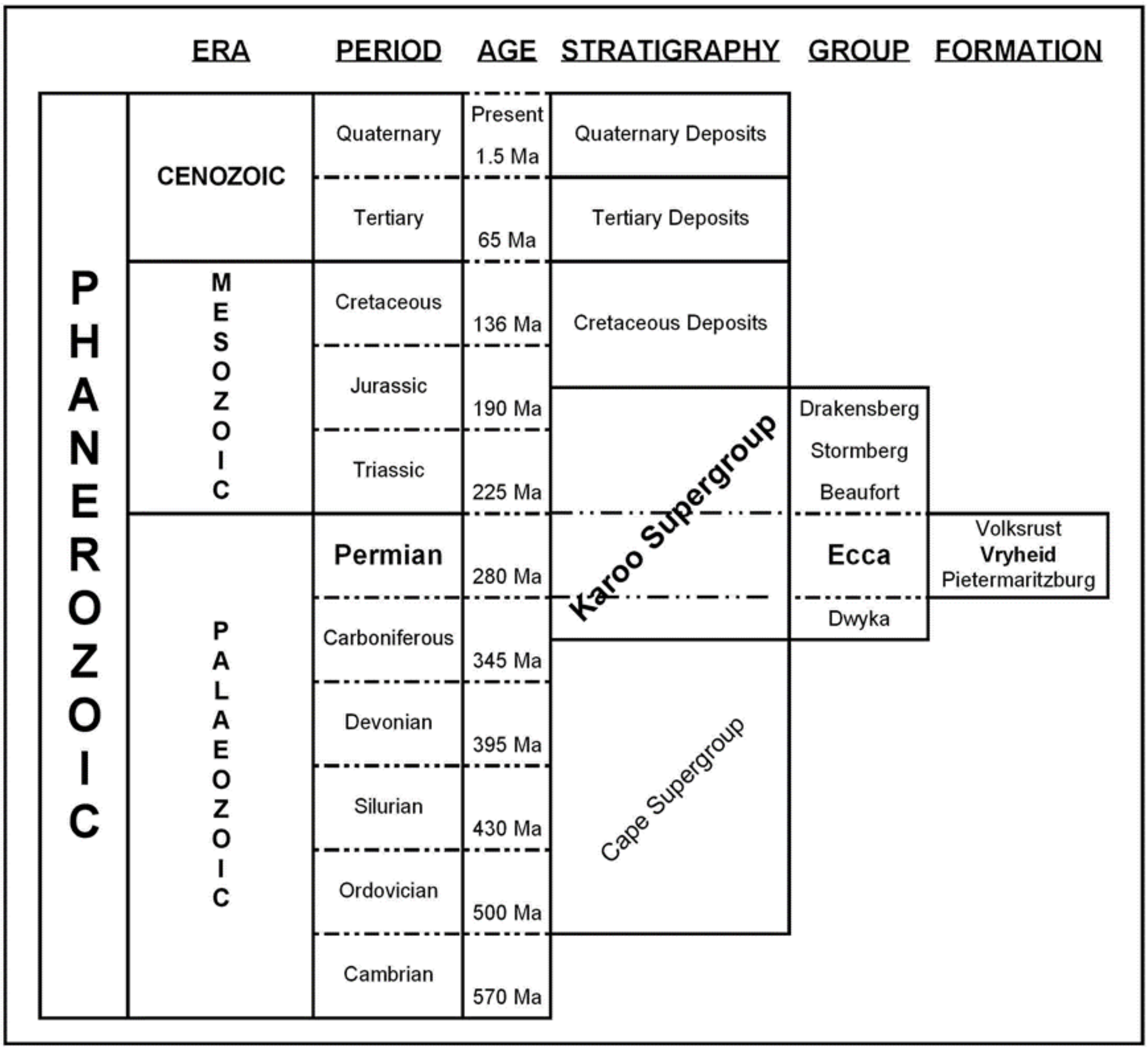


	GREENSIDE COLLIERY CPR Location and Distribution of Coalfields in South Africa	Project No. 566644

Figure 4-1: Location and Distribution of Coalfields in South Africa

The Witbank Coalfield extends for over 180 km in an west-east direction between Springs in the west to Belfast in the east and 50 km from north to south between Middelburg in the north and Rietspruit in the south, where it is separated from the Highveld Coalfield by the basement palaeohigh known as the Smithfield Ridge. The area is underlain by sedimentary rocks of the Karoo Supergroup, deposited 248 – 290 Ma during the Permian Period (Hancox & Götz, 2014). The thickness of the Karoo Supergroup varies from thin in the north to thickest the palaeovalleys and towards the south, with the variation in thickness primarily due to the uneven nature of the pre-Karoo topography. This uneven pre-Karoo topography is also responsible for the controlling the presence and thickness of the Dwyka Group sequence.

The Karoo Supergroup comprises, from oldest to youngest, the Dwyka, Ecca and Beaufort Groups, with the coal seams hosted within the Vryheid Formation of the Middle Ecca Group (270 Ma) as illustrated in Figure 4-2.



GREENSIDE COLLIERY CPR
Geological Timeline Indicating the Karoo Supergroup

Project No. 566644

Figure 4-2: Geological Timeline Indicating the Karoo Supergroup

4.2. Stratigraphy

The stratigraphy of the Witbank Coalfield is well described by Hancox & Götz (2014). The basal Dwyka Group sequence comprises massive diamictites with lesser matrix-supported conglomerates and coarse-grained sandstones. Occasional siltstone interbedded with sandstone, pebbly mudstones and varved siltstones are also present. The diamictites are composed of sub-angular to sub-rounded clasts primarily comprising granites, quartzites, mudstones and calcareous sandstones.

The Vryheid Formation (Figure 4-3) overlies the diamictites and other glacially derived sediments of the Dwyka Group. The Vryheid Formation sediments represent bituminous coal-capped upward fining cycles of clastic sediments, deposited in a fluviodeltaic/shallow marine environment. The formation is characterised by a variety of sandstones, mudstones and siltstones, with lesser amounts of coal and occasional gritstones. Five coal seams are present within the Vryheid Formation, the No 1, 2, 3, 4 and 5 Seam, named from the base up (Figure 4-3). The No 1 Seam is patchily developed across the coalfield, occurring the in lower parts of the palaeovalleys, and is rarely more than three metres thick (Jeffrey, 2005). In some areas of the Witbank Coalfield, the No 1 Seam is a source of high-grade steam coal suitable for export after beneficiation (Smith and Whittaker, 2005 and Snyman, 1998). According to Barker (1999), the No 1 Seam frequently has very low phosphorus content and in such cases, it is usually mined separately as metallurgical feedstock.

Due to its high coal quality, the No 2 Seam has historically been the most valuable seam to mine and export. In the latter part of the last century it formed the bulk of the high-grade steam coal exported to Japan. However, much of the seam has now been extracted and only remnants remain. The seam is generally in excess of four metres thick and frequently displays up to seven well-defined, vertical quality zones, related to the environment of deposition and peat accumulation. The three basal zones are the highest quality coal and were mined mainly for the production of low-ash metallurgical coal and export steam coal to Japan (Jeffrey, 2005). The upper part of the seam is generally shaley and frequently unmineable; selective mining takes place within the better-quality lower part of the seam.

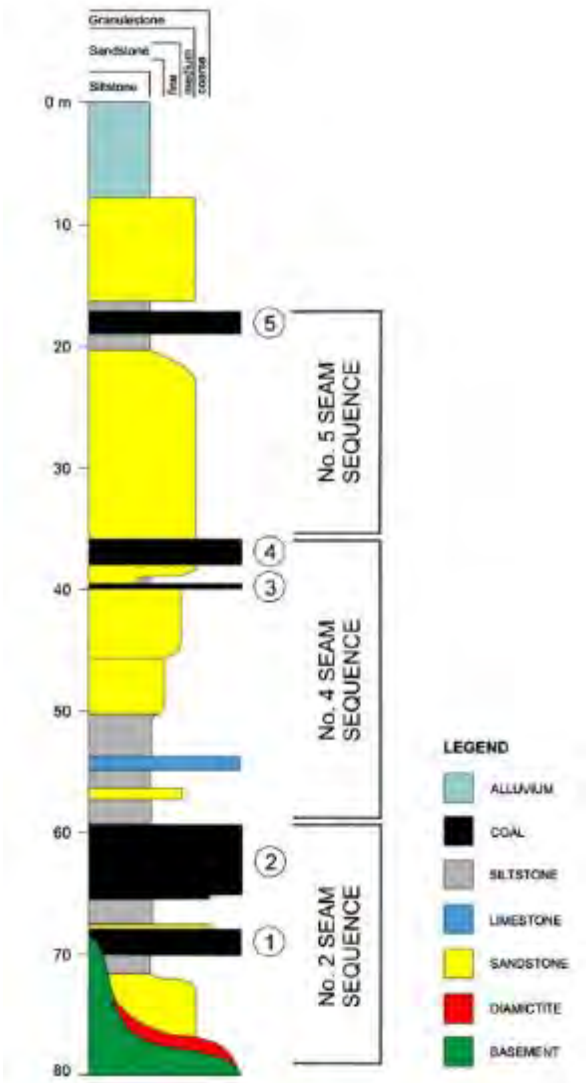
Although the Number 3 Seam (**No 3 Seam**) also consists of high-quality coal, it is usually thin (0.5 m) and is generally not mineable, except where it reaches thicknesses around one metre in surface operations. However, sulphur content in the No 3 Seam can be high and unfortunately is not reduced by beneficiation.

The No 4 Seam ranges in thickness between 2.5 to 6.5 m and is frequently split into an No 4 Seam Upper (S4U) and No 4 Seam Lower (S4L), with an additional upper (split S4A) also occurring in places. The partings between the seams consist of mudstone or siltstone and the coal is usually dull to dull-lustrous; the upper coal splits are generally lower quality than the lower splits. The coal is commonly used as feedstock for local Eskom power generation, but portions can be beneficiated to produce an export coal (Jeffrey, 2005). This seam is now the most commonly mined seam in the coalfield, due to the near exhaustion of the No 2 Seam.

The No 5 Seam occurs as an erosional remnant in higher lying areas of the coalfield and has been extensively mined in the central Witbank Coalfield as a source of blend coking coal (Smith and Whittaker, 2005). It is usually less than two metres thick but very little now remains due to previous mining.

Witbank coal seams dip gently to the south (1 - 3°), are flat to gently undulating and pinch out against the basin edge to the northwest. Localised steepening of the seams may occur close to basement highs. The seam floor topography is a direct result of the underlying palaeofloor and significant conformity in the floor topographies is observed from the base to the top of the coal bearing sequence.

During the mid-Jurassic break-up of the Gondwana continent, dolerite intruded the Karoo sediments (Hancox and Götz, 2014) in the form of sills and dykes. These occur throughout the stratigraphy, transgressing the seams in places and becoming more frequent south of the Ogies Dyke, a major west-east striking intrusion of up to 15 m in thickness and over 100 km in length. The sills vary from 15 to 50 m in thickness and may transgress the coal seams, causing tilting and displacement of the strata and resulting in discrete mining blocks at different elevations. Most dykes are usually less than a few metres thick and trend east, northeast or north. Some devolatilization of the coal is generally associated with these intrusions, varying in both severity and extent and having a negative impact on mining conditions. However, the metamorphic impact of the bifurcating 20 m thick so-called Witbank Sill has caused a localised increase in rank, with areas of high moisture content corresponding to devolatilized areas (Hancox and Götz, 2014). Faulting is usually not severe and is generally associated with dolerite intrusions.



srk consulting	**GREENSIDE COLLIERY CPR** General Stratigraphy of the Vryheid Formation in the Witbank Coalfield *(Hancox and Götz, 2014)*	Project No. 566644

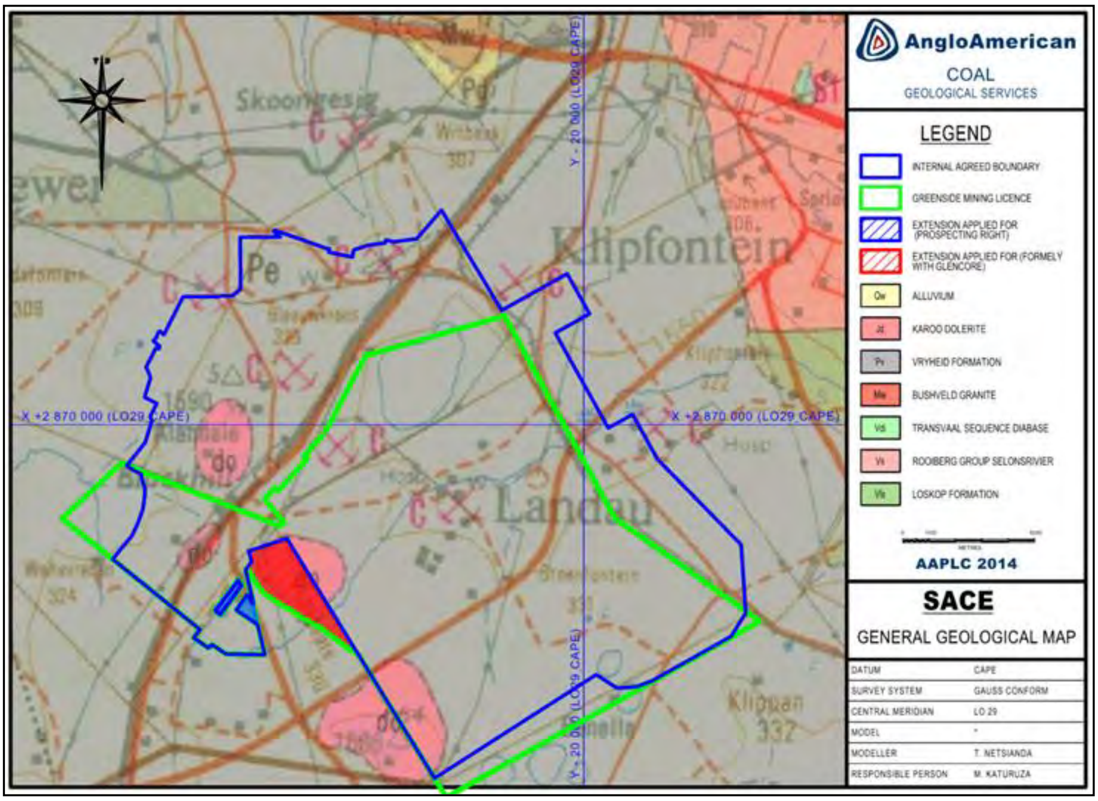
Figure 4-3: General Stratigraphy of the Vryheid Formation in the Witbank Coalfield

4.3. Local Geology

[SR2.1(ii)(iii)(iv)]

4.3.1. Surface Geology

Surface material at Greenside consists of weathering products of the sandstones, siltstones and mudstones of the Vryheid Formation, with isolated patches of dolerite in the southwestern part of the GAR. The top layer consists of reddish-brown sandy soil, with clayey-sandy subsoil below. The Greenside surface geology is illustrated in Figure 4-4.



srk consulting	**GREENSIDE COLLIERY CPR** Greenside Surface Geology *(Source: Greenside CPR, 2019 - AAC, 2019b)*	Project No. 566644

Figure 4-4: Greenside Surface Geology

4.3.2. Weathering

Weathering generally does not extend deeper than approximately 12 m at Greenside, except where adjacent to dolerite dykes and close to surface water bodies. In these instances, weathering may reach up to 17 m below the surface. Weathering negatively affects the mineable Coal Resource, but rarely has an impact of the physical mining operation in terms of mining method and design.

4.3.3. Sub-surface Geology

Strata at Greenside are typical of the Witbank Coalfield, with all five coal seams being present on the property. Underlying the coal sequence of the Vryheid Formation are glacial deposits of the Dwyka Group, which accumulated on the erosional pre-Karoo basement surface. Figure 4-5 illustrates the typical stratigraphy encountered at Greenside, as determined from drill hole intersections. The units are described from the base upwards in the following paragraphs.

Pre-Karoo Basement

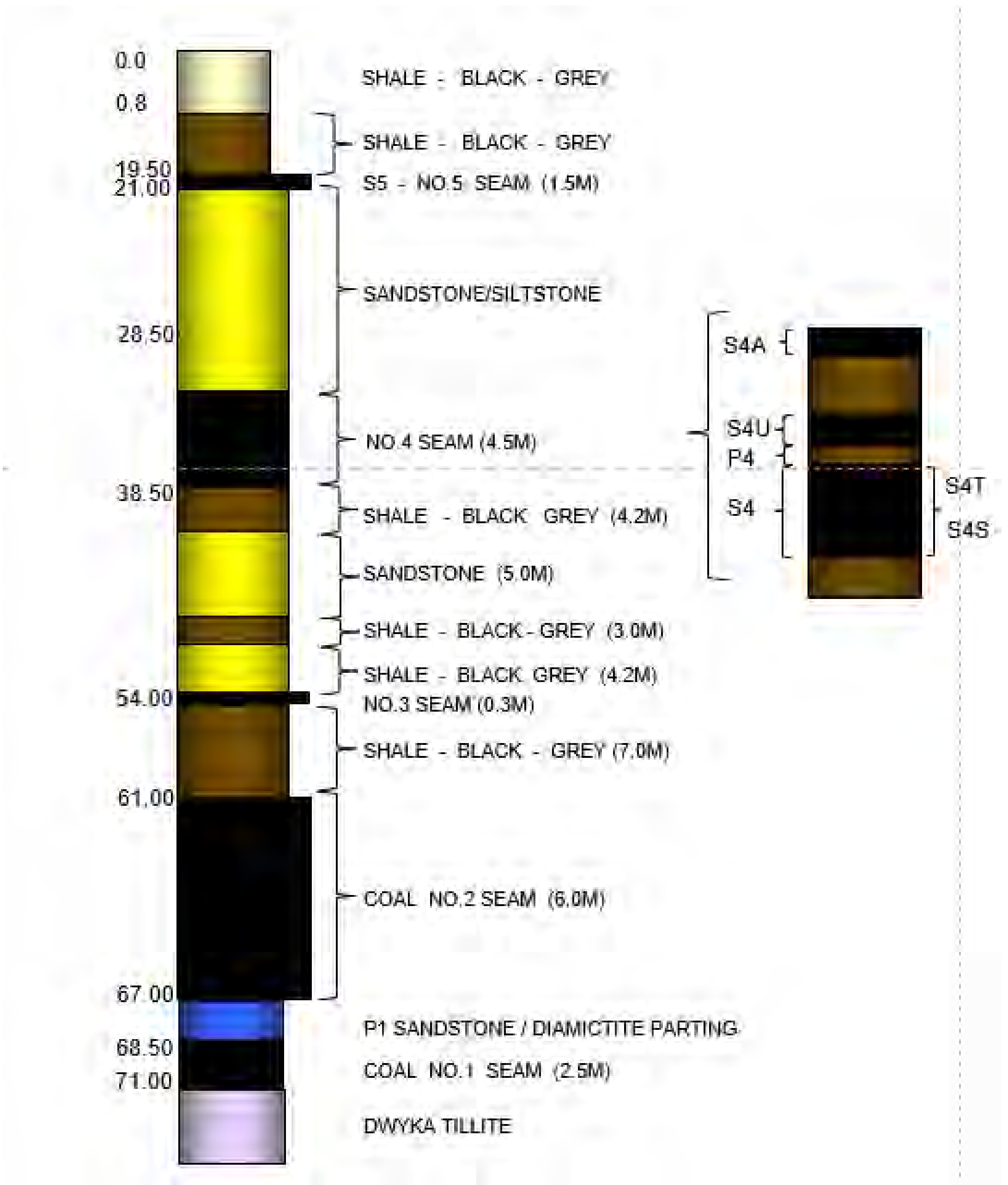
The palaeotopography of the pre-Karoo basement largely controlled the deposition of the lower coal seams and partings. Greenside is located within the Coronation palaeovalley (Smith and Whittaker, 2005) where the palaeotopography has a high relief and consists of dark reddish pink, aphanitic felsites of the Rooiberg Group of the Transvaal Supergroup, and dark green, coarsely crystalline diorites of the Bushveld Complex. The diorites are found in the southern portion of the GAR and are believed to have intruded the felsites.

Dwyka Group

The glacial deposits of the Dwyka Group vary within the project area and consist of fine-grained varved siltstone and shale to very coarse, matrix supported tillites. Clasts within the tillite are typically felsite from the Rooiberg Group, or sandstone and quartzite of the Wilge River Formation of the Waterberg Group. Varved sequences are common.

Ecca Group

Within the Ecca Group, the Vryheid Formation comprises zones of alternating conglomerates, sandstone and mudstones within which the coal seams are located. The stratigraphy of the Vryheid Formation may be divided into three main sequences, all of which are observed at Greenside: a basal No 2 Seam Sequence, overlain by the No 4 Seam Sequence, which in turn is overlain by the uppermost No 5 Seam Sequence .Figure 4-3 depicts the typical Greenside stratigraphy. Table 4-1 shows the various sub-seams and major partings that are found at Greenside. This is followed by descriptions of the main seams, their sub-seams and the clastic partings between them. Where possible, thickness estimates have been taken from the 2019 geological model; where a unit has not been modelled, the figures have been taken from the Company's 2019 Coal Resource CPR. Note that information is not available for every unit, especially those that are not of economic importance.



srk consulting	**GREENSIDE COLLIERY CPR** Typical Stratigraphy encountered at Greenside Colliery (AAC, 2019 *Greenside R&R Reconciliation Presentation*)	Project No. 566644

Figure 4-5: Typical Stratigraphy encountered at Greenside Colliery

No 2 Seam Sequence

Both the No 1 and the No 2 Seams occur in this sequence and are described from the base of the sequence upwards (Figure 4-3).

The Vryheid Formation of the Ecca Group conformably overlies the Dwyka Group, with the No 1 Seam found immediately above these glacial sediments. The seam conformably overlies the Dwyka Group and dropstones found within the seam demonstrate the close association of the seam with the Dwyka glaciation. In addition, the severe post-glacial topography is reflected in the topography of the seam floor, while the seam roof is uneven due to compaction features and associated dewatering (floating stone) structures. The seam consists of up 40% bright coal and ranges in thickness from almost zero (where it pinches out against basement palaeohighs) to up to 4.3 m, averaging 1.48 m. In places, a lower split of the No 1 Seam occurs (the No 1 Lower Seam), a dull, shaley coal, separated from the overlying main No 1 Seam by the P1L parting.

The No 1 Seam is separated from the overlying No 2 Seam by a clastic parting (the P1 parting) averaging 5.31 m thick, although it reaches a maximum of 29.14 m. The geometry of the parting is wedge-shaped, thinning eastwards. The parting is interpreted to be the sediments of a coarsening upward deltaic deposit in the north of the GAR, which changes southwards to more fluvial deposits consisting of interlaminated shales and sandstones with occasional coal stringers.

The P1 parting is conformably overlain by the No 2 Seam, which is subdivided into four zones based on coal quality from the base upward: Zones 1 – 3 make up the Select Horizon and consist of bright coal (60 – 90% bright) with an average thickness of 2.85 m (range: zero to 6.57 m), while the overlying poorer quality Zone 4 is termed the Non-select Horizon. Most of the No 2 Seam Select Horizon has been mined out with occasional top-coaling of the Non-select Horizon in places. Groups of stone rolls – described by Hancox and Götz (2014) as "*positive topographic features that protrude upwards into a coal seam and cause rapid seam thinning, dangerous floor conditions, production and grade control problems, and drainage problems*." - are common on the seam floor in some areas and are interpreted to be migrating bedload sandstone bar forms. These stone rolls are encountered in numerous places in the Witbank and Ermelo Coalfields, and are not restricted to Greenside.

Between the No 2 Seam and the No 3 Seam lies the P2 parting, comprising mainly black to grey shales. The parting averages 11.3 m thick and attains a maximum thickness of 38.3 m Approximately four metres above the top of the No 2 Seam a bioturbated siltstone is commonly found, acting as a useful marker horizon.

No 4 Seam Sequence

This sequence also contains two coal seams, the No 3 Seam followed by the overlying No 4 Seam (Figure 4-3).

Although present over most of the GAR, the No 3 Seam only averages 0.24 m thick, varying from zero to 1.47 m. Its narrow width currently makes it uneconomic to mine even though it consists of high quality bright coal. It is thus not a target seam at Greenside and is excluded from the resource estimates.

The parting between the No 3 and No 4 Seams (the P3) consists of thickly interbedded medium-grained sandstones and carbonaceous shale. This parting ranges in thickness from zero to 32.89 m, with an average thickness of 4.41 m. The immediate floor of the No 4 Seam (the top of the P3) is predominantly a fine to medium-grained sandstone that is sometimes bioturbated and often contains siltstone laminations. The seam floor topography is generally flat, with occasional stone rolls (similar to the No 2 Seam).

The No 4 Seam comprises the succession from the base of the No 4 Lower Seam to the top of the No 4A Seam. The sequence consists of three conformable main coal sub-seams: the basal No 4 Seam (main part of the seam), overlain by the No 4 Upper Seam and then the No 4A Seam; the sub-seams are separated by clastic partings consisting of varying amounts of interbedded carbonaceous shale, siltstone and sandstone (see inset detail in Figure 4-5). Due to their restricted thickness (on average, less than 1.5 m) and generally poorer coal quality dull coal, the No 4 Lower, No 4 Upper and the No 4A Seams are not regarded as economic targets and are excluded from the Coal Resource estimates. A more detailed description of the No 4 Seam sub-seams can be found below.

No 4 Lower Seam

The No 4 Lower Seam (S4L) is the lowest coal in the No 4 Seam Sequence; its distribution is sporadic, and the seam only averages 0.5 m in thickness. The coal is generally dull.

The No 4 Lower Seam may be separated from the overlying three units by the P4 Lower parting (P4L). The average thickness of this parting is 3.3 m, and as a result, the No 4 Lower Seam is not considered an underground mining target and is excluded from the resource.

No 4 Seam

The No 4 Seam (S4) is found across the entire GAR and is currently the only seam being mined. Laterally discontinuous in-seam shale and siltstone partings of up to 30 cm thick occur, negatively impacting the overall seam qualities. The seam is subdivided into four conformable units, from the base up:

- The lowermost No 4 Lower Seam (**S4L**);
- The No 4 Seam Select (**S4S**);
- The No 4 Seam Top Coal (**S4TC**); and
- The uppermost No 4 Seam Roof Coal (**S4RC**).

The four units together average around 14 m in thickness. These units may not all occur over the entire GAR; certain units may be restricted to specific parts of the GAR (described in more detail below). Zoning within the seam is not easily determined visually, although the top portion tends to be dull coal with poorer qualities than the lower portion of dull-lustrous to bright coal. The topmost two units (the No 4 Top Coal and No 4 Roof Coal) together are termed the No 4 Top Seam (**S4T**) and are usually combined into the single unit when it proves difficult to clearly identify the constituent units.

No 4 Select

As with the previously mined No 2 Select Seam, the No 4 Select Seam (**S4S**) is the best quality coal in the entire No 4 Seam. It consists of bright coal (60 – 90% bright) and ranges between 2.8 m to 4.5 m thick. The seam has been extensively mined out in the central portion of Greenside and now only exists in the northwest of the GAR.

No 4 Top

The S4T is found in the west of Greenside with an average thickness of 2.0 m, ranging between zero and 4.5 m; it is generally a dull coal with inferior qualities. The two component units are described below:

No 4 Top Coal

S4TC unit lies in the northwest of the GAR, contiguous with the No 4 Select Seam. The unit averages 1.5 m in thickness, ranging from 0.5 m to approximately 2.0 m and consists of dull coal.

No 4 Roof Coal

The S4RC has limited distribution. It is a dull to shaley coal and has the poorest coal quality in the No 4 Seam Sequence. The average thickness is 1.5 m.

The No 4 Seam Roof Coal is separated from the overlying No 4 Upper Seam by the conformable P4 parting, which ranges in thickness between zero and 3.5 m, with an average thickness of 3.7 m but attaining up to 30.5 m in isolated locations. The lithology of the parting consists of various combinations of carbonaceous shale, shale, siltstone and sandstone.

No 4 Upper Seam

The No 4 Upper Seam (**S4U**) occurs over most of the GAR and is also a dull coal; with an average thickness of 1.5 m, although it may reach thicknesses over 6.5 m in isolated places.

The No 4 Upper Seam is separated from the overlying No 4A Seam by the conformable P4U parting, consisting of alternating sandstones, siltstones and shales. It has an average thickness of 3.0 m; it does, however, attain thicknesses in excess of 30 m.

Table 4-1: Sub-seams and Partings

Sequence	Seam/Parting (Average thickness; thickness range (m))	Sub-seam (Average thickness; thickness range (m))	Unit/Zone	Model Count	Thickness (m)		Coal Type/Lithology
					Average	Range	
No 5 Seam	**S5**			**992**	1.7	0.2 – 4.9	Coal; 10 - 40% bright
	P4A			*NM*		*3.0 - 11.0*	*Laminated shale with occasional interbedded sandstone*
No 4 Seam	**S4A**			854	1.0	0.0 - 6.7	Dull coal
	P4U			*NM*	*3.0*	*0.0 - 30.0*	*Alternating sandstones, siltstones and shales*
	S4 (14)	**S4 Upper**		734	1.6	0.0 - 6.6	Dull coal
		P4		*836*	*1.6*	*0.0 – 15.3*	*Carbonaceous shale, siltstone, sandstone*
		S4 Top (1.7; 0.1 – 3.7)	**S4 Roof Coal**	39	1.4	0.5 – 2.7	Dull to shaley coal; <1% bright
			S4 Top Coal	22	1.7	1.0 – 4.1	Dull coal
		S4 Select		446	2.8	0.4 – 5.3	Bright coal; 60 - 90% bright
		P4L		*473*	*3.4*	*0.1 – 9.8*	
		S4 Lower		370	0.5	0.0 – 2.2	Dull coal
	P3			*NM*	*4.4*	*0.0 - 32.9*	*Sandstone, interlaminated with carbonaceous shale towards the top*
No 3 Seam	**S3**			NM	0.2	0.0 - 1.5	Bright coal
	P2			*NM*	*11.3*	*0.0 - 38.3*	*Sandstone, shale; bioturbated siltstone marker 4 m above No 2 Seam roof*
No 2 Seam	**S2 (5.0; 0.4 – 8.8)**	**S2 Roof Coal**		95	2.0	0.2 – 5.1	Dull lustrous coal
		S2 Top Coal		83	2.1	0.3 – 5.6-	Dull lustrous coal
		P2S					
		S2 Non-select	Zone 4				
		S2 Select (2.0; 0.3 – 3.8)	Zone 3 Zone 2 Zone 1	27	2.9	1.0 – 6.6	Bright coal; 60 - 90% bright
		S2 Floor Coal		34	1.4	0.1 – 2.6	Dull coal
		S2 Lower		NM		0.5 – 2.5	Coal; <10 % bright
	P1A						
No 1 Seam	**S1** (1.5; 0.0 - 4.3)	**S1A**					
		P1			*2.3*	*0.0 - 29.1*	*Sandstone (north); interlaminated shales and sandstones (south)*
		S1			2.0	1.5 - 4.3	Coal; 10 - 40% bright
		P1L			*< 1.0*		
		S1 Lower			< 0.8		Dull to shaley coal; <1% bright
		P1LL					
		S1 Lower-Lower					

Note:
1. NM = Not Modelled

No 4A Seam

The No 4A Seam (**S4A**) has a similar lateral distribution to that of the No 4 Seam. The seam varies in thickness between zero and 4.5 m with an average thickness of approximately 0.9 m; it consists of a dull coal. It is separated from the No 5 Seam by the P4A parting, a mainly laminated shale with occasional inter-bedded sandstone horizons. The parting thickness varies from three to eleven metres.

No 5 Seam Sequence

The lateral extent of the No 5 Seam (**S5**) is determined by the present day erosional topographic surface. The seam subcrops below the weathering profile in the southwest of the GAR on the farm Weltevreden 324 JS, as well as along the valleys associated with the channels of the Greensidespruit and the Naauwpoortspruit. The seam is found mainly in the central and northern portions of the GAR where it ranges in thickness between 0.5 and 1.6 m. It is thickest in the northwest where it achieves a maximum thickness of approximately six metres; the seam pinches out at the basin margins. Although consisting of better quality coal than the No 4 Seam (it is usually brighter coal than the No 4 Seam), its restricted distribution and overall thinness currently precludes its consideration as a mining target.

4.3.4. Pre-Karoo Topography

The topography of the pre-Karoo, interpolated from drill hole intersections, has significant relief in places. This has impacted on both the distribution and quality of the lower seams in some areas, particularly in the west of the GAR where a palaeohigh exists.

4.3.5. Faults and Slips

Greenside is transected by a major northwest-southeast striking fault (Figure 4-6) that has been observed across the entire lease area. This fault has been identified during mining of the No 2 Seam and its position projected upwards onto the No 4 Seam. Numerous other faults splay off the western end of this fault, from the centre to the north of the GAR, forming a "Y" shape. The fault plane dips 70° east and displacement has been both vertical and horizontal (right-lateral displacement). The maximum vertical displacement was measured in the No 2 Seam workings in the south (30 m); this decreases northwestwards to around one metre in the centre of the GAR.

A second laterally extensive fault, west of the major fault, strikes north-northwest from Vlaklaagte 991 JS in the south, through Weltevreden 324 JS and across Blaauwkrans 323 JS. The throw on this fault is not recorded. Numerous smaller faults occur, in the central, northern and western parts of the GAR, particularly around Clydesdale Pan.

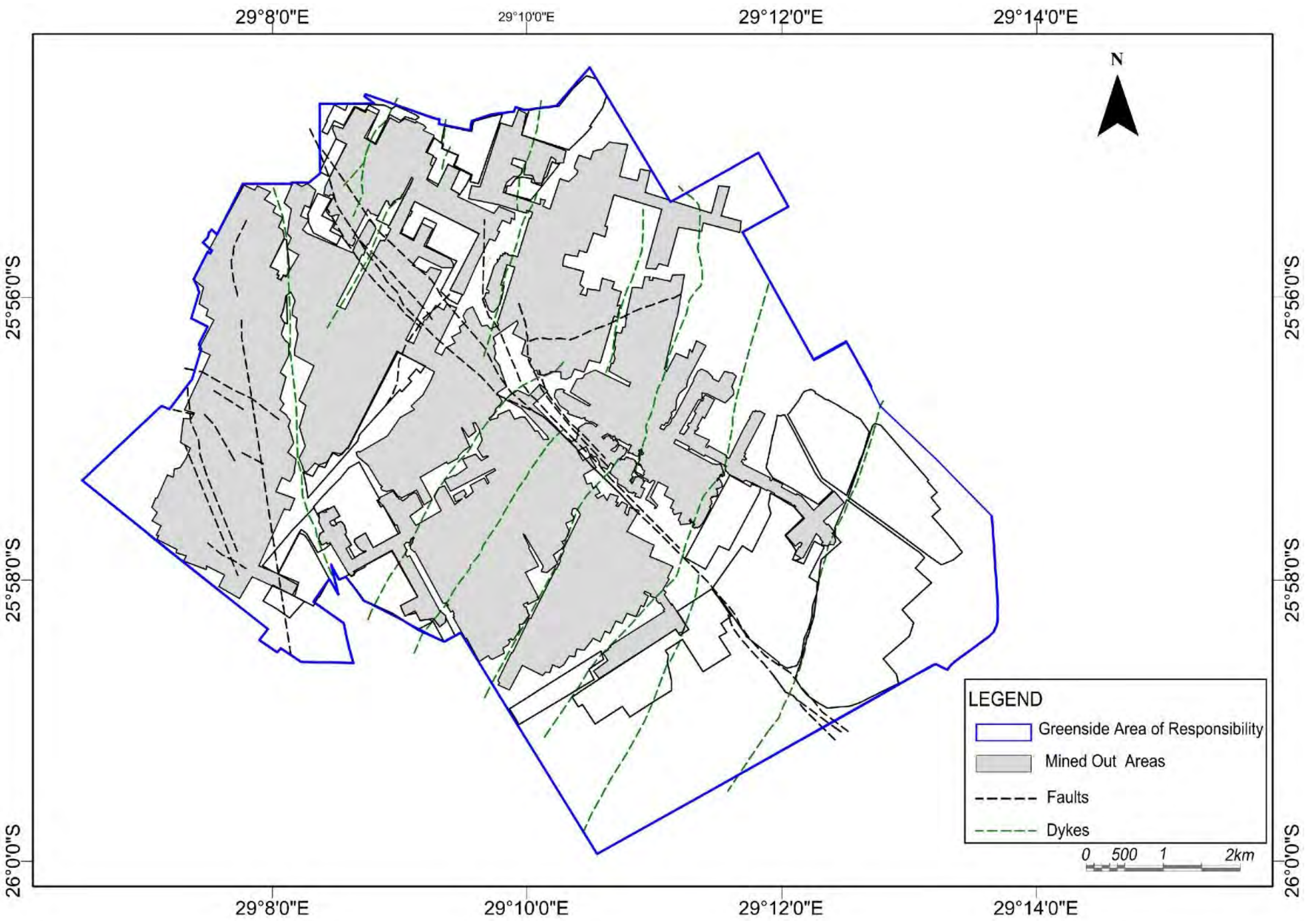
Mining has been constrained by the major fault, with development stopping on approaching the fault zone; the smaller faults have had minimal impact. Some slips have been recorded in the southwest and northwest; these tend to occur in groups.

4.3.6. Igneous Intrusions

Some dolerite dykes have been intersected at Greenside. These are approximately subparallel, strike northeast-southwest and are almost vertical (Figure 4-6). Certain dykes to the southwest of the fault appear to be truncated by the fault, while others extend to the northeastern side. Whether these represent two different intrusive episodes is unknown. Dykes have been intersected during mining in the Waterpan North and Navigation East areas, as well as in the eastern section of the GAR; these range in thickness between 0.5 and 3.5 m.

The fault along the western side of the GAR is also associated with a dolerite dyke; whether this is a fault that has been exploited during dolerite intrusion, or a dyke that has associated displacement is not known. Frequently the dykes are simply mined through, with little impact (recovery and contamination) on mining. However, examination of the mining layout indicates that the dykes have stopped development in places. This is due to poor ground conditions experienced during mining. The resource blocks in unmined areas where dykes are expected (for example, in the East Block, Figure 4-6) have been constructed to exclude the impact of these features, guided by the Mine Plan (Figure 6-13).

An aeromagnetic interpretation suggests the presence of two sill-like bodies in the west-northwest part of Greenside; however, these have not been confirmed by either exploration drilling or mining and appear to have no impact on the resource.



srk consulting	**GREENSIDE COLLIERY CPR** Structural Interpretation *(Source: Greenside CPR, 2019 - AAC, 2019b)*	Project No. 566644

Figure 4-6: Structural Interpretation

5. Exploration and Drilling, Sampling Techniques and Data

[12.10(e)(iii), 12.10(h)(vi)] [SR2.1(iii), SR3.1, SR3.2] [SV1.8]

5.1. Exploration

[SR2.1(iii), SR3.1] [SV1.8]

5.1.1. Historical Exploration

Historical exploration carried out by the previous owners (Table 5-1) has been incorporated into the current geological database and model. This data consists of drill hole and channel samples and their analytical results. In addition, holes were drilled by the Company at various times since 1949. Please note that not all these drill holes are used in the geological model.

There are no Quality Assurance/Quality Control (**QA/QC**) procedures on file for the non-Company drill holes. The data from these drill holes are assessed by how well they agree with the surrounding information, obtained from various drilling campaigns. In some instances, only model data exists, and no database records are available to check. Minor deviations from database sample depths to model depths may occur; these are assessed on an individual basis. The model utilizes samples with a 100% match between sample and lithology depth.

The Company has investigated the laboratory results to assess whether there were any significant differences between the results from the Company and non-Company analyses; but no significant differences were found.

Table 5-1: Historical and Current Drilling Programmes

Year	Responsible Mining/Drilling Company	Approximate Number of Drill Holes
Not recorded	Not recorded	2598
Not recorded	Witbank Colliery	75
1944 – 1990s	Rand Mines	12
1949 – 1990s	Drill Strata	3127
1971 – 1990s	GFSA	6
1971 - 1997	Terrasearch	2645
1949 - present	Anglo American	3458

5.1.2. Current Exploration

Current exploration drilling is governed by the relevant sections of Anglo American Coal Standard(s) and Requirements Document (**AACSRD**):

- Anglo American Coal OMS Operations Geology Standard AAC SD 23-25-107: Exploration (**AAC SD 23-25-107: Exploration**):
  - Manage Borehole Drill Data
  - Manage Exploration Plan
  - Manage Surface Drill Performance
  - Perform Surface Drilling and Preparation
  - Seal Surface Geological Boreholes & Rehabilitation

Exploration drilling should ideally be performed on a regular grid; however, various obstacles prevent this:

- The existing irregular drilling pattern;
- Surface water features (for example, the Clydesdale pan, perennial and non-perennial streams and

wetland areas);

- The Navigation, Clydesdale and current Greenside MRDs; and
- Existing infrastructure (for example, the RLT, the EWRP; power lines, road servitudes and agricultural activities).

Where possible, drilling is done when any of these areas become accessible (for example, as the MRDs are reprocessed, the surface becomes available for drilling). The impact of an irregular grid on the modelling is reduced as much as possible; residue impacts are catered for in the modelling algorithms.

5.1.3. Future Planned Exploration

[12.10(e)(iii)]

Future exploration is planned in three ways:

- Surface Diamond Drilling: this is aimed at ensuring the minimum drill hole spacing for classifying Measured Coal Resources as specified by SANS 10320:2020 and covers the entire GAR (refer to Section 6.5 for details). More closely spaced drilling is done in areas where structural complexities occur (for example, faulting, intrusions, seam thinning, areas of subcrop). This ensures the geological model better reflects the actual geological conditions. The holes are geologically and geotechnically logged and sampled; the samples are sent to the appropriate laboratories for analysis and the results incorporated into the modelling;
- Downhole Geophysical (wireline) Logging: the aim of the downhole geophysical logging (calliper, resistivity and density tools) is to assist with mapping unpredictable weathering profiles and correlating these data with that recorded by the geological logging; and
- Underground Diamond Drilling: horizontal in-seam drilling is done ahead of mining to provide timeous information on geological structures and possible methane and water strikes. In-seam drilling is done in both production and development sections.

A summary of the planned exploration expenditure for 2020 is given in Table 5-2.

Table 5-2: Greenside Exploration Drilling Budget for 2020

Region	Core Drill Holes	Total Length (m)	Cost Estimate (ZAR)	Samples Planned	Cost Estimate (ZAR)	Indirect Costs (ZAR)	Labour Costs (ZAR)	Total Cost Estimate (ZAR)
Waterpan North	12	960	864 000	108	486 000	205 130	612 006	2 167 136
3ANorth	23	800	720 000	207	931 500	205 130	612 006	2 468 636
Village	6	240	216 000	54	243 000	205 130	612 006	1 276 136
Total	**41**	**2000**	**1 800 000**	**369**	**1 660 500**	**615 390**	**1 836 018**	**5 911 907**

5.2. Surface Drilling Techniques

[SR3.2(i), SR5.3(i)]

Geological drilling is conducted by outside contractors under the conditions specified in the relevant AAC drilling contract.

5.2.1. Cored Drill Holes

Greenside has typically used conventional core drilling (diamond drilling) for most of the holes drilled. This produces a 63.5 mm diameter solid core for logging and sampling. Full core is usually produced once competent strata have been intersected. Open-hole drilling techniques are employed for the near-surface overburden material (usually by-products of current day weathering). The core is measured, any core loss is identified and recorded, and important geological units are marked off before logging commences. The core is logged by the field geologist responsible for Greenside exploration drilling in the field. Core logging data are recorded manually on Geological Coding Sheets ("logging sheets"), using a Company logical letter coding system ("Dictionary of Codes"). These data are then captured into the Geological Information Management System (**GIMS**) database where standard QA/QC routines ensure the correctness of the data; these routines are monitored by both the colliery and the AAC Exploration Department at eMalahleni.

As the strata are almost horizontal, the apparent seam thickness as measured in the vertical drill holes is virtually identical to the true seam thickness and no adjustment is required.

Drilling by different companies or during different drilling campaigns have targeted different seams, depending on the data requirements at the time. Thus, not every drill hole intersects the full stratigraphic sequence or the basement rocks below the coal measures. However, since 2007 Greenside has drilled exploration holes to ten metres below the last coal seam – usually the No 1 or No 1 Lower Seam.

5.2.2. Non-cored Drill Holes

Typically, the top six to twelve metres of each exploration hole is drilled using percussion or rotary methods ("open-hole"). This generally represents the weathering by-products in the soft overburden portion of the hole; depths vary depending on the intensity of weathering in the area. Holes are cased to the base of this soft material. Samples of this soft material are taken at one metre intervals and are logged according to texture, colour and lithology. The information is recorded on the logging sheets, for later capture in GIMS.

5.2.3. Other Boreholes

These holes include service holes drilled for rescue/refuge bays, dewatering boreholes and water monitoring boreholes. The holes are always open-holed to the required depth, cased to the base of the soft material and capped and locked where necessary. The rock chips are logged every metre, but the information is not included in the geological model.

5.2.4. Drill Hole Survey

[SR3.1(v)]

Surveying activities are governed by the AAC OMS Operations Geology Standard AAC SD 23-25-107: Exploration, specifically the section on Geology Survey Equipment Standard. Drill hole collar positions are either surveyed or determine using the Global Positioning System. The collars are checked against topographic data and the existing geological model to ensure accuracy.

5.2.5. Geological Logging Procedure

[SR3.2(iii)(iv)]

Two sections of AAC SD 23-25-107: Exploration control core logging and geophysical logging:

- Perform Core Logging Procedure; and
- Perform Down Hole Geophysical Survey.

Logging and coal sampling are done within one week of drilling to avoid deterioration of the core. The core is photographed, and the logging sheets completed. Note that photographic records do not exist for holes drilled prior to 2007. Table 5-3 lists the information recorded for each lithological unit. The responsible geologist checks all geological logs and sample results; in addition, the data are validated by the geological modeller before incorporated into the geological model.

Table 5-3: Recorded Drill Hole Data

Data Description	Data Description
Depth to top contact	Contact relationships
Depth to bottom contact	Grain size
Width (thickness) of interval	Degree of sorting
Main lithotype	Bedding features - spacing and dip
Seam name and sample number	Sedimentary structures - type and dip
Degree of weathering	Tectonic structures - type, spacing, description and dip
Colour - shade, hue and colour	Mechanical state
Lithological qualifiers (based on the Dictionary of Codes)	Fossils or minerals - abundance, type, and association

Geophysical Logging

Very little geophysical logging has been done as the strata are generally undisturbed and flat-lying; the high number of drill holes has assisted in the geological interpretation and the identification of the seams.

5.2.6. Core Recovery

[SR3.2(i)(v)]

The following section of AAC SD 23-25-107: Exploration applies to sample recovery:

- Monitor Core Recovery for Surface Vertical Drilling.

Core recovery is used as a guide to ensure that the data obtained from drilling are representative of the strata and coal seams. The core recovery is calculated by the logging geologist for each core run and reviewed against the driller's depth figures. Net losses are physically identified in the core, assisted by the geophysical log when required. Losses are usually revealed by circular grinding marks or crushed core, either as a result of the drilling process or due to the presence of faulting with associated weak material.

The Company requires a minimum core recovery in the coal seams to be at least 95%; if this is not achieved, the hole is redrilled, provided the coal is not weathered or burnt. The geologist's records of core recovery are stored in the Company's Hummingbird database while copies of the driller's daily reports are filed at the Anglo American Coal Geological Services (**ACGS**) offices in eMalahleni.

5.3. Coal Sampling and Analysis

Coal sampling and analysis is done to identify quality variations within the seams and to identify mining horizons. the Company has prescribed methods to sample and analyse the coal and to verify and store the results.

5.3.1. Sampling Governance

[SR3.5]

The AAC SD 23-25-107: Exploration sections listed below determine the coal sampling procedures followed:

- Manage Borehole Drill Data;
- Exploration Technical Pack; and
- Monitor Methane During Surface Drilling.

SRK has reviewed the AACSRDs pertaining to sampling and analysis and is satisfied that they represent good practice.

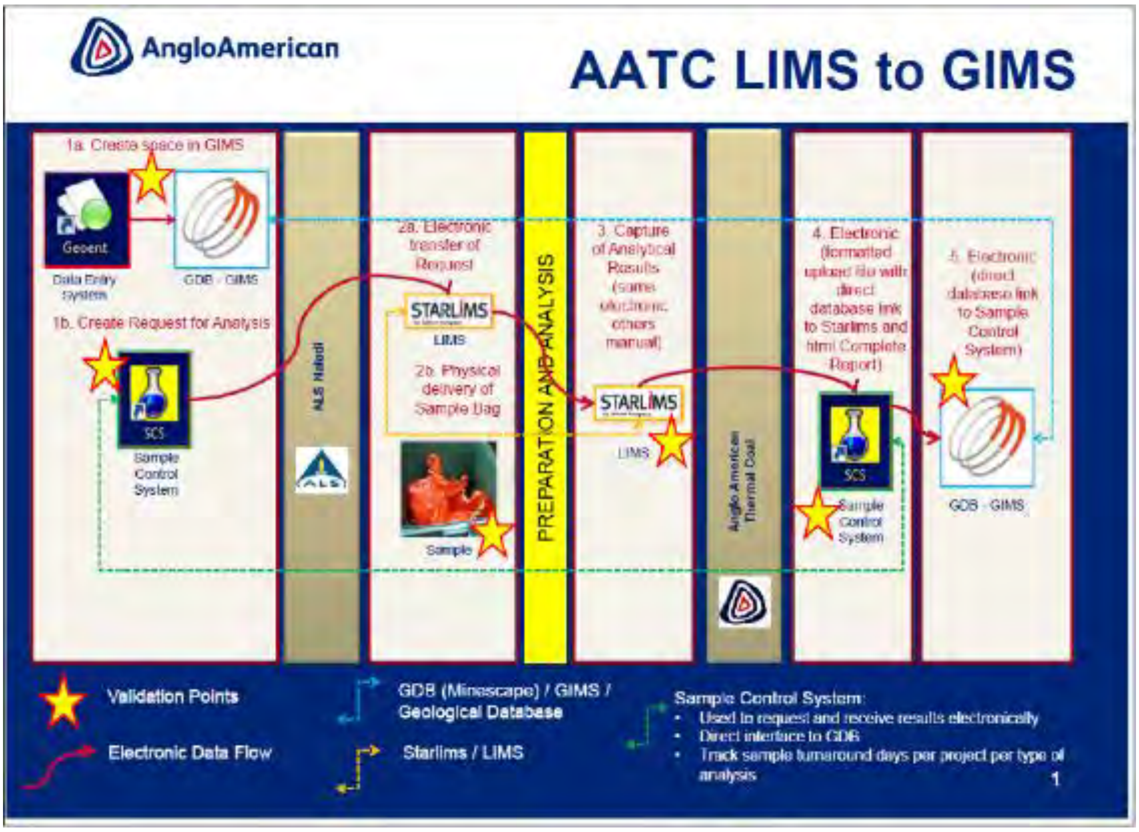
5.3.2. Sampling Method and Data Collection, Capture and Storage

[SR3.3]

The full core is used to ensure samples are representative. Contamination and coal losses are prevented by laying the core on plastic sheeting immediately after recovery from the hole. Sample intervals are selected, where possible, to match the seams in the geological model.

All samples are sealed in plastic bags and identified by the sample number, a unique alpha-numeric sequence written on manila tags placed inside and attached to the outside of the sample bag. Samples are labelled alphabetically from the base up. The sample number is recorded on the Log Sheet. The samples are sealed after bagging and delivered to the laboratory as soon as practically possible. The Company's sampling governance and chain of custody requires that each sample to be submitted to the laboratories is accompanied by a sample submission list that also serves as a sample advice sheet with instructions for analysis. The laboratory is notified of samples that are ready for delivery. Upon receipt of the samples, the laboratory representative cross-checks all samples against the submission list to confirm the names and number of samples they are receiving. All submission lists are managed in duplicates with signed copies scanned and saved electronically.

The laboratory uses an electronic Laboratory Information Management System (**LIMS**) to keep track of samples and analytical results. The analytical results are received electronically by the Company and uploaded into GIMS after verification routines have been applied to ensure the correctness of the results (Figure 5-1).



srk consulting	**GREENSIDE COLLIERY CPR** Information Flow for Sampling and Analytical Data *(Source: Greenside CPR, 2019 - AAC, 2019b)*	Project No. 566644

Figure 5-1: Information Flow for Sampling and Analytical Data

Once logging has been completed and the core photographed, the drill holes are sampled as per the methodology described above. For each sample, the unique sample identification, sample thickness and sample mass are recorded on the drill hole log sheet. In addition, the client name, project identification, as well as date is added to the sample ticket. Each sample mass is recorded using an electronic scale before being submitted to the coal laboratory. The sample mass is not included on the sample ticket to the laboratory, as the laboratory is required to weigh and report each sample mass before analysis as a sample control measure. The samples are submitted to the laboratory with the sample request sheet electronically lodged via the Sample Control System, using mask codes detailing the relevant analysis for execution.

5.3.3. Coal Sampling Preparation and Analysis

[SR3.4, SR5.3(i)]

Samples are weighed, air-dried (under controlled, prescribed atmospheric conditions) and conditioned before being crushed and screened to produce a -25 mm +0.5 mm sample fraction for analysis. Historically, the -0.5 mm fines were discarded; however, these are now being analysed. The mass percentage of the two size fractions are determined and reported. The samples are then analysed.

Sample analysis protocols, modified by site specific analytical procedure(s), are determined by AAC SD 23-25-107: Exploration sections:

- Manage Borehole Drill Data; and
- Exploration Technical Pack.

The Greenside-specific analytical regime applied to each sample is determined by a set of “Mask Codes”, developed in conjunction with the laboratory (Figure 5-2). The Mask Codes are based on the seam and coal type/parting material (Figure 5-3). Some samples are analysed raw, while others undergo full float and sink analysis; this applies to coal horizons that could potentially supply both the high and low-quality export markets. This allows the Company to perform all required export and domestic product simulations. Each float and sink fraction is analysed for proximate analysis (inherent moisture (**IM**) content, ash content (**ash)**, volatile matter (**VM**) content – expressed as percentages), calorific value (**CV[1]**) expressed in megajoules per kilogram (**MJ/kg**) and total sulphur (**TS**) content (also expressed as a percentage); fixed carbon (**FC**) content (as a percentage) is determined by difference. Ash, IM, VM and FC sum to 100%. Full washability tables with fractional and cumulative values for each density fraction are provided for each sample (where applicable). Samples that are analysed raw are described by a single line of data containing the proximate, CV[1] and TS.

Seam	Mask Code SC720	SC801	AN013	FR16AC	Comments
S5 Roof	0	1	0	0	1.5 – 2m of black shale to be sampled with appropriate geographical spread – not every hole.
S5	1	0	0	1	Only if > 1.5m thick. Review if thick (>0.5m) parting is developed.
S4A	1	0	0	1	Only if > 1.5m thick. Otherwise, use SC801. If < 1m thick use AN013
S4U	0	0	1	0	If S4U & S4P are combined and > 1m thick use SC801
S4P	0	0	1	0	If < 1m thick, include with S4U. If > 1m thick sample separately; use SC801 if coaly and carbonaceous or otherwise AN013
S4T	1	0	0	1	Usually the top 1.0 to 1.5m of the No. 4 Seam in the navigation West area of the mine is sampled.
S4	1	0	0	1	See sampling rules for seam splits.
S3	0	0	1	0	Only if thicker than 0.3m.
S2T	0	1	0	0	If > 1.5m thick use SC720 and FR16AC
S2S	1	0	0	1	Only if > 1.5m thick. Otherwise, use SC801.
S2L	0	1	0	0	If > 1.5m thick use SC720 and FR16AC
P1	0	1	0	0	If > 1m thick and coaly. Otherwise, use AN013.
S1	0	1	0	0	If > 1.5m thick use SC720 and FR16AC
P1L	0	1	0	0	If > 1m thick and coaly. Otherwise, use AN013.
S1L	0	1	0	0	If > 1.5m thick use SC720 and FR16AC
Note	1m of HQ core (diameter: 63.5mm & density of ~1.5t/m^3) weighs approximately 5kg.				
Notes	Maximum sample thickness should not exceed 5m. In the event that a core coal sample in excess of 5m thick is identified, the sample should be split at some recognisable intra-seam marker; if no such marker is available, at least two approximately equal samples should be defined. Minimum sample thickness for washed samples is 1m. Minimum sample thickness for Raw samples is 0.3m.				

srk consulting | **GREENSIDE COLLIERY CPR** Mask Codes and Sampling Rules *(Source: Greenside CPR, 2019 - AAC, 2019b)* | Project No. 566644

Figure 5-2: Mask Codes and Sampling Rules

Mask Code	Parameter / Elements	Density intervals
SC720	Proximate, CV, S, Phosphorous	1.40, 1.50, 1.60, 1.70, 1.80, 2.00
SC801	Proximate, CV, S	1.60, 1.70, 1.80, 2.00
AN013	Proximate, CV, S	Raw sample
FR16AC	Ash constituents	As for SC720
Notes	Proximate analysis parametres: Ash, Inherent Moisture (IM); Volatiles (Vols) and Fixed Carbon (FC). All determined on a percentage basis. FC determined by difference i.e. beenFC = 100 – (Ash % + IM % + Vols %)	
	CV: Calorific Value (MJ/kg); S: Sulphur	
	Ash constituents include: Al_2O_3; BaO; CaO; Fe_2O_3; K_2O; MgO; MnO; Na_2O; P_2O_5; SiO_2; SO_2 and TiO_2	

srk consulting | **GREENSIDE COLLIERY CPR** Coal Analyses *(Source: Greenside CPR, 2019 - AAC, 2019b)* | Project No. 566644

Figure 5-3: Coal Analyses

5.4. Quality Control/Quality Assurance

[SR3.5(i)(iii), SR3.6(i)]

5.4.1. Data Acquisition/Validation and Storage

Drill hole and analytical data is acquired, stored and validated according to AAC SD 23-25-107: Exploration sections:

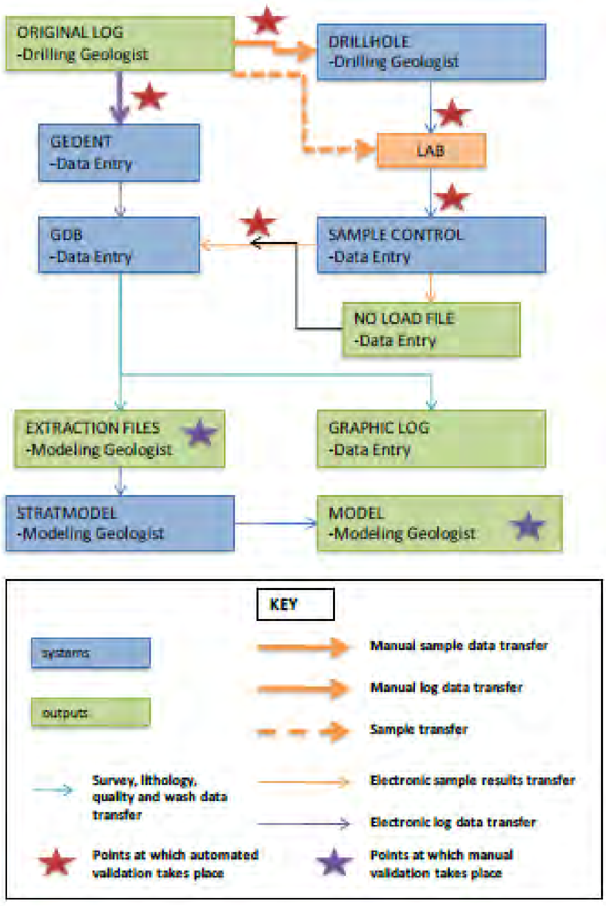
- Manage Borehole Drill Data;
- Manage Exploration Reporting;
- Manage Geological Domain;
- Geological Photography Standard; and
- Exploration Benchmarks - Mandatory Minimum Resource Knowledge Requirements.

All data are initially logged manually onto paper capture sheets. These sheets are then scanned to provide documentary evidence of the original logging. Copies of these scanned documents have been kept since 2009 and are stored at AAC's Exploration Department.

Drill hole collar survey data, core recovery information, geological logging and sampling data (including the type of analysis required and the analytical results) are then captured into an electronic database - GDB. GDB is a commercial geological database package, originally developed specifically for coal data and now supplied by Datamine. Data entry is via the GEOENT data entry system, an AAC-developed software package. GEOENT has automated checks to confirm correct seam intervals; however, the majority of data validation takes place within GDB.

During the early stages of data validation, automated checks are done by the software packages, while later data validation is done manually during geological modelling (Figure 5-4). If errors are identified during the automated validation, data entry/validation halts until the error is manually rectified. Standardised attribute ranges are pre-loaded into GDB; values outside this range generate an “out of range” warning and the values are excluded until such time as they are manually corrected, and the data reloaded. GDB also ensures that all quality data is related to a unique sample number and that this sample number is associated with a coordinated drill hole that contains coal seam information, If no such drill hole is found, the quality data is reported to the “no load” file and manual verification is required.

Figure 5-4 illustrates the data validation procedure, including points at which automated and manual data validation occurs.



srk consulting	**GREENSIDE COLLIERY CPR** Data Validation Flow Diagram *(Source: Greenside CPR, 2019 - AAC, 2019b)*	Project No. 566644

Figure 5-4: Data Validation Flow Diagram

5.4.2. Specific Data Validation for Coal Analyses

Coal samples were analysed by ALS Witlab and its predecessors until the 30 September 2018; thereafter samples were sent to Bureau Veritas (Pty) Ltd (**BV**) in Middelburg, Mpumalanga. BV is accredited by both the International Organization for Standardization (**ISO**) (ISO/IEC 17025:2017) and the South African National Accreditation System (**SANAS**). The accreditation is valid until 25 July 2021. ALS Witlab (no longer in operation) was also SANAS accredited. Figure 5-5 shows the BV accreditation certificates while Table 5-4 lists the standards used by BV during the preparation and analysis of the samples.

Table 5-4: Standards Employed by BV during the Company's Coal Sample Analysis

Property Measured	Standard Employed
Preparation of Test Sample	ISO 18283 Part 8
Ash Content (%)	ISO 1171
Volatile Matter Content (%)	ISO 562
Inherent Moisture Content (%)	SANS 5925
Total Moisture Content (single stage)	ISO 589
Gross Calorific Value (MJ/kg)	ISO 1928
Total Sulphur (%)	ASTM D4239
Calculation of Fixed Carbon Content (%)	ISO 17246

BV ensures accuracy, precision, repeatability and reproducibility of its results by:

- Analysis of Certified Reference Materials and control samples;
- Participation in the quarterly COALSPEC Proficiency Testing Scheme since 1998. The Scheme is conducted and administered by Coal & Mineral Technologies (Pty) Ltd, a subsidiary of the SABS and involves the participation of more than 50 national and international laboratories; and
- Outsourcing samples to external ISO accredited laboratories to verify analytical results. The following laboratories are used:
  - Anglo American Research Laboratories;
  - Coal and Mineral Technology (Pty) Ltd, a subsidiary of SABS; and
  - Inspectorate BV, UIS/ACT.

5.5. Relative Density

[SR3.1(i), SR3.3(iii), SR3.5(iii), SR3.7(i)(iv)]

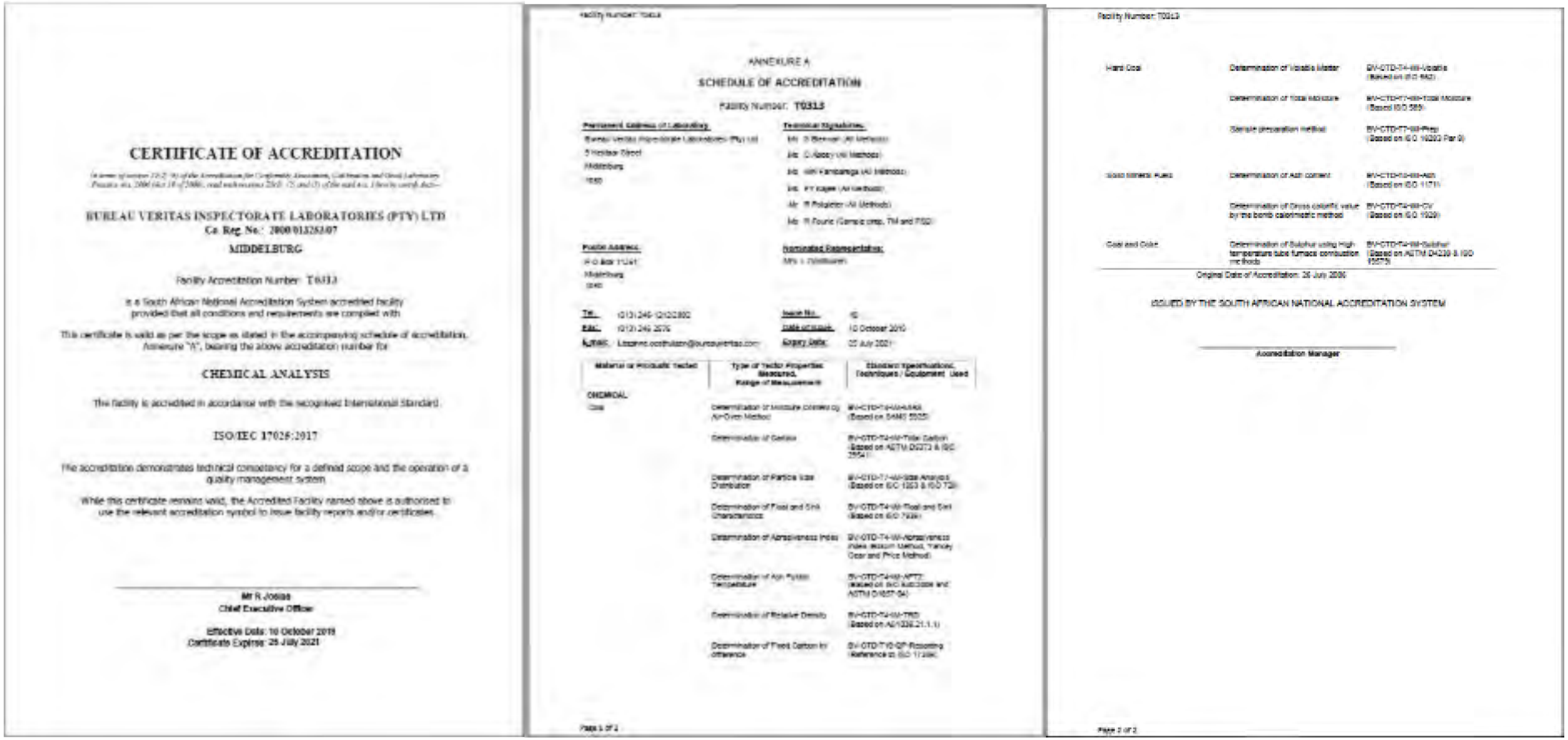
The raw relative density (**RD**) is not determined by the laboratory but calculated using a standardised formula based on the air-dried ash value. The formula was derived from regression analysis conducted in the 1980s on the proximate and apparent relative density analysis of multiple deposits and seams within the Witbank Coalfield. In 2018, MinRes, a department of Anglo American Plc, reviewed analysed data from 174 bulk core samples as well as data from seven other coal companies; data from five sub-basins of the Witbank Coalfield were included in the review. The conclusions are:

- There is sufficient evidence to support the use of the generic regression formula for relative density from ash in both fresh and devolatilised samples; and
- The relationship describes an Apparent Density that is expected to approximate the *in situ* density, on an air-dried basis.

The formula used is:

$$\text{Relative Density}_{adb} = 0.0126 \text{ x Raw Ash\%}_{adb} + 1.26$$

Where
adb = air-dried basis



CERTIFICATE OF ACCREDITATION

BUREAU VERITAS INSPECTORATE LABORATORIES (PTY) LTD
Co. Reg. No.: 2000/013282/07
MIDDELBURG

Facility Accreditation Number: T0313

is a South African National Accreditation System accredited facility provided that all conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation, Annexure "A", bearing the above accreditation number for

CHEMICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2017

The accreditation demonstrates technical competency for a defined scope and the operation of a quality management system

While this certificate remains valid, the Accredited Facility named above is authorised to use the relevant accreditation symbol to issue facility reports and/or certificates

Mr R Josias
Chief Executive Officer

Effective Date: 10 October 2019
Certificate Expires: 25 July 2021

Facility Number: T0313

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: T0313

Permanent Address of Laboratory:
Bureau Veritas Inspectorate Laboratories (Pty) Ltd
5 Hexriver Street
Middelburg
1050

Postal Address:
P O Box 11261
Middelburg
1050

Tel: (013) 246-1212/2800
Fax: (013) 246 2076
E-mail: Lizanne.oosthuizen@bureauveritas.com

Issue No.: 10
Date of Issue: 10 October 2019
Expiry Date: 25 July 2021

Material or Products Tested	Type of Tests/ Properties Measured, Range of Measurement	Standard Specifications, Techniques / Equipment Used
CHEMICAL		
Coal	Determination of Moisture Content by Air-Oven Method	BV-CTD-T4-WI-AMA (Based on SANS 5925)
	Determination of Carbon	BV-CTD-T4-WI-Total Carbon (Based on ASTM D5373 & ISO 29541)
	Determination of Particle Size Distribution	BV-CTD-T7-WI-Size Analysis (Based on ISO 1953 & ISO 728)
	Determination of Float and Sink Characteristics	BV-CTD-T4-WI-Float and Sink (Based on ISO 7936)
	Determination of Abrasiveness Index	BV-CTD-T4-WI-Abrasiveness Index (Based Method, Yancey Geer and Price Method)
	Determination of Ash Fusion Temperature	BV-CTD-T4-WI-AFTZ (Based on ISO 540:2008 and ASTM D1857-04)
	Determination of Relative Density	BV-CTD-T4-WI-TRD (Based on AS1038.21.1.1)
	Determination of Fixed Carbon by difference	BV-CTD-T10-QP-Reporting (Reference to ISO 17246)

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Facility Number: T0313

Hard Coal	Determination of Volatile Matter	BV-CTD-T4-WI-Volatile (Based on ISO 562)
	Determination of Total Moisture	BV-CTD-T7-WI-Total Moisture (Based ISO 589)
	Sample preparation method	BV-CTD-T7-WI-Prep (Based on ISO 18283 Par 9)
Solid Mineral Fuels	Determination of Ash content	BV-CTD-T4-WI-Ash (Based on ISO 1171)
	Determination of Gross calorific value by the bomb calorimetric method	BV-CTD-T4-WI-CV (Based on ISO 1928)
Coal and Coke	Determination of Sulphur using High temperature tube furnace combustion methods	BV-CTD-T4-WI-Sulphur (Based on ASTM D4239 & ISO 19579)

Original Date of Accreditation: 26 July 2006

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Accreditation Manager

Page 2 of 2

srk consulting

GREENSIDE COLLIERY CPR
Bureau Veritas SANAS Accreditation Certificate

Project No.
566644

Figure 5-5: Bureau Veritas SANAS Accreditation Certificate

5.6. Drill Hole Data and Geological Model Validation

[SR2.1(iv)] [SR3.2(ii)] [SR3.3]

The validation is undertaken to ensure that data are correctly transferred from the original logs to GDB, the electronic geological database, and then into the modelling software database. The final step is to check the model values against those in the model database, ensuring integrity between all steps of the data collection and modelling process. This is to enhance the reliability of the geological interpretation and the resource estimation process, by ensuring the validity of the data.

5.6.1. Drill Hole Data Validation

SRK has reviewed a random selection of 100 original drill hole logs, sampling records and analytical results and compared them with the corresponding data contained in GDB, the electronic geological database, as well as the resultant values in the geological model. The drill holes were selected from areas ahead of the mining faces and/or in areas of complex geology or mining. The results of this comparison exercise are shown in Appendix 1and described below.

- **Drill Hole Collar Co-ordinate Verification:** The collar co-ordinates contained in the original logs were compared with those contained in the GDB database and the geological model.

  Thirty one of the 100 drill holes audited had no original logs, while two drill holes showed discrepancies between the original log, the GDB log and the data held in the model. It appears that the drill holes have been moved in the model, but no reason could be found to clarify this;

- **Drill Hole Collar Elevation Verification**:

  Two drill holes were found to have discrepancies of greater than two metres in the collar elevation values of the original and GDB logs and the model values; however, neither of these drill holes were flagged during the collar elevation versus digital terrain model (**DTM**) verification;

- **Seam and Sample Validation:** This check is used to identify incorrectly ordered seam intervals, negative interval thicknesses, interval overlaps and any other seam inconsistencies.

  Various discrepancies occur between the original logs and the GDB logs and the GDB logs and the model; the reader is referred to Appendix 1 for details. Some examples of discrepancies are:

  - Re-correlation of the No 4 Seam sub-seams between the original logs and GDB/Stratmodel has been done in some drill holes, usually where the original log has labelled the S4U, S4T and S4S and any partings simply as the S4. However, the resultant split into the separate sub-seams is not always consistent as the S4T is sometimes included in the model and sometimes not (*cf.* SACG241 and SACG261). The decision governing when to split the S4T from the S4S does not appear to be lithological and may be done on qualities or erratically. This is the most common reason for sub-seam depth discrepancies and should be reviewed; and
  - One probable typographical with the base of sample D in drill hole SAC3023.

- **Raw Data Validation:** The raw data quality data was verified by checking that the ‘from’ and ‘to’ depths of the individual sample plies corresponded to the composited sampled ‘from’ and ‘to’ depths.

  The proximate values (Ash %, VM %, IM %, and FC %) were checked to ensure that they summed to 100 % (99.8 % – 100.02 %).

  The raw densities were recalculated using the equation 0.012 x ash + 1.26 in order to determine if there were any inconsistencies in the densities calculated by the Company.

  The quality data appear to have been correctly transferred to the modelling software.

  SRK is satisfied that the original data have been adequately transferred to the electronic database and that the processes and techniques used to validate the geological data prior to constructing the geological model are appropriate and have been correctly applied.

5.6.2. Geological Model Validation

- **Drill Hole Collar Co-ordinate and Elevation Validation:** During modelling, the model database values are compared with the DTM and any discrepancies are investigated. If these discrepancies are not able to be resolved, the drill hole is omitted from the model database.
- **Seam Validation:** This check is used to verify for incorrectly ordered seam intervals, negative interval thicknesses, interval overlaps and any other seam inconsistencies. The No 4 Seam is currently logged and modelled as three plies; however, originally it was modelled as one seam. In order to model and understand the variation within the seam better, the historical drill holes were re-evaluated to identify the individual plies. Verification of the drill hole database has indicated that this process was carried out well, with no anomalies identified.
- **Raw Quality Data Validation:** The raw data quality data was verified by checking that the 'From' and 'To' depths of the individual sample plies corresponded to the composited sampled 'from' and 'to' depths. Where discrepancies were noted, they were small and would not have a material effect on the model. Nonetheless any discrepancies flagged should be investigated and corrected or removed, whichever is most suitable.

  The proximates (Ash %, VM %, IM %, and FC %) were checked to ensure that they summed to 100% (99.8% – 100.02%) which they did.

  The raw densities were recalculated using the equation 0.012 x ash + 1.26 in order to determine if there were any inconsistencies in the densities calculated by the Company (refer to Section 5.5). Regarding the coal samples, no anomalous densities were identified; however, regarding the standard parting code values with high ash contents (sandstone and mudstone), the densities varied slightly more when compared to the calculated values. The effect this would have on the overall composited sample qualities is negligible. It is understood that this method of determining the relative densities of the coal samples has been used on all of the Company's collieries for many years. It is, however, suggested that on a per colliery basis, a portion of the samples are sent for density testing, the results of which can be used to confirm the formula used.

6. Coal Resources

[12.10(h)(ix)]

6.1. Target Seam

The No 4 Seam is considered the target seam at Greenside.

Although the No 2 Seam has previously been mined and some coal still remains in the Central Block, access to the seam is complex and has not been planned. The remaining No 5 Seam coal is classified by the Company as Low Potential (this is a category that is not recognised by either SAMREC or SANS10320:2020). Please refer to Section 8.3 for further information. The No 2 and No 5 Seams have thus been excluded from these resource estimates.

6.2. Geological Modelling

[SR2.1(iii), SR4.1(i)(ii), SR4.2(iv), SR5.2(iii)]

The Greenside model under review was created by Ms U. Herrmann, a Resource Geologist Specialist at the Company, using Datamine's StratModel™ Software version 6.1.1 and reviewed by SRK using StratModel™ version 7. The model was completed on 25 March 2019.

The Greenside model is part of the larger SACE model, an established model which is well understood and managed. The supporting Company Standards and Procedure Documents ensure that there is a high level of confidence with regard to the geological modelling procedure. The model has undergone both internal and external audits, which adds an additional level of confidence to the model.

A total of 7 860 drill holes are used in the SACE Complex model, which encompasses both Greenside and Khwezela Collieries. The model includes No 5 Seam, No 4 Seam, No 2 Seam and No 1 Seam. The No 2 Seam and No 1 Seam have been mined extensively in the past and the No 4 Seam is now the main economic target, although limited amounts of No 2 Seam are found in the south in the Vlaklaagte area.

Numerous north-northeast striking dykes are encountered (Figure 4-6), which have been modelled as vertical faults; displacement across these dykes is minimal. The extensive northwest-southeast orientated fault dips 70° east, although it has been modelled as vertical. The impact on the Coal Resource estimates is minimal as mining has stood off from areas of significant displacement (towards the southeast) or resource polygons have taken this into account.

6.3. Geological Model Review

[SR2.1(vii),SR4.1(iii)(iv)(v), SR4.2(v), SR7.1

Resource Blocks

For ease of reference, the GAR has been subdivided into three main areas for the discussions in this section of the report (Figure 6-1): West Block (remaining mining west of the rail line in the current mining area), Central Block (Vlaklaagte area in the south-central portion of the GAR) and East Block (future mining area in the southeast).

The Greenside model was evaluated by Ms K. Black of KJB Geoservices under the guidance of Ms L. Jeffrey. The following items were assessed:

- How the physical and quality drill hole data were loaded and evaluated;
- That the modelled data accurately reflected the original drill hole data;
- The interpolation parameters used to create the model;
- The interpretation of the data to ensure that the final structural model is a true reflection of the coal in the ground; and
- That the Coal Resource estimation methodologies were correct and appropriate. SRK has used selection expressions during the resource estimation to ensure that the cut-off parameters have been correctly applied and that the resource estimates are appropriate.

Model and data validations included the following:

- Topographic surface generation and evaluation – evaluating whether surveyed collar coordinates fall within two metres of the topographic surface and understanding any discrepancies.

  Sixteen drill hole collars were found to be more than two metres different from the model topographic surface, five in West Block and 11 in East Block; there are no such discrepancies in the Central Block (Table 6-1 and Figure 6-2). All the drill holes in the West Block have collar elevations higher than the elevation of the model topographic surface;
- Evaluating any differences between the drill hole data and the model interpretation;
- Structural interpretation of dolerite intrusions, faulting, seam pinch out and subcrop, etc.;
- Quality checks and evaluation - checking that the data load tables contain no sampling gaps, that all standardised coal quality values for unsampled material have been included where necessary; the sample compositing rationale (the correct method is to only composite data for which there are no missing samples or depth overlaps) and examining quality plots for “bull’s eyes” which require corroboration;
- The correct application of Coal Resource cut-off limits; for example, the volatile matter content limit, minimum seam thickness, subcrop lines and mined out areas; and
- The polygon classification was in accordance with the SANS10320:2020 guidelines.

The Greenside model is an established model that is well understood and managed. The supporting Company Standards and Procedure Documents ensure that there is a high level of confidence with regard to the geological modelling procedures. The model has undergone both internal and external audits, which add an additional level of confidence to the model.

The SRK interrogation of the Greenside model and the checks on the data have revealed no noteworthy discrepancies. The modelling parameters and resultant geological and quality model are considered a true and accurate reflection of the Coal Resources at Greenside. SRK is therefore satisfied that the model is fit to use to estimate the Coal Resources for Greenside as at 31 December 2020.

Table 6-1: Drill Holes with Collar Elevation Differences compared with Topography

Block	Drill Hole	Elevation Difference (m)
West	SAC1012	-2.316
	SAC1038	-3.898
	SAC1094	-3.203
	SAC1097	-2.940
	SACG194	-3.896
East	SACGF010	2.225
	SACGF042	3.086
	SACGF056	2.153
	SACGF170	3.570
	SACGF245	-2.187
	SAC1029	-2.516
	SAC3195	-2.340
	SACMM83A	2.428
	SACMM94A	3.137
	SACG1505	2.960
	SACG1506	-3.623

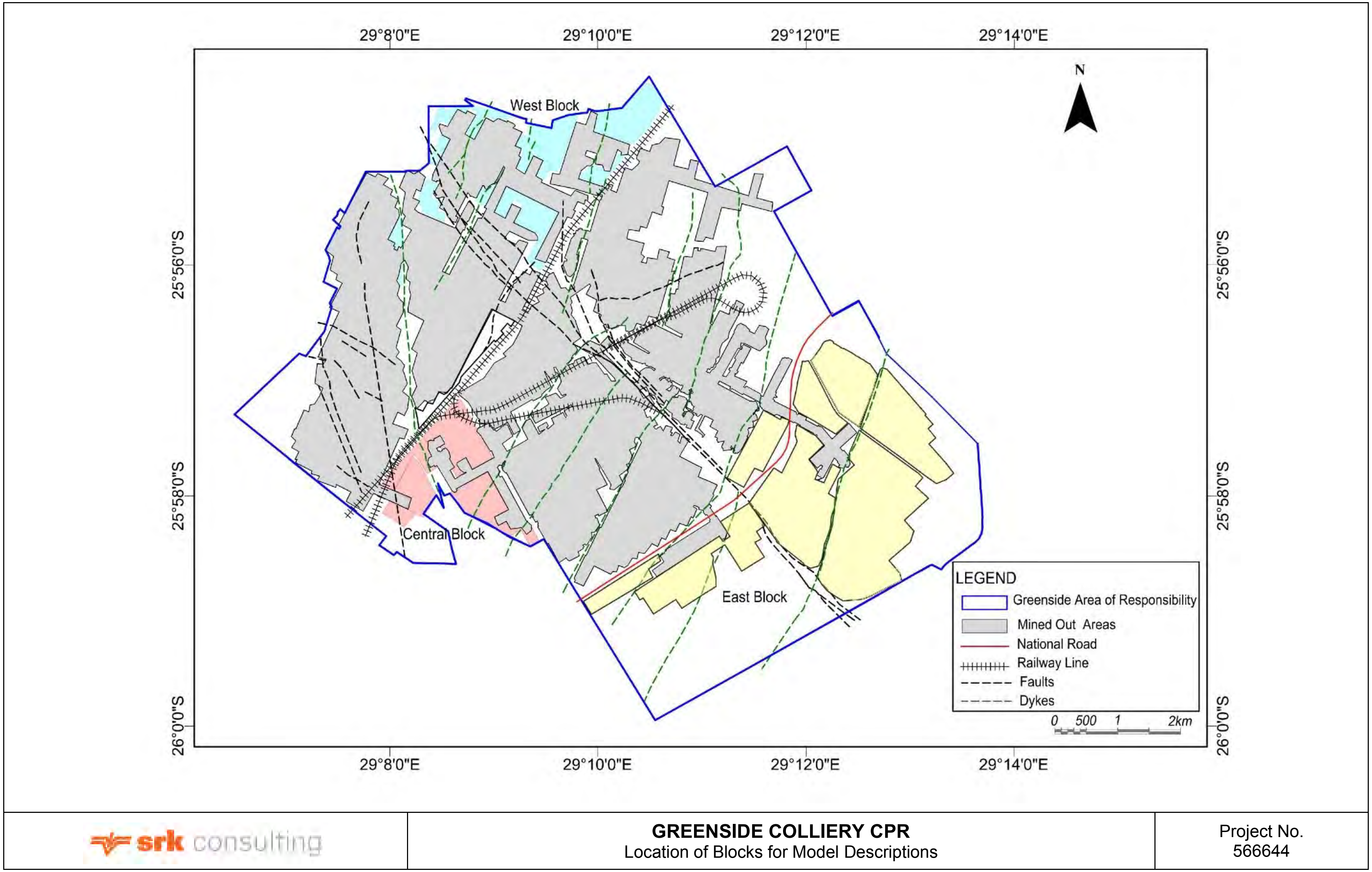


Figure 6-1: Location of Blocks for Model Descriptions

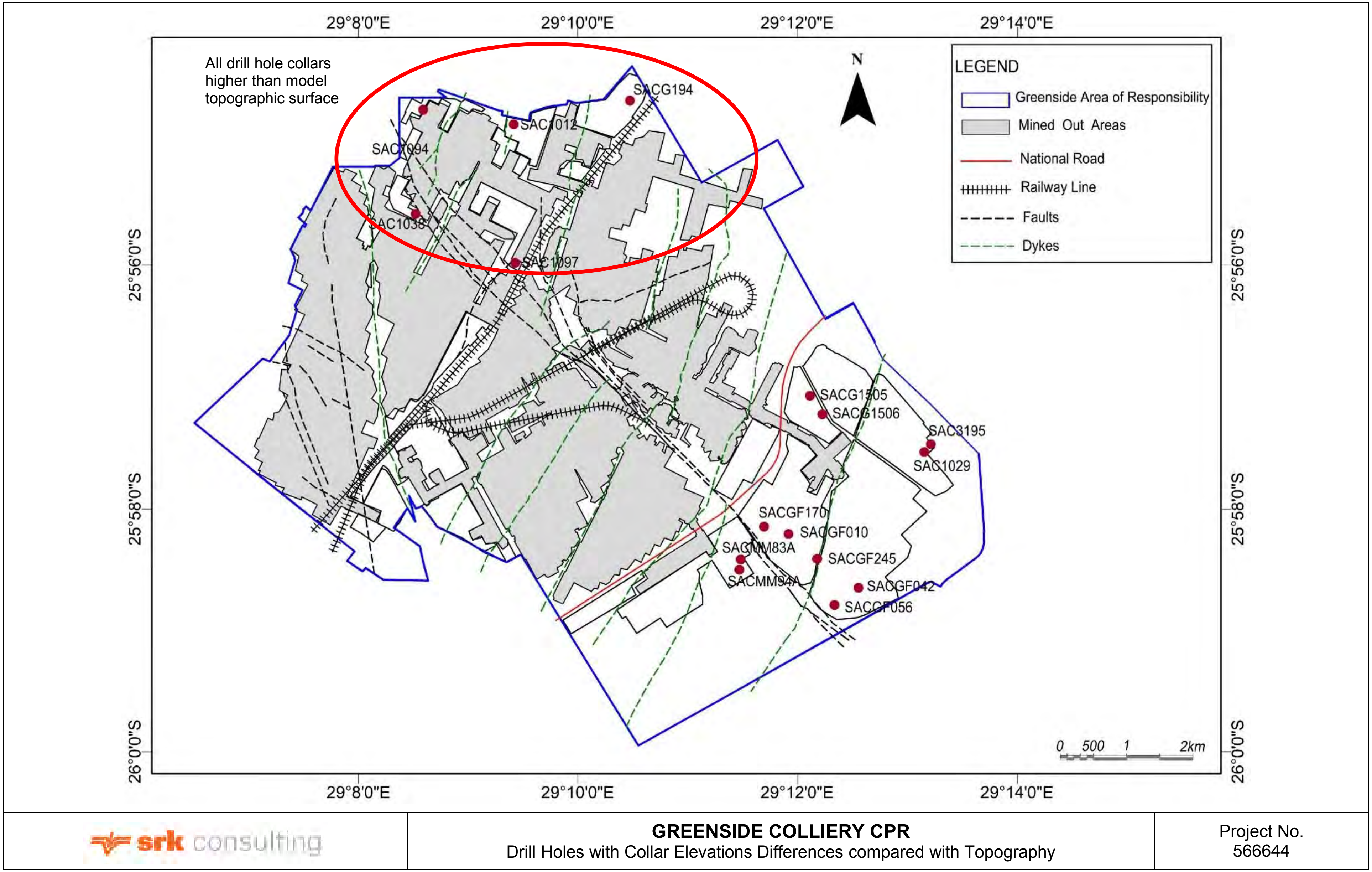


Figure 6-2: Drill Holes with Collar Elevation Differences compared with Topography

6.3.1. Physical Results

[SR2.1(v)(vi), SR3.1(vii), SR4.1(i)]

The physical parameters modelled included seam floor elevation and the depth from surface of the seam floors and roofs as well as the limit of weathering. The seam thicknesses were also modelled, and these were used as the basis for the estimation of the Coal Resource volumes. Although all these parameters were modelled, only the seam thickness, floor elevation and depth from surface results for the target seam (No 4 Seam) are presented (Figure 6-3 to Figure 6-5), along with a brief description of the results. In addition, classical statistics for the modelled seam are compared with similar statistics derived from the drill hole data (Table 6-2 and Table 6-3). The purpose for this comparison is to determine whether the modelling algorithm used has changed the nature of the deposit (or whether the model is a true reflection of the data for example, modelled the seams at greater depths than the data suggest in areas of sparse data or resulted in excessive thickening of thinning of the seam that is not supported by the underlying geological data).

The No 4 Seam is present throughout the entire GAR and is thickest in the Central Block and thinnest in the East Block (Figure 6-3). The average modelled seam thickness compares well with the average drill hole seam thickness in all three areas, with a maximum difference of less than 5% in the West and Central Blocks and less than 1% in the East Block. The thickness range in the model is similar to that of the drill hole data, although with slightly lower values; the difference is not significant. The drill hole data is more variable compared with the modelled data, as can be seen from the standard deviations but the skewness (a measure of the symmetry of the data distribution around the mean) is different in size but not sign between the model and the drill hole data. The skewness indicates that in the West Block most thickness values are lower than the mean thickness, while in the Central and East Blocks, most seam thicknesses are greater than the mean (compare the skewness values in Table 6-2 and Table 6-3).

Cross sections through the model indicate the gently undulating nature of the seam. (Figure 6-6 and Figure 6-7). The displacement across the fault is evident in cross section B-B’ and E-E’; there appears to be little, if any, displacement across the major dykes. The seam is at its lowest elevation in Central Block, a known low point in the Witbank Coalfield (clearly shown in Figure 6-4), and at similar mean elevations in the West and East Blocks (around 1 515 mamsl), although more variable in East Block. A comparison of the floor elevation statistics reveals that the model is slightly more variable than the drill hole data, although this is insignificant. The skewness of the modelled and drill hole data is similar, with no change in character. Floor elevation differences are impacted by the regional dip of the seam and disturbance by faults and igneous intrusions. Thus, the actual value of the skewness is not important, provided the character of the skewness does not change.

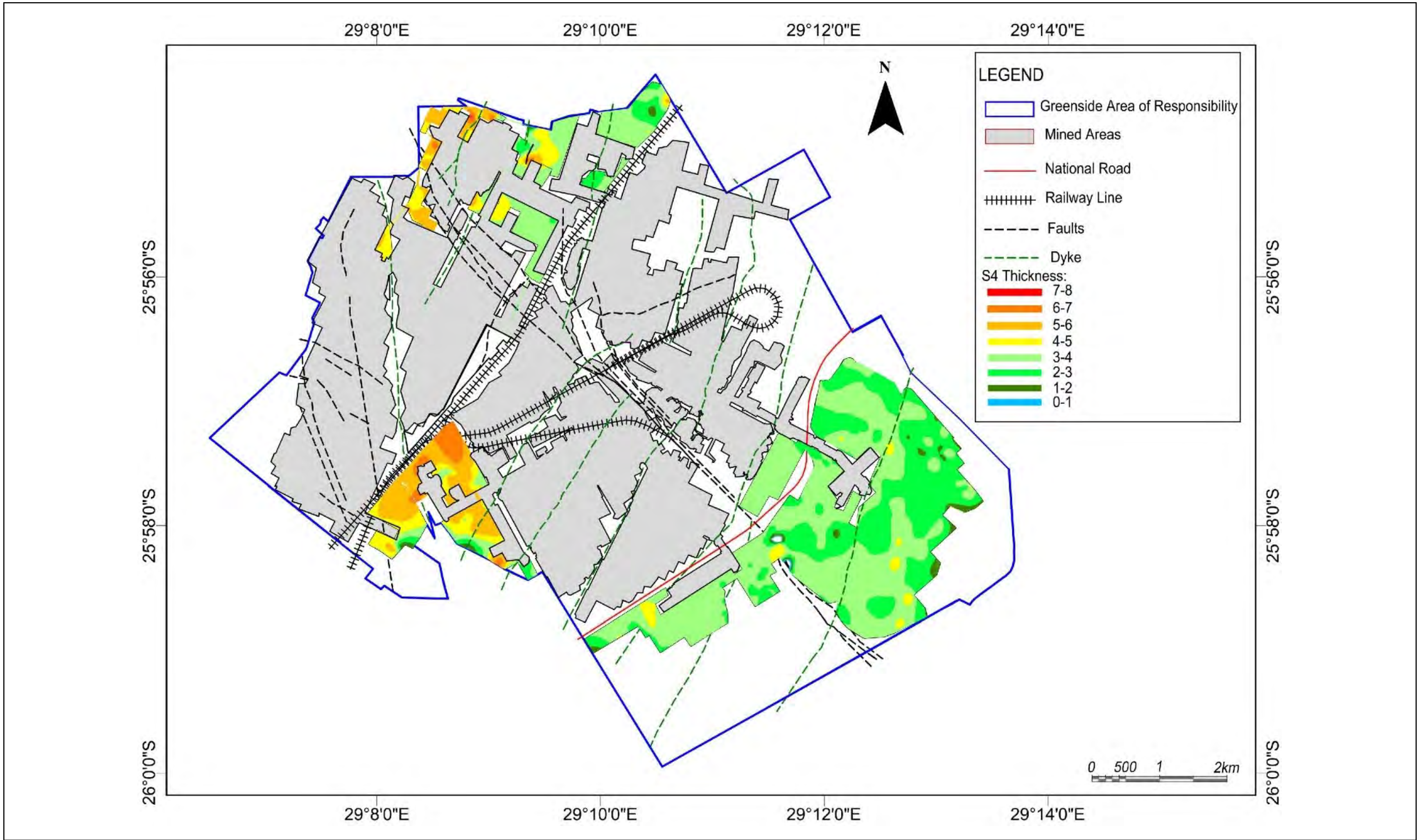
The depth below surface (Figure 6-5) is affected by the present-day topographic surface, an effect of erosion. The variability in the seam depth is a factor of the topographic surface combined with the regional dip and structural disturbance of the seam. It is an important consideration only in areas of potential surface extraction, whether of virgin coal or removal of existing pillars. Significant portions of the West and East Blocks indicate the No 4 Seam is less than 40 m below surface; the Company has special guidelines for extracting seams that are close to surface (refer to Section 7).

Table 6-2: No 4 Seam Model Statistics

Block	Number	Mean	Minimum	Maximum	Standard Deviation	Skewness
No 4 Seam Thickness (m)						
West	4009	3.89	1.41	7.50	0.95	0.77
Central	2791	4.94	1.09	6.54	1.04	-1.01
East	14678	3.07	0.10	4.98	0.45	-0.42
No 4 Seam Floor Elevation (mamsl)						
West	4009	1515.66	1489.05	1534.63	10.31	-0.99
Central	2791	1495.42	1479.56	1512.76	7.56	-0.03
East	14678	1511.63	1480.15	1549.34	11.08	1.18
Depth to No 4 Seam Roof (m)						
West	-	43.58	16.42	85.35	-	-
Central	-	78.95	57.11	94.65	-	-
East	-	52.12	17.09	104.59	-	-

Table 6-3: No 4 Seam Drill Hole Statistics

Block	Number	Mean	Minimum	Maximum	Standard Deviation	Skewness
No 4 Seam Thickness (m)						
West	25	3.73	1.53	7.62	1.43	1.43
Central	16	4.72	2.45	6.57	1.36	-0.12
East	178	3.10	1.23	4.64	0.55	-0.39
No 4 Seam Floor Elevation (mamsl)						
West	45	1516.86	1489.75	1530.99	9.64	-0.95
Central	31	1494.86	1481.27	1508.35	7.67	-0.02
East	269	1516.01	1489.96	1550.11	13.93	0.92
Depth to No 4 Seam Roof (m)						
West	-	41.14	20.22	84.86	-	-
Central	-	80.00	57.72	93.96	-	-
East	-	46.14	20.06	96.57	-	-



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No 4 Seam Thickness (m)

Project No.
566644

Figure 6-3: No 4 Seam Thickness (m)

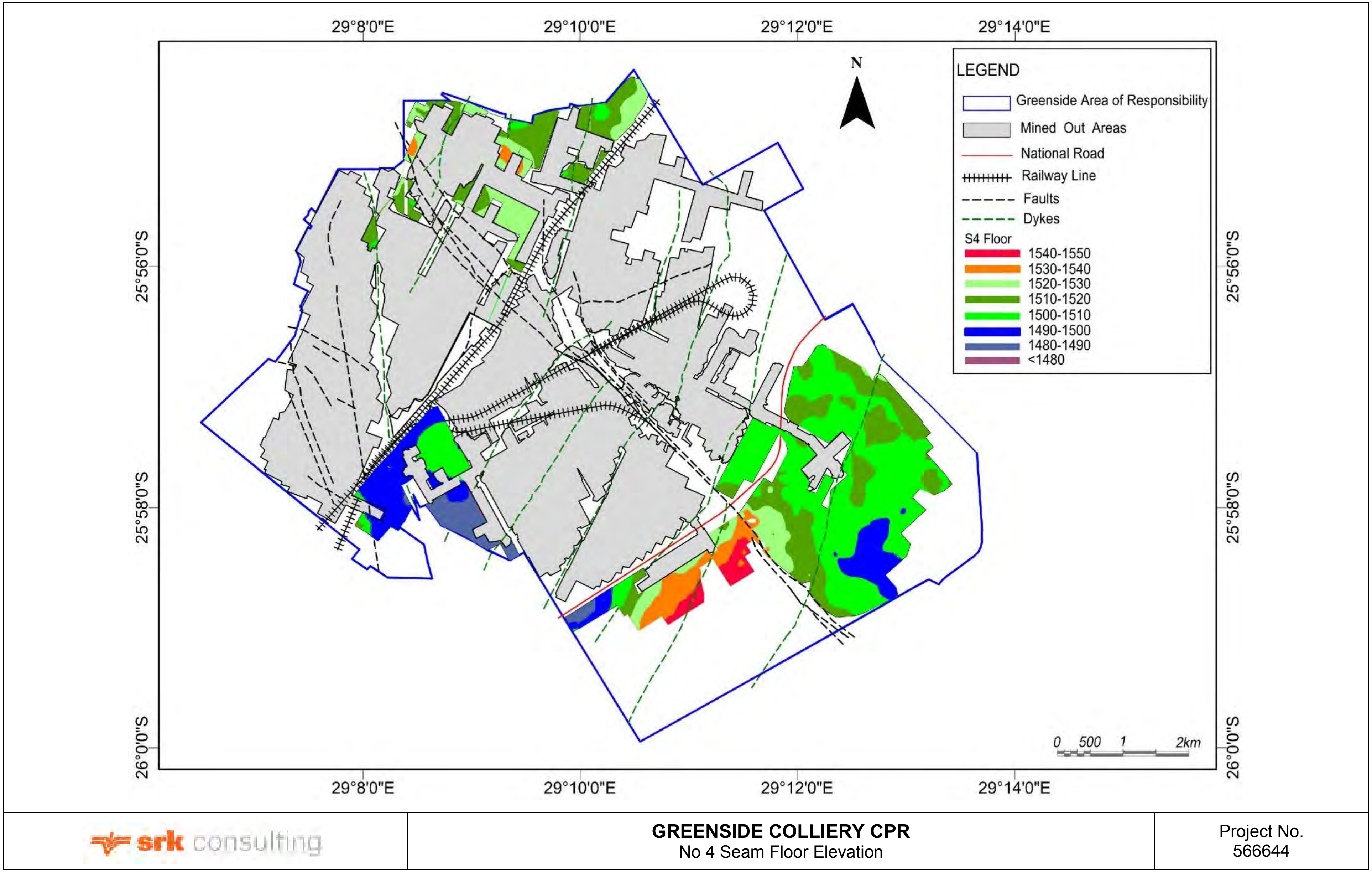

Figure 6-4: No 4 Seam Floor Elevation (mamsl)

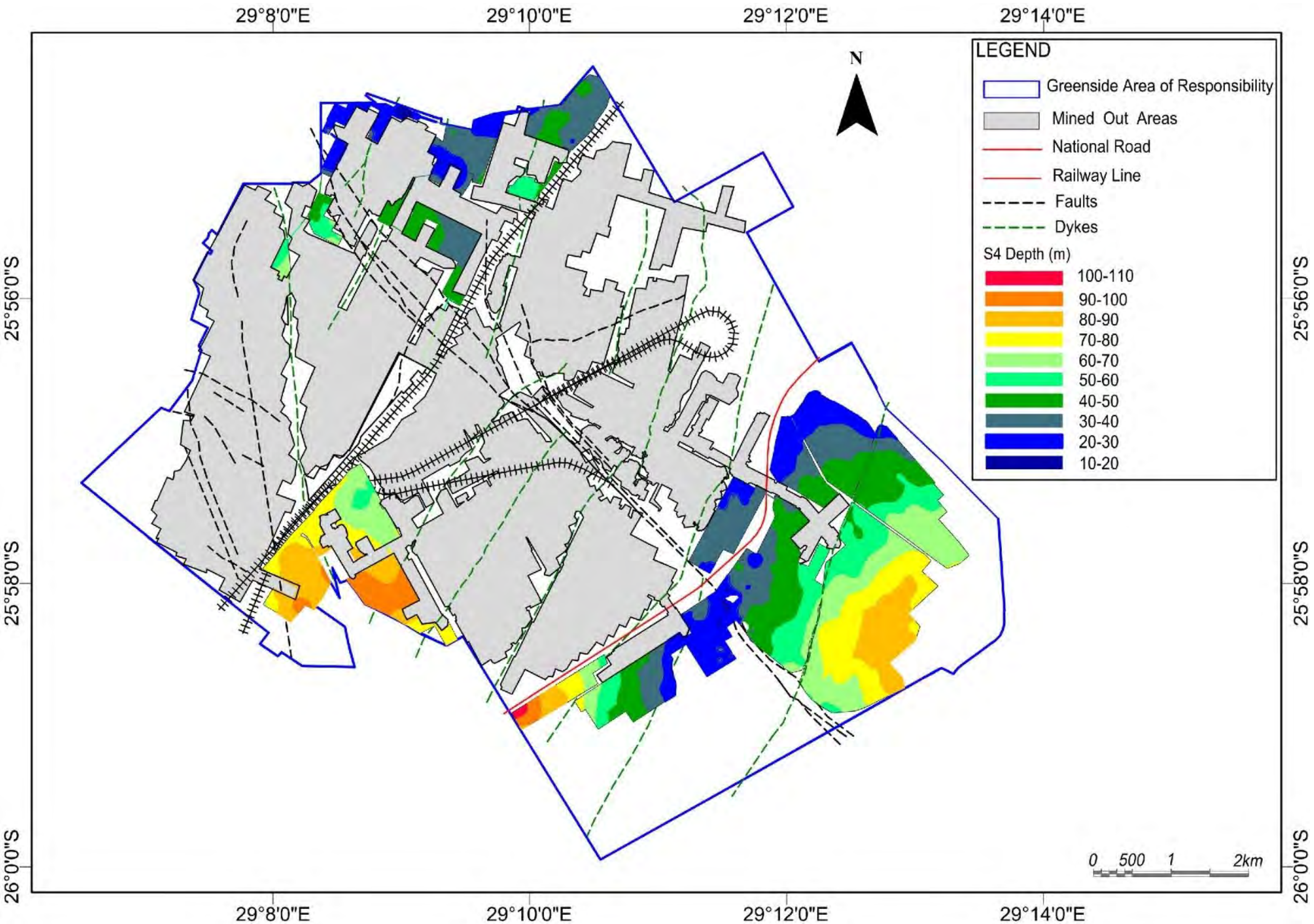

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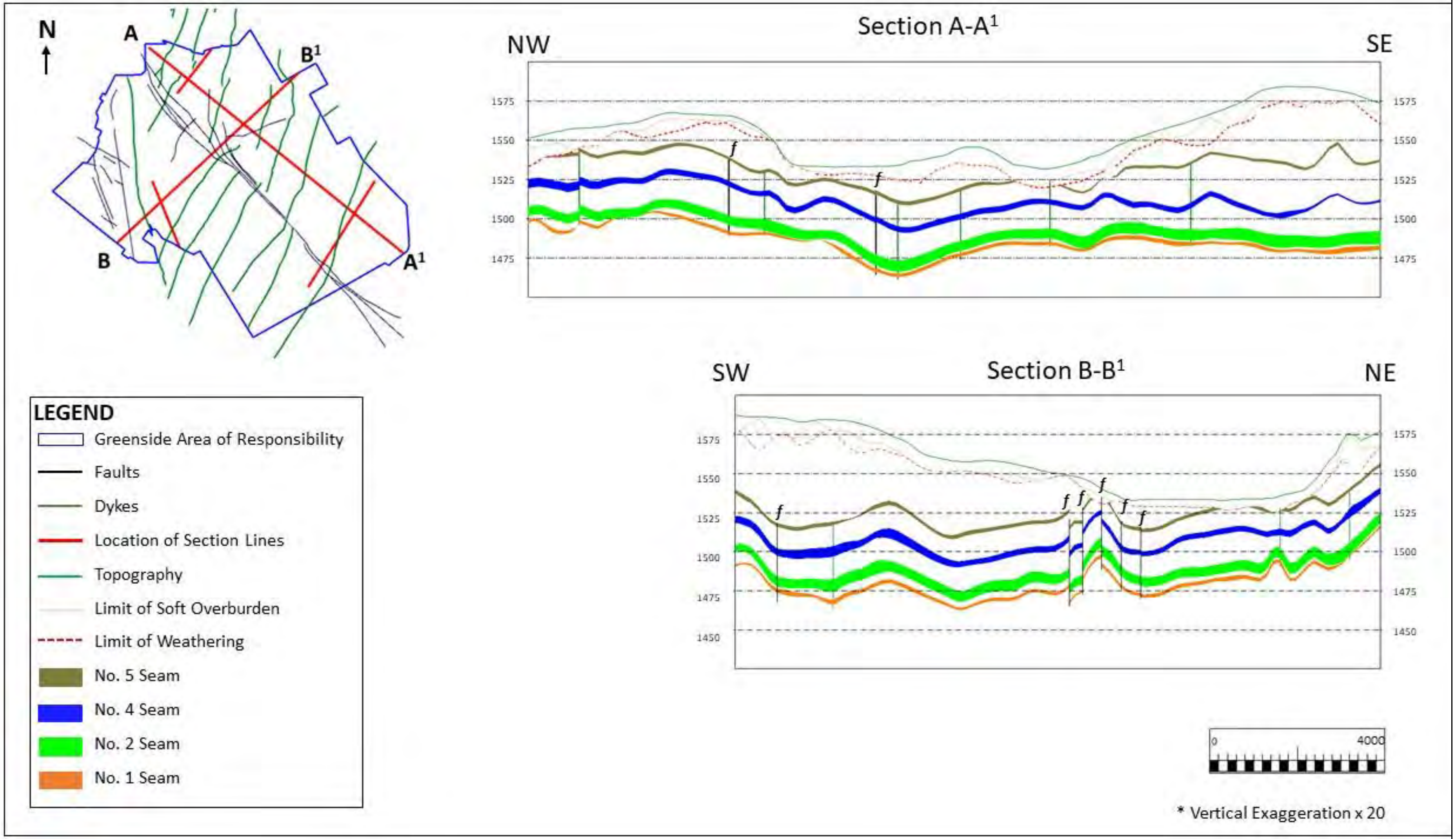
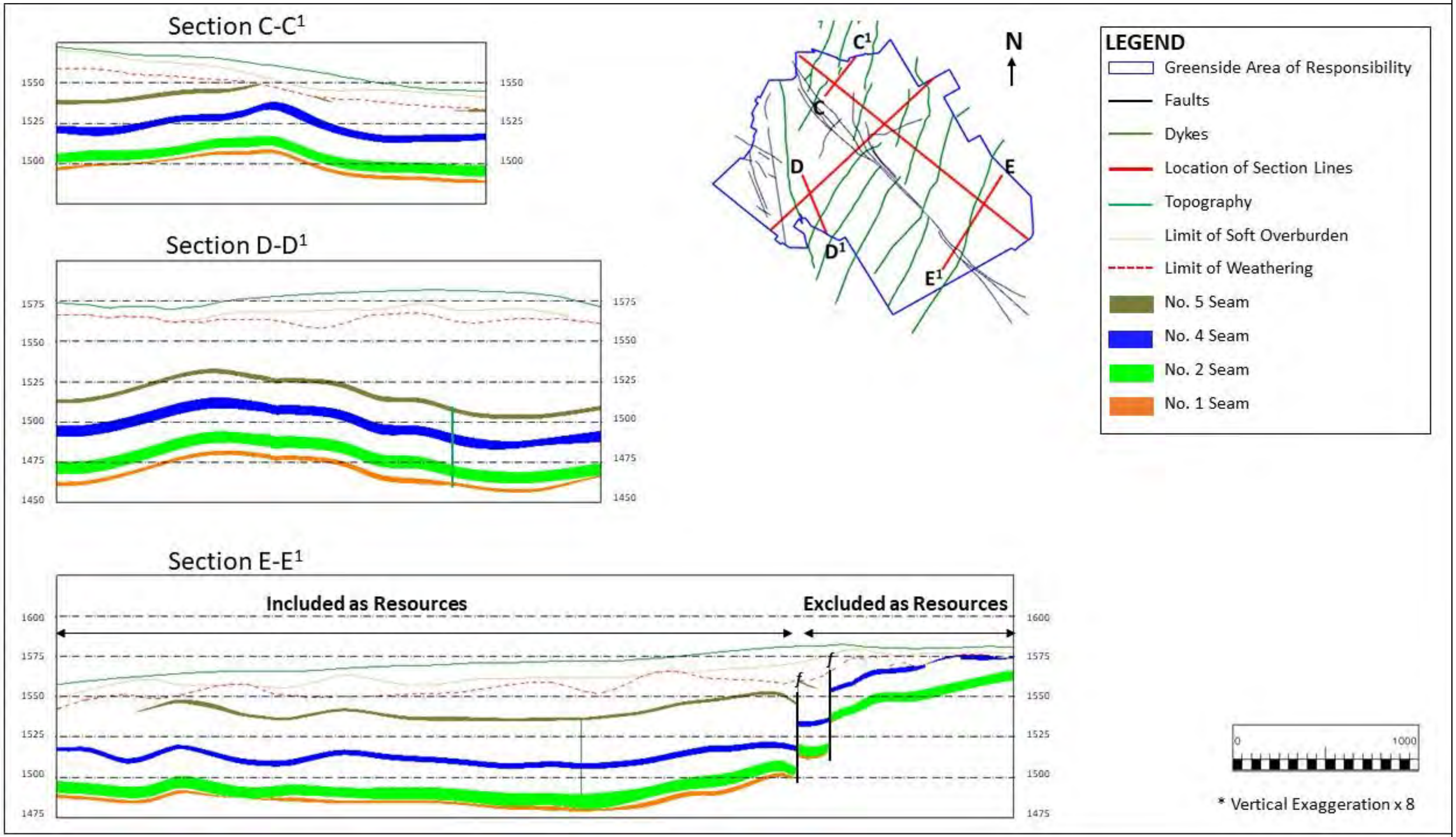
Figure 6-5: No 4 Seam Depth to Roof (m)



srk consulting	**GREENSIDE COLLIERY CPR** Cross Sections A-A' and B-B"	Project No. 566644

Figure 6-6: Cross Sections A-A' and B-B'



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GREENSIDE COLLIERY CPR
Cross Sections C-C', D-D' and E-E'

Project No.
566644

Figure 6-7: Cross Sections C-C', D-D' and E-E'

6.3.2. Raw Coal Quality

[SR4.1(iv), SR4.6(i)]

The raw adb quality parameters Ash, CV[1], IM, FC, VM and TS were modelled. The average qualities were estimated by weight-averaging the individual ply qualities on both thickness and density. Plans detailing the modelled raw qualities and associated frequency distributions are shown in Figure 6-8 to Figure 6-11.

Raw Ash

Examination of the raw ash contour plot illustrates that the ash content is generally below 25%, although higher values are encountered towards the western edge of Central Block and the eastern edge of East Block where the seam thins (cf Figure 6-3). Examination of the ash frequency distributions indicates that in the West Block, 64% of the coal has an ash content less than 25%; in the Central Block there is a more widely spread distribution of ash content and in the East Block, the ash content distribution is similar to that in the West Block (67%).

Raw Calorific Value

The raw CV[1] in the West Block is between 24 and 26 MJ/kg, where 53% of the coal has a CV[1] greater than 24 MJ/kg. The CV[1] in the western part of the East Block is similar, but decreases rapidly towards the east, showing a similar distribution pattern to that of the increasing ash content in this area. The frequency distribution is approaching a bimodal pattern, reflecting these two regimes of a higher CV[1] area and a lower CV[1] area associated with the higher ash content. The Central Block has in general lower average CV[1]s, between 22 and 24 MJ/kg, although with a normal distribution pattern.

Raw Total Sulphur

Raw TS in the West Block is generally between 1.3 and 1.9% (53% of the coal), while it is lowest in the Central Block (generally less than 1.5%), although there are some scattered areas with high TS (2.4%). This is likely to be inorganic sulphur (generally pyrite) that is removed during washing. Large portions of the East Block have high TS (80% of the coal has total sulphur content between one and 2.2%). The sulphur distribution here is more erratic, with distinct patches of lower TS coal interspersed with areas of higher TS coal.

Raw Volatile Matter Content

VM is around 22 - 24% over much of the GAR, although slightly lower (20 – 22%) along the western edge of the Central Block. There are three areas in the West Block where the VM is > 24%, as well as some small, isolated patches of low VM coal (< 17%) along the northeastern edge of East Block, along the Khwezela South boundary.

6.3.3. Washed Coal Product

The Company stores standardised wash tables in the geological model; these wash tables conform to user-defined density fractions and can be used to estimate potential products and their associated Coal Resources. The density fractions defined for Greenside are:

- Float fractions: 1.3, 1.35, 1.4, 1.45, 1.5, 1.6, 1.7, 1.8; and
- Sink fraction 2.0

All wash tables are standardised using an in-house Company software package, Prodint5b, which simulates potential products (coal qualities and yields) using prescribed parameters such as contamination and organic efficiency. This is done by fitting a curve to the quality/yield relationship interpolations and also uses various formulae for extrapolation. This procedure requires a minimum of four valid points on a wash table; wash tables with less than four analysed density fractions or four float fraction yields are excluded. Stratmodel is able to generate an average wash table for each resource block, using the inverse distance cubed interpolator, using thickness and yield as the weighting factors.

The Company uses Prodint5b, Gradecon (also an in-house Company software package) and XPac to estimate theoretical and practical products and yields. Various product options are investigated, combining the impact of seam/sub-seam combinations, quality requirements and changes in mining equipment.

No qualities or resource tonnages are estimated for any of the coal products by the geologists; this is done at a later stage by other technical experts in the mining and mine planning disciplines.

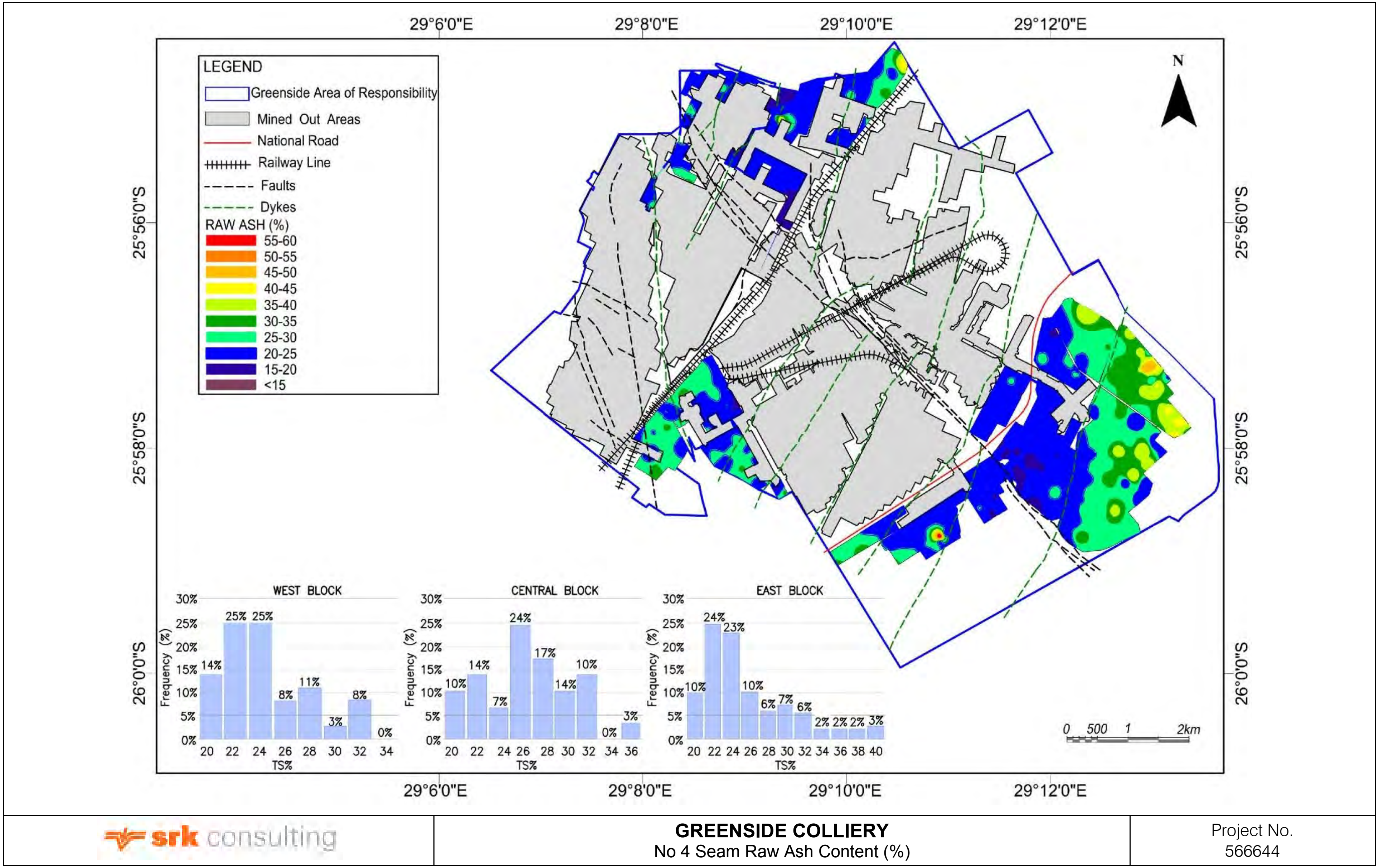

Figure 6-8: No 4 Seam Raw Ash Content (%)

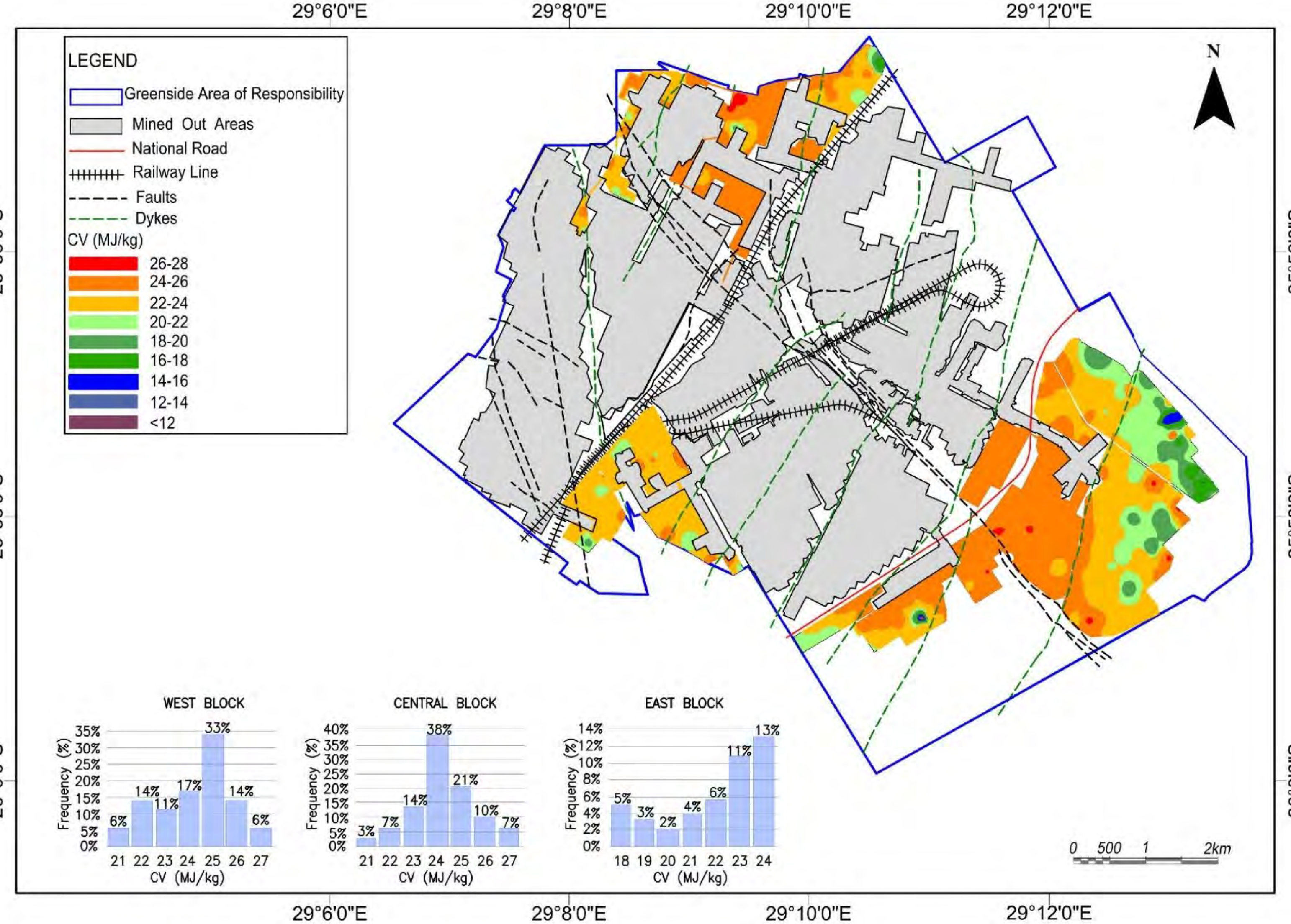

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Figure 6-9: No 4 Seam Raw Calorific Value (MJ/kg)

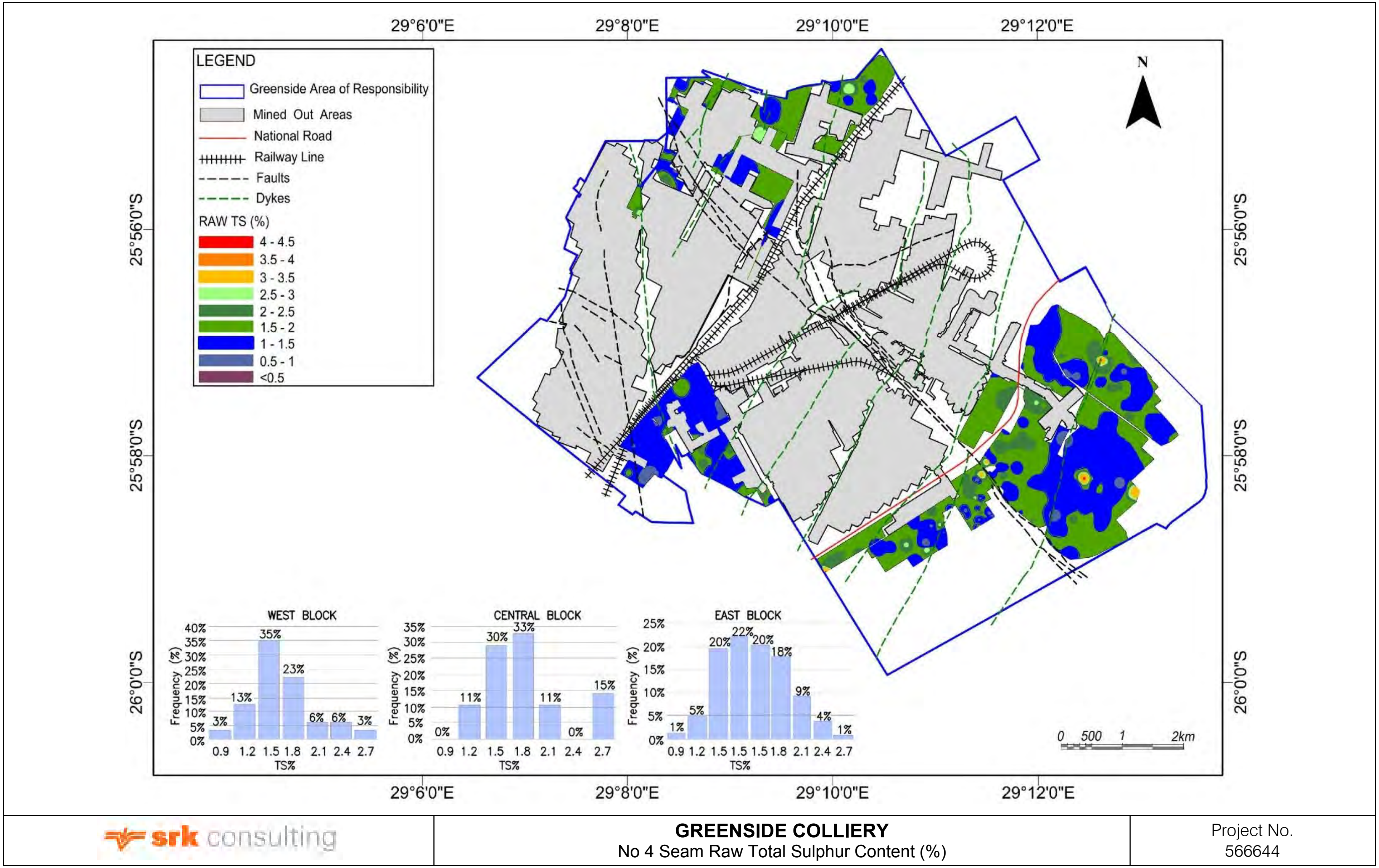


Figure 6-10: No 4 Seam Raw Total Sulphur Content (%)

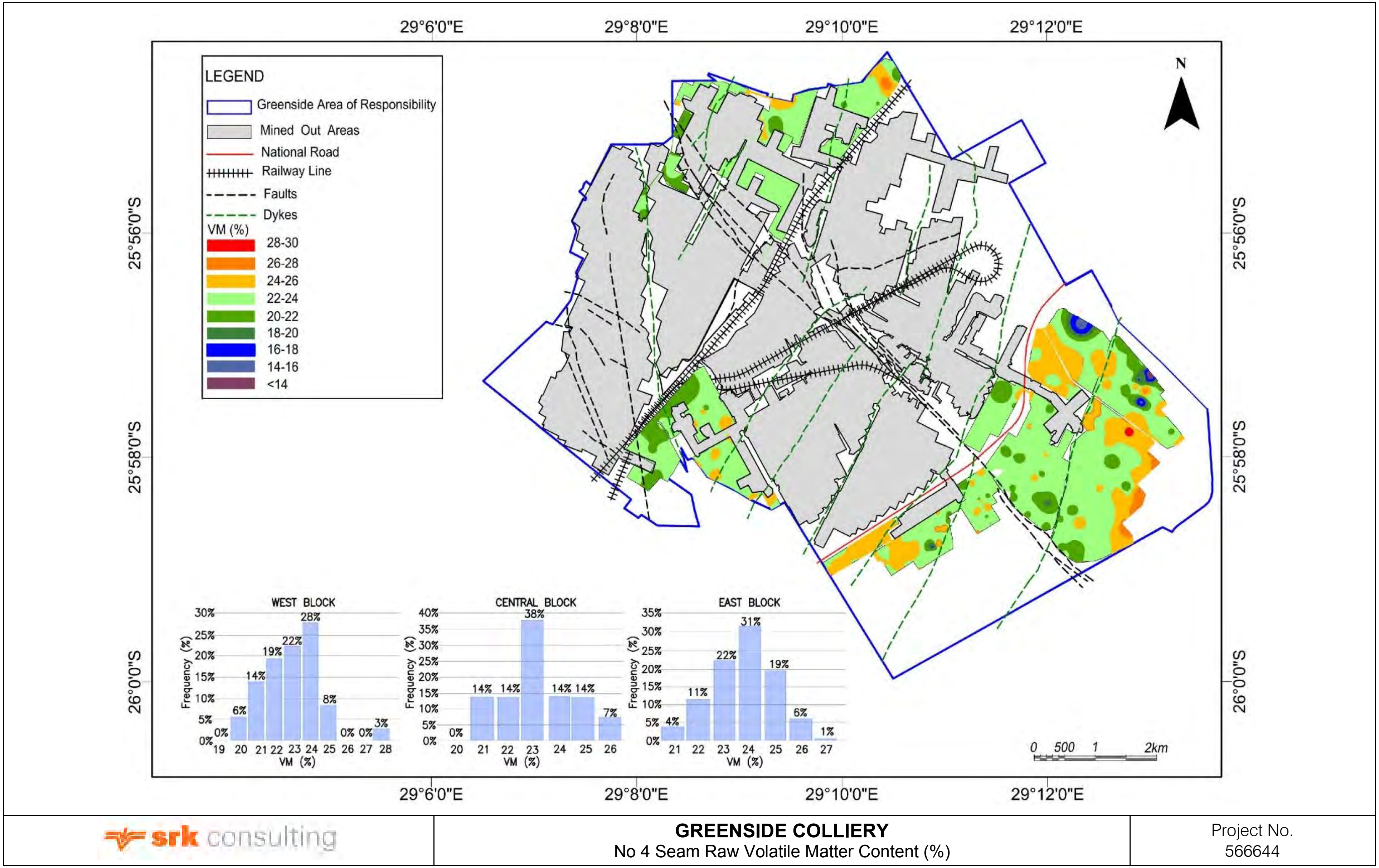


Figure 6-11: No 4 Seam Raw Volatile Matter Content (%)

6.4. Reasonable Prospects for Eventual Economic Extraction

[SR4.1(iv), SR4.2(ii)(iii)(iv), SR4.3, SR5.6(iii)(iv)]

Both the SAMREC Code and SANS10320:2020 provide guidelines on the determination of Reasonable Prospects for Eventual Economic Extraction (**RPEEE**). Table 1 of the SAMREC Code requires disclosure and discussion of the following items "*which, in the opinion of the Competent Person, are likely to influence the prospect of economic extraction"* (SAMREC Code, 2016). SRK has considered those items which it believes impacts on the prospects for extraction; they are listed below, together with the section in this report where they have been addressed:

- The geological parameters, including volume/tonnage, grade and value/quality estimates, cut-off grades and strip ratios (Sections 6 and 9);
- The engineering parameters, including mining method, dilution, geotechnical, geohydraulic, and coal processing parameters (Sections 8, 7, 16, 10);
- Infrastructure including power, water and access to site (Sections 2.4 and 12);
- Legal, governmental, permitting and statutory parameters (Section 3);
- Environmental and social parameters (Section 15);
- Marketing parameters (Section 17);
- The economic assumptions and parameters, including the coal price, capital and operating costs (Section 19);
- Any material risks (Section 0); and
- The parameters used to support the concept of "eventual" (the colliery has been in operation for over 60 years and has projected remaining LoM of seven years in the current schedule).

SANS10320:2020 states that there should be reasonable expectations that the coal deposit will be economically mineable and extractable and that a saleable raw or beneficiated coal product can be produced. The criteria that are used to determine this should consider the items below; the section referred to after the item is the section in this report where these items are discussed:

- Seam thickness and depth below surface (Section 6.3.1)
- The potential mining method (Section 8.3);
- The coal qualities (Section 6.3.2);
- The theoretical product yield and the target product quality (Section 6.3.3);
- The surface infrastructure (Section 2.4);
- Natural and manmade features that may impact on the extraction (Sections 4.3 and 2.4); and
- The time period over which this extraction might be possible (Section 8.8).

The Company states it has followed the SAMREC Code, 2016 and SANS10320:2004 guidelines, as well as internal company guidelines:

- Anglo American Group Technical Standards AA GTS 25 and AA RD 22-25; and
- AAC standard (AAC SD 23-35-104 Resource-Reserve Reporting);
    - AAC RD 23-35-104B: Determination of Reasonable Prospects for Eventual Economic Extraction (RPEEE) Requirements Document;
    - AAC CK 23-35-104A: Factors for the Determination of RPEEE.

A detailed Resource Risk Assessment was undertaken by the Company's CP (Mr M Simakuhle).

6.5. Resource Category Classification

[SR4.4(i)]

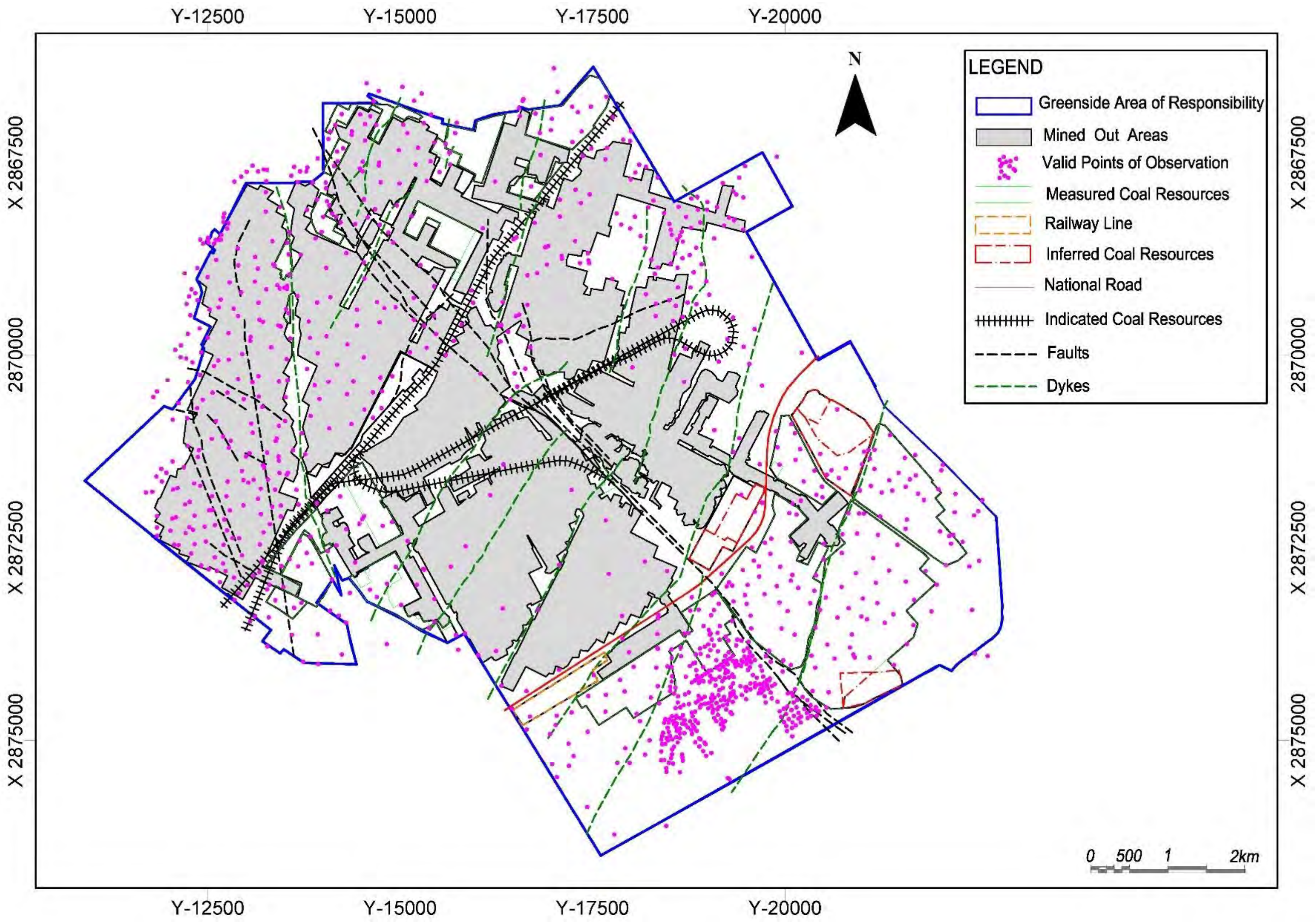
This CPR has been compiled in accordance with SANS10320:2020, although the Company documentation reviewed was compiled in accordance with SANS10320:2004. This does not impact on the Coal Resource estimation and classification, nor in the criteria used to determine the classification.

The coal seams at Greenside are of the multiple seam coal deposit-type, defined in SANS10320:2020 as "characterised by a discrete number of coal seams, typically between 0.5 m and 7.0 m in thickness, separated by interburden units with a thickness that generally significantly exceeds the thickness of the individual coal seams". The resource classification is based on the geological knowledge of the deposit, including that gained from mapping, remote sensing, geophysics, etc. and drilling.

The categories of Coal Resources are based on the level of confidence, as determined by the CP, in the estimate of both tonnage and coal quality. The drill hole spacing for each Coal Resource classification category, as outlined in the SAMREC Code coal-specific guidelines (SANS 10320:2020) represents the minimum requirement for resource classification (summarized for multiple seam coal deposits). Any deviation from the minimum standard must be fully justified and reported by the CP. The basis of Coal Resource statements in terms of drill hole spacing, seam structure, coal seam thickness cut-offs, physical coal seam continuity, relevant coal quality cut-offs, coal quality continuity, coal quality variability, computer-modelling techniques, classification principles and estimation confidence must be stated. Classification was guided by the following:

- Drill hole density;
- Geological and coal quality continuity;
- Geological structure and its influence on mining; and
- Complexity of the deposit geology.

Only valid Points of Observation (**PoO**) may be used to determine the resource classification categories. This is based on the number of cored drill holes that have appropriate quality data; in the case of Greenside, which produces a washed coal product, washed coal quality data is required for a drill hole to be considered a PoO. The drill holes determined by SRK to be valid PoOs are shown in Figure 6-12.



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GREENSIDE COLLIERY CPR
Valid Points of Observation

Project No.
566644

Figure 6-12: Valid Points of Observation

Drill hole spacing is used as a proxy for data density; for coal that is of the multiple seam coal deposit-type, the following minimum drill hole spacings apply:

- Inferred Coal Resource 1 000 m;
- Indicated Coal Resource 500 m; and
- Measured Coal resource 350 m.

This translates to a drill hole density as follows:

- Inferred Resource, one cored drill hole with washed coal quality data per 100 ha;
- Indicated Resource, four cored drill holes with washed coal quality data per 100 ha; and
- Measured Resource, eight cored drill holes with washed coal quality data per 100 ha.

The drill hole density (valid PoO) and resource classification for the No 4 Seam in the three areas is shown in Table 6-4.

Table 6-4: Drill Hole Density

Block	Area (ha)	Number of PoO	PoO per 100 ha	Classification
West	236.16	126	53	Measured
Central	170.30	48	28	Measured
East	494.94	214	43	Measured
	26.61	8	30	Indicated
	72.37	19	26	Inferred

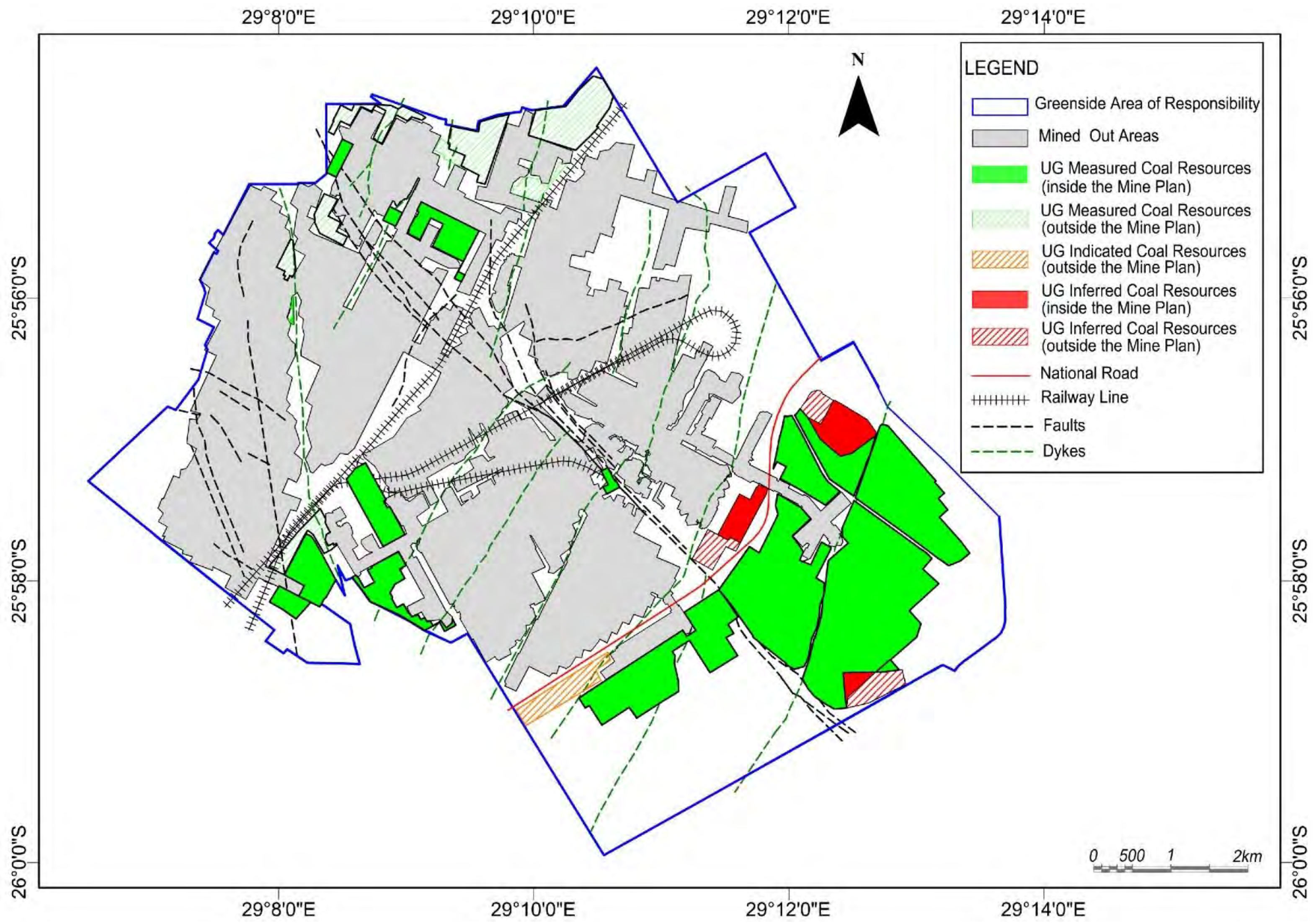
The polygons and their resource category classification selected by SRK for inclusion in the Coal Resource estimation (Figure 6-13) differ slightly from those selected by the Company (Figure 6-14). The differences are:

- The northeastern edge of the Central Block where several small blocks have been excluded; and
- The downgrading of the three Indicated Coal Resource polygons in the East Block to the Inferred Coal Resource category, due to insufficient drill hole coverage. This also resulted in the use of a slightly higher geological loss (15% as opposed to 12.5%).

Note that SRK did not change the shape or size of the polygons; we only excluded some polygons based on the reasons given above.

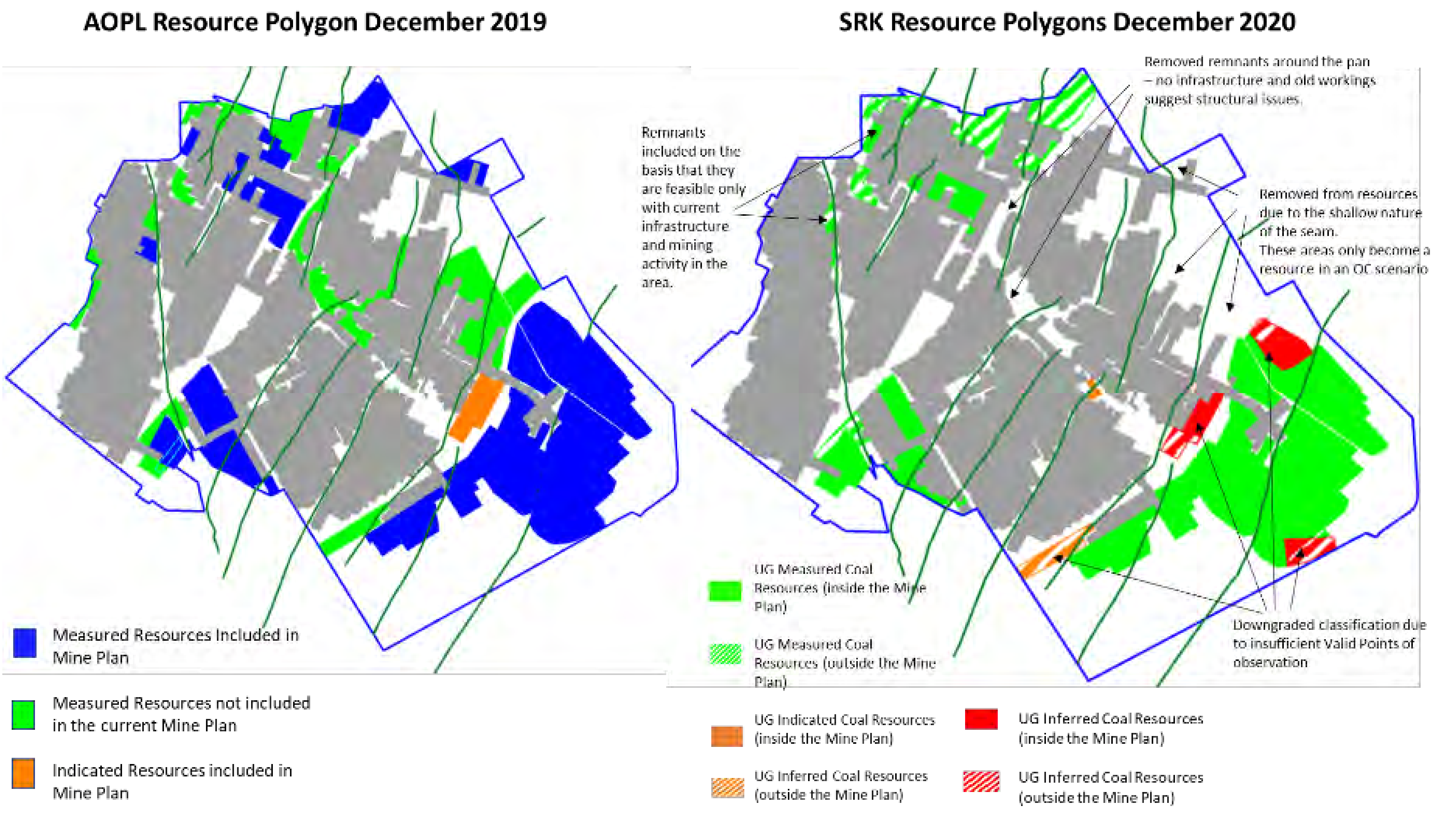
The classification of Coal Resources into Inferred, Indicated and Measured categories is a function of increasing geological confidence in the estimate based on the density of points of observation, the physical continuity of the coal seams, the distribution and the reliability of the coal sampling data, the coal quality continuity, the reliability of the geological model and the estimation methods. Factors that contribute to the uncertainty in Coal Resource estimation include the key constraints used to construct the geological model, such as the seam thickness variation, structural complexity and the coal quality distribution. Figure 6-13 illustrates the resource categories for the No 4 Seam.

It should be noted that Coal Resource tonnages are estimates with an associated degree of uncertainty in the actual values. Uncertainty is introduced by the key constraints used to construct the geological model, such as the coal seam thickness variation, structural complexity, and the coal quality distribution.



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Resource Classification (SRK)	Project No. 566644

Figure 6-13: No 4 Seam Resource Classification (SRK)



srk consulting	**GREENSIDE COLLIERY CPR** Comparison of the Company's and SRK's Resource Polygons	Project No. 566644

Figure 6-14: Comparison of the Company's and SRK's Resource Polygons

6.6. Reporting Definitions

The SAMREC Code, 2016 requires that only the Mineable Tonnes *In situ* (**MTIS**) Coal Resource estimate is reported (Clause 55). Reporting definitions as extracted from SANS0320:2020 are given in Table 6-5 and have been adhered to in this report.

Table 6-5: Summary of Reporting Definitions (SANS10320:2020)

Category	Definition
Mineable Tonnes *In situ* (**MTIS**)	The tonnage and coal quality, at a specified moisture content, contained in the coal seam, or section of the coal seam, which is proposed to be mined, at the theoretical mining height, adjusted by the geological loss factors and de-rating factors for previous mining activities, with respect to a specific mining method and after the relevant minimum and maximum mineable thickness cut-offs, depth cut-off and relevant coal quality cut-off parameters have been applied. *NOTE 1 Mineable Tonnes In situ (MTIS) Coal Resources are subdivided in order of increasing geoscientific knowledge and confidence into Inferred, Indicated or Measured Mineable Tonnes In situ Coal Resource categories.* *NOTE 2 The geological loss factor is applied to the Gross Tonnes In situ tonnage estimates and, therefore the impact of the geological loss is included in the Mineable Tonnes In situ Coal Resource tonnage estimates.*
Measured Coal Resource	That part of a Coal Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of modifying factors to support detailed mine planning and final evaluation of the economic viability of the deposit. *NOTE 1 Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Coal Resource has a higher level of confidence than that applying to either an Indicated Coal Resource or an Inferred Coal Resource. It may be converted to a Proved Coal Reserve or to a Probable Coal Reserve.* *NOTE 2 A Measured Coal Resource is defined by coal meeting the thickness cut-offs, depth cut-offs, and the relevant coal quality cut-offs, as defined by the competent person, which meets the criteria for reasonable prospects for eventual economic extraction.* *NOTE 3 Although a Measured Coal Resource has sufficient confidence to allow Coal Resource estimation and life of mine planning, it does not imply that further drilling and sampling would not be needed for optimization purposes prior to mining taking place.*
Indicated Coal Resource	That part of a Coal Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. *NOTE 1 Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Coal Resource has a lower level of confidence than that applying to a Measured Coal Resource and may only be converted to a Probable Coal Reserve.* *NOTE 2 An Indicated Coal Resource is defined by coal above the minimum thickness cut-off, depth cut-off, and the relevant coal quality cut-offs, as defined by the competent person, which meets the criteria for reasonable prospects for eventual economic extraction.* *NOTE 3 The level of confidence in an Indicated Coal Resource is usually sufficient to support a decision on whether a pre-feasibility study or feasibility study is warranted.*
Inferred Coal Resource	That part of a Coal Resource for which quantity and coal quality are estimated on the basis of limited geological evidence and sampling and shall not be converted to a Coal Reserve. *NOTE 1 Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Coal Resource has a lower level of confidence than that applying to an Indicated Coal Resource. It is reasonably expected that the majority of Inferred Coal Resources could be upgraded to Indicated Coal Resources with continued exploration.* *NOTE 2 An Inferred Coal Resource is defined by coal above the minimum thickness cut-off, depth cut-off, and the relevant coal quality cut-offs, as defined by the Competent Person, which meets the criteria for reasonable prospects for eventual economic extraction.* *NOTE 3 The level of confidence in an Inferred Coal Resource is usually insufficient to justify a pre-feasibility study.*

6.7. Coal Resource Cut-off Parameters

[SR 4.1(vi) SR4.2(i)(ii)(vi)]

SRK applied the following cut-off parameters when estimating the resources:

- The seam extent was constrained by:
  - The Mining Right boundary; and

  - The limit of weathering;

• Maximum ash content	50%;
• Minimum volatile matter content	17%;
• Minimum seam thickness/theoretical mining height	2.0 m; and
• Maximum theoretical mining height	4.5 m.

Note that a DAFV cut-off is not used at Greenside.

6.8. Coal Resources Estimates

[12.10(a)] [SR1.4(iii), SR4.1(iv), SR4.5(ii)(iv)(v)(vii), SR6.1(i), SR6.3(vi)] [SV1.9]

All Coal Resources are reported inclusive of the Coal Reserves.

The Coal Resource estimates were conducted in accordance with the SAMREC Code, 2016 Edition, as well as SANS10320:2020.

The Coal Resource estimates have been independently estimated by Ms K. Black of KJB GeoServices and signed off by Ms L. Jeffrey on behalf of SRK, based on the model supplied by the Company and verified by SRK. The Coal Resource estimate is declared as at 31 December 2020.

The Greenside Coal Resource on an MTIS air-dried basis (**adb**) amounts to 65.37 Mt. This estimate is made up of Measured, Indicated and Inferred *in situ* Coal Resources, both inside and outside of the Mine Plan (57.17 Mt), and the tonnage ascribed to the MRD (8.2 Mt).

The *in situ* Greenside Coal Resource on an MTIS adb amounts to 57.17 Mt. The estimate is made up of 51.08 Mt of *in situ* Measured Coal Resources (89%), 1.59 Mt of *in situ* Indicated Coal Resources (3%), 4.5 Mt of *in situ* Inferred Coal Resources (8%). The 8.2 Mt of Measured Coal Resources derived from the MRD comprises 12.5% of the total Greenside Coal Resource estimate of 65.37 Mt. The average inherent moisture (**IM**) of the *in situ* material is 2.2%. The estimate for the MRD is that as determined by the Company; SRK has reviewed the methodology employed by the Company to estimate the potential MRD resources and is of the opinion that is has been done conservatively and correctly; the MRD estimate is included in SRK's Coal Resource Statement (in a separate table). The remaining volume of material in the MRD is significantly larger than indicated in the Coal Resource Statement but requires further evaluation before it can be classified as a Coal Resource.

The Coal Resources for Greenside on a total basis[5] (100% attributable to Greenside) at 31 December 2020 are summarised in Table 6-6 (*in situ coal*) and Table 6-8 (MRD material); the raw coal qualities pertained to the *in situ* Coal Resources are shown in Table 6-7 and those for the MRD in Table 6-8.

The Coal Resources have been subdivided into those inside and outside the Life of Mine Plan, which has been determined using the specified mine design parameters within the economic footprint (SANS 10320:2020, clauses 3.2.5, 8.1.1.1, 8.1.2.3 and Table F1).

Coal Resources inside the Mine Plan are reported inclusive of the Coal Reserves.

Provision has been made for a geological loss factor (discount). Losses may occur mainly as a result of intersection of dolerite dykes, faulting and other unforeseen geological losses. SRK believes the 7% geological loss used by the Company for Measured Coal Resources is appropriate. However, SRK has increased the geological loss to 12.5% for the Indicated Resources as the polygon is transected by a dyke. A geological loss of 15% has been applied to the Inferred Coal Resources.

The Measured Coal Resource polygon in East Block was terminated against the southern portion of the fault; however, further northwest along that same fault, the polygon straddles the fault. SRK is of the opinion that poor ground conditions in this area as a result of the fault will cause a loss of resources, in the order of 0.4 Mt. Examination of the mined out areas on the No 2 Seam in this area show that mining stopped well in advance of

[5] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to the Greenside Area of Responsibility and is equivalent to the term "gross" used in the AIM Mining Guidance.

the fault. It is highly likely that a similar scenario will prevail when extracting the No 4 Seam. Note that this 0.4 Mt has **not** been excluded from the Coal Resource estimate; the potential impact of the fault on the resource estimate is simply highlighted here.

Table 6-6: Greenside No 4 Seam MTIS Coal Resource Statement as at 31 December 2020 (adb)

Block	Resource Classification Category	Mining Method	Seam	Theoretical Mining Height (m)	Area (ha)	Seam Thick-ness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
INSIDE THE MINE PLAN									
West Block	Measured	UG+BP	No 4	2.0 – 4.8	43.89	3.92	1.51	7.0	2.38
Central Block	Measured	UG+BP	No 4	2.0 – 4.8	107.09	4.43	1.55	7.0	6.85
	Indicated	UG+BP	No 4	2.0 – 4.8	2.10	2.40	1.52	12.5	0.07
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**109.19**	**4.40**	**1.55**	**7.1**	**6.92**
East Block	Measured	UG+BP	No 4	2.0 – 4.8	716.99	3.10	1.57	7.0	32.45
	Inferred	UG+BP	No 4	2.0 – 4.8	58.40	3.15	1.6	15.0	2.5
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**775.38**	**3.10**	**1.57**	**7.6**	**34.95**
Total Inside the Mine Plan		**UG+BP**	**No 4**	**2.0 – 4.8**	**928.47**	**3.35**	**1.57**	**7.5**	**44.25**
OUTSIDE THE MINE PLAN									
West Block	Measured	UG+BP	No 4	2.0 – 4.8	145.13	3.90	1.54	7.0	7.89
Central Block	Measured	UG+BP	No 4	2.0 – 4.8	19.84	4.78	1.56	7.0	1.37
East Block	Measured	UG+BP	No 4	2.0 – 4.8	2.37	3.80	1.63	7.0	0.14
	Indicated	UG+BP	No 4	2.0 – 4.8	30.87	3.59	1.57	12.5	1.52
	Inferred	UG+BP	No 4	2.0 – 4.8	45.52	3.34	1.6	15.0	2.0
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**78.76**	**3.50**	**1.59**	**13.7**	**3.66**
Total Outside the Mine Plan		**UG+BP**	**No 4**	**2.0 – 4.8**	**243.73**	**3.87**	**1.56**	**8.9**	**12.92**
GRAND TOTAL (Inside + Outside the Mine Plan + MRD)			**-**	**-**	**1172.20**	**3.47**	**1.56**	**7.8**	**57.17**

Notes:
1. Total is 100% of the Coal Resources attributable to the mining licence and is equivalent to the term gross used in the AIM Mining Guidance.
2. Coal Resources quoted in decreasing order of geological confidence.
3. Fresh coal only, and coal within Mining Right boundary.
4. UG+BP = Underground Bord and Pillar.
5. OC = Opencast.
6. Minimum seam thickness/theoretical mining height cut-off of 2.0 m.
7. Theoretical mining height cut-off of 4.5 m.
8. Ash < 50% cut-off applied.
9. VM > 17% cut-off applied.
10. ARD – Apparent Relative Density.
11. All seam thicknesses used are true thicknesses.

Table 6-7: Greenside No 4 Seam Average Raw Coal Qualities (adb) as at 31 December 2020

Block	Resource Classification Category	Seam	ASH (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)
INSIDE THE MINE PLAN								
West Block	Measured	No 4	21.2	24.63	53.6	2.4	1.44	22.9
Central Block	Measured	No 4	24.8	23.05	50.0	2.6	1.30	22.8
	Indicated	No 4	22.0	24.58	52.3	2.4	1.46	23.3
	Subtotal		**24.7**	**23.06**	**50.0**	**2.6**	**1.30**	**22.8**
East Block	Measured	No 4	26.4	23.09	48.1	2.3	1.59	23.2
	Inferred	No 4	26.3	23.2	48.8	2.4	1.8	22.5
	Subtotal	No 4	**26.4**	**23.10**	**48.1**	**2.3**	**1.61**	**23.2**
Average Inside the Mine Plan		**No 4**	**25.8**	**23.18**	**48.7**	**2.4**	**1.55**	**23.1**
OUTSIDE THE MINE PLAN								
West Block	Measured	No 4	23.8	23.82	50.8	2.3	1.73	23.0
Central Block	Measured	No 4	24.8	23.12	50.4	2.8	1.25	22.0
East Block	Measured	No 4	31.1	21.13	41.5	2.2	1.92	25.2
	Indicated	No 4	26.0	23.07	47.2	2.4	1.82	24.4
	Inferred	No 4	26.0	23.3	48.5	2.4	1.7	23.1
	Subtotal	No 4	**26.2**	**23.14**	**47.7**	**2.4**	**1.74**	**23.7**
Average Outside the Mine Plan		**No 4**	**24.6**	**23.55**	**49.9**	**2.4**	**1.68**	**23.1**
AVERAGE		**-**	**25.6**	**23.26**	**49.0**	**2.4**	**1.58**	**23.1**

Notes:
1. Weighted average qualities estimated on MTIS.
2. adb = air dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.

6.8.1. Greenside MRD Coal Resource Estimate

The Greenside MRD (derived from No 5, No 4, No 2 and No 1 Seam discard material) contains a Gross Tonnes In Situ estimate of 8.2 Mt of material with an average moisture content of 2.2%' an average CV1 of 15.78 MJ/kg adb and a bulk density of 1.60 g/cm (Table 6-8). Analysis of this material suggests that with beneficiation, a 21.57 MJ/kg product at a theoretical yield of approximately 56% at a cut-point density of 1.84 g/cm could be produced.

The volumes and qualities for the MRD were modelled by the Company's Resource Evaluation Department using the StratModel™ version 6.1.2 geological modelling software. The data modelled were derived from approximately 33 drill holes, 414 raw/cumulated samples and 157 washed samples to estimate raw quality and product estimates for the MRD. Eleven layers were modelled to assess the vertical variation in quality. The top surface of the MRD was based on a flown DTM (dated 27 November 2019). The model is dated November 2019 and the tonnage estimate has been depleted by mining that occurred during 2020. Note that the model has not been updated to derive revised qualities.

A theoretical wash product was estimated at an average cutpoint density of 1.84 g/cm^3. All quality values presented are theoretical and on an air-dried basis.

Portions of the MRD that have been included in the estimate are the Bullnose, the East and West Flanks and some material that has recently been upgraded to Coal Resources. New and old slimes areas are excluded. Volumes towards the base of the MRD in proximity to 1535 – 1540 mamsl have been excluded in the estimate due to uncertainty of the MRD base surface.

Table 6-8: Greenside MRD Coal Resource Estimate (Inside the Mine Plan) (adb)

Area	Block Area (ha)	Volume (Mm^3)	GTIS (Mt)	Ash (%)	Bulk Density (g/cm^3)	CV[1] (MJ/kg)	IM (%)	TS (%)
Bullnose	11.265	1.059	1.694	44.24	1.60	16.18	2.1	2.75
West Flank	8.202	1.539	2.462	46.22	1.60	15.50	2.0	2.97
East Flank	13.303	3.081	4.929	45.71	1.60	15.65	2.1	2.83
Upgraded	4.890	0.838	1.340	42.45	1.60	16.25	2.7	3.43
Subtotal (2019 estimate)	***32.770***	***6.516***	***10.426***	***45.17***	***1.60***	***15.78***	***2.2***	***2.93***
Less mining during 2020			2.226					
Total (2020 estimate)			**8.2**					

Notes:
1. GTIS = Gross Tonnes *In Situ*
2. Weighted average qualities estimated on GTIS.
3. adb = air dried basis.
4. CV[1] - Calorific Value, IM - Inherent Moisture, TS - Total Sulphur.

6.9. Reconciliation with the Previous Coal Resource Estimate

[SR1.4(iii), SR4.5(vi)] [SV1.6]

Table 6-9 shows the reconciliation between the 2020 and 2019 Coal Resource estimates. The 2020 estimate was done by SRK, while the 2019 estimate was done by the Company (2019b).

Table 6-9: Reconciliation with the Previous Resource Estimate

Block	Resources Classification Category	Seam	MTIS Coal Resources			
			Mass (Mt)		CV[1] (MJ/kg)	
			2020	2019	2020	2019[1]
Greenside	Measured	No 4	51.08	54.5	23.27	23.03
	Indicated	No 4	1.59	2.3	23.14	23.53
	Inferred	No 4	4.5	0.2	23.27	23.41
MRD	*Measured*	*Discard*	*8.2*	*8.8*	*15.87*	*15.87*
GRAND TOTAL		**-**	**65.37**	**65.8**	**23.26**	**23.03**

Note:
1. GS = Greenside
2. MRD = Mineral Residue Deposit (derived from the No 5, No 4, No 2 and No 1 Seam discard material).
3. CV converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg)
4. Note that the MRD CV has not been considered in the average CV[1].

Although the two estimates appear to be very similar, they are not comparable due to a difference in the seams/sub-seams selected for resource estimation by the Company. This has resulted in an under-estimation by the Company of between 15 and 20 Mt, although it is not possible to reconcile the two estimates. SRK has consulted with the Company’s Resource Geology Specialist; who concurs with this finding.

The differences between the SRK Coal Resource estimates (65.37 Mt) and those of the Company (65.8 Mt) are explained by the following:

- The difference in the seam/sub-seams selection (between 15 and 20 Mt). The Company did not select the full seam when estimating the Coal Resources, but only selected sub-seams; this was done in error and not done intentionally. The impact occurs where a seam is labelled with the full seam name in the model, and not with sub-seam names. For good resource estimation practice, the full seam name should always be included when specifying the seams and sub-seams for estimating the Coal Resources. It should be noted that the sub-seams occur in the identical footprint to the full seam, so there is no change in area, only a change in the vertical thickness of the estimate;

- The exclusion by SRK of certain polygons in the Central Block (approximately 9.0 Mt);
- The downgrading of three polygons in the East Block from Indicated to Inferred Coal Resource category, with a resultant increase in the geological loss of 2.5% (0.4 Mt);
- SRK applied both a minimum and maximum theoretical mining height, which was not applied by the Company (1.90 Mt); and
- Mining between December 2019 and December 2020 (forecast to total 4.65 Mt).

The differences are shown in Table 6-10.

Table 6-10: Tabulation of Differences in the Coal Resource Estimates

Description	SRK Difference (Mt)
Seam/sub-seams selection	+15 to 20
Exclusion of some Central Block polygons	-9.0
Downgrading of resource category with increase in geological loss	-0.4
Application of minimum and maximum theoretical mining heights	-1.90
Mining between December 2019 and December 2020	-4.65

The difference in the estimates is material, but SRK believes that it has been adequately explained in the points above.

7. Rock Engineering

[12.10(h)(vii)] [SR3.1(i), SR4.1(ii), SR4.3(ii), SR5.2(ii)(viii)]

A geotechnical review was carried out on Greenside, including a site visit by SRK's Mr W Joughin on 28 November 2019. The review included all aspects of the geotechnical environment on site from data acquisition, through to geotechnical design and operational controls on design implementation. For the purpose of this review, several data streams and documents were assessed.

7.1. Codes of Practice

The Company has compiled and implemented a Mandatory Code of Practice (**CoP**) to Combat Roof Fall Accidents in Underground Coal Mines for Greenside in accordance with the DMRE's Guideline 16/3/2/1-A4. This is a mandatory CoP in terms of sections 9(2) and 9(3) of the MHSA. It was last updated on 20 May 2019 and is next due for review on 18 April 2022. This is in accordance with the requirements of Anglo American's Operational Management System. In section 7.3 of the CoP, it states that it should be reviewed after every serious incident or if significant changes to procedures, mining layouts, mining methods or equipment and material, which complies with the MHSA and the DMRE Guideline. There are many standards and procedures, which address specific hazards and are linked to the CoP. In general, the CoP complies with the DMRE Guideline.

7.2. Technical Reports

The following documents were reviewed for the purposes of this report:

- Greenside Perform Feeler Gauge Inspection Procedure - v02, Document number AATC024420 (AAC,2017a);
- Greenside Shallow Mining Design Standard - v00, Document number AATC024112 (AAC,2017b);
- Greenside Rock Engineering Reports Sign Off Standard - v00, Document number AATC026295 (AAC,2017c);
- Greenside Ground Control Hazard Plan Standard - v02, Document number AATC013423 (AAC,2018c);
- Greenside Manage Ground Control Hazard Plan Procedure - v02, Document number AATC014183 (AAC,2018d);
- Greenside Mapping of Underground Discontinuities Procedure - v01, Document number AATC020374 (AAC,2018e);
- Greenside Monitoring Standard and Procedure - v00, Document number AATC026536 (AAC,2018f);
- Greenside Underground Strata Defect System Including Outbye Permit To Work Procedure - v02, Document number AATC027857 (AAC,2018g);
- Greenside Mining Dimensions Standard - v02, Document number AATC015956 (AAC,2018h);
- Greenside Perform Safe Barring Procedure - v02, Document number AATC014259 (AAC,2018i);
- Greenside Underground Fences and Barricades Standard - v03, Document number AATC010632 (AAC,2018j);
- Greenside Manage Rock Engineering Input to Production Planning Procedure - v02, Document number AATC014231 (AAC,2018k);
- Greenside Pillar Design Formula Standard - v03, Document number AATC014245 (AAC,2018l);
- Greenside Guidelines to Minimise the Effect on Surface Structures and Topography Standard - v01, Document number AATC015954 (AAC,2018m);
- Greenside Rock Engineering Requirements for Roofbolters Standard - v01, Document number AATC015959 (AAC,2018n);
- Greenside Rock Fall Incident Classification and Reporting Standard - v03, Document number AATC014270 (AAC,2018o);

- Greenside Rock Engineering Audits and Inspections Standard - v02, Document number AATC014269 (AAC,2018p);
- Greenside Mandatory CoP to Combat Roof Fall Accidents in Coal Mines– v05, Document number. AATC010033 (AAC,2019f);
- Greenside Trigger Action Response Plan Classification Standard and Procedure - v00, Document number AATC028295 (AAC,2019g);
- Greenside Water Relieving Hole Standard - v01, Document number AATC019984 (AAC,2019h);
- Greenside Perform Roof Brushing Procedure - v03, Document number AATC014258 (AAC,2019i);
- Greenside Support Standard and Procedure - v09, Document number AATC026522 (AAC,2019j);
- Greenside Manage Sinkholes Standard and Procedure - v00, Document number AATC028476 (AAC,2019k); and
- Greenside Geotechnical Equipment and Material Specification Standard - v01(2019-09-11, Document number AATC027639 (AAC,2019l).

In addition to the CoP, standards and procedures, six rockfall reports (AAC 2017d1 to 2019m4)) and 46 rock engineering reports (2019n1 to 2019n46) were provided and were selectively reviewed for background information.

7.3. The Geotechnical Environment

Greenside is currently mining the No 4 Seam at depths of between 25 m and 100 m. Historically, mining has taken place on the No 1, 2, 4 and 5 Seams. The No 4 Seam has an average thickness of 3.6 m and maximum thickness of 4.1 m. The minimum economic mining height is 1.8 m. Laterally discontinuous carbonaceous siltstones with a maximum thickness of 0.25 m are irregularly distributed within the seam.

The roof lithology comprises carbonaceous shale, siltstone and sandstone, while the floor is predominantly micaceous sandstone with occasional shale laminae. Occasional rolls occur, but the seam is generally flat. Generally, the roof conditions are good, but hazardous conditions may occur when sandstone is less than 0.3 m thick and is overlain by laminated material, the roof coal is less than 0.5 m thick, multiple closely spaced joints occur or burnt coal is present.

The fault is a major northwest-southeast striking feature with a maximum vertical displacement of 30 m, which divides the mine into two distinct domains. A smaller sub-parallel fault occurs to the west. There are numerous steeply dipping dolerite dykes oriented roughly northeast – southwest. Bracket pillars have been left adjacent to these major geological structures.

Downward transmission of groundwater through the rock mass is limited by horizontally bedded sediments, which act as aquicludes. However, small quantities of groundwater reach the No 4 Seam roof through sub vertical geological structures.

Guttering may occur when adverse stress conditions are encountered.

There are several standards and procedures, which deal with the identification and management of geotechnical hazards.

Greenside requires the preparation of a Ground Control Hazard Plan (**GCHP**) to identify and demarcate hazardous areas; this provides mine personnel with a pro-active warning of the possible need for additional support, controls or strategies. This is based on geotechnical logging and impact splitting of drill hole core in the immediate roof (2.0 m) and geological mapping (at least once per week in each section). Potentially hazardous roof conditions and geological features are displayed on the GCHP.

Greenside has developed a Trigger Action Response Plan (**TARP**) (AAC, 2019g) for personnel to identify geotechnical hazards and to assign responsibilities for actions to deal with the hazards. The CM Operator, Bolter Operator and Face boss have primary responsibility for identifying hazards, with oversight by the Shift boss. Green triggers are dealt with by the operators and Orange triggers must be reported to the Face boss and Shift boss for further action. Red hazards must be barricaded off and require the intervention of a Red Response Team (**RRT**), comprising the Mine Overseer, Section Manager and a member of the rock engineering department. The Section Manager and Mine Manager must ensure that all actions are closed out. The TARP addresses each geotechnical hazard and photographs are used to assist with identification of the hazards. Specific actions are required for each hazard. There is a TARP system standard for production sections and outbye areas. It caters for bord and pillar mining with CMs and development by drill and blast methods in stone.

Roof Monitoring Devices (**RMD**) must be installed in the intersections of all belt roads and travelling roads and whenever hazards, such as geological structures, guttering and excessive water are identified as part of the TARP. The RMDs provide early warning of strata movement. The TARP may also indicate the requirement for feeler gauge inspections to enable the identification of delamination. When excessive water is indicated by the TARP, four-metre-long holes must be drilled to allow drainage and to prevent a build-up in pressure along a parting plane, which could trigger a rockfall. In shallow mining areas (<25 m depth), RMDs must be installed and water relieving holes must be drilled in every intersection.

The section visit reports by the rock engineering services indicate that compliance to the TARP system is generally good. In a few cases, the TARP guidelines were not properly observed, requiring an intervention from the rock engineering services. This is managed through the close out for these reports.

7.4. Underground Rock Engineering Design

[SR5.2(vi)]

The CoP stipulates the design parameters for mining dimensions, pillar dimensions, support patterns and guidelines for mining at shallow depth and prevention of subsidence. More detail is then provided in specific standards and procedures to address all these aspects.

In good ground conditions the maximum bord width is 7.2 m, intersection span (diagonal) is 11.5 m and cutting distance is 12 m. These dimensions have been determined from experience and are typical for South African coal mines with good roofs. Under certain conditions, the rock engineer may approve cutting distances of up to 16 m, but this is reviewed every 30 days. Where poor roof conditions are encountered, the bord width must be reduced to 6.5 m. The cutting distance may also be reduced in poor roof conditions and the rock engineer may dictate shorter cutting distances. Where the bord width or intersection span exceeds the maximum dimensions, longer support is required. If the maximum dimension is exceeded by more than two metres, then the area must be barricaded off and the rock engineering department must be consulted. This is also included in the TARP.

Greenside has included recent South African pillar research in their approach to design. The pillar formulae have been derived from data on pillar collapses, which was updated in 2012 by van der Merwe and Mathey (2013a, 2013b and 2013c). Corrections for different pillar shapes have been implemented. Both factor of safety and probability of failure are used for determining pillar sizes for different depths. Importantly, the routine monitoring and TARP systems, which have been implemented, aid in the identification of pillar damage and deviations from the design.

For good roof conditions, the bolt length is 1.8 m, with four bolts per row and a row spacing of 1.5 m. For hazardous roof conditions, the row spacing is reduced to 1.0 m. Standard support patterns for geological features and guttering, including ribside support are provided. Mesh, Osro straps and nets are used for areal support as required. The bolts are full column grouted resin bolts (20 mm diameter, ultimate tensile strength 552 MPa). Longer bolts (2.2 m long) and cable anchors (4.0 m cable anchors) are also specified. Detailed installed procedures and support specifications are provided, which are appropriate. Four support design reports were reviewed, which demonstrate that both shear and deadweight loading are tested, and appropriate factors of safety are applied. Additional support is to be installed when triggered by the TARP system. The 46 section visit reports by the rock engineering services indicate that compliance to support standards is generally good. The few exceptions are addressed through the close out process for each report.

Greenside has historical subsidence on its property. All current mining is done in accordance with its comprehensive guidelines for shallow mining, minimising the impact on surface structures and topography. Minimum pillar factors of safety are specified for the protection of surface structures, which are based on subsidence literature. There is also a procedure for managing the risk of sinkholes from pre-existing mining, which is based on internal research carried out by the Company, which provides sensible, pragmatic guidelines. The three undermining reports demonstrate that the guidelines ae being followed.

Rock engineering input is incorporated into long, medium- and short-term planning. Reconciliation of the mining layout (pillar dimensions, bord widths and intersection widths) is carried out after surveys and any deviations are noted and actioned. Subsidence protection is addressed in all phases of planning.

7.5. Observations During Site Visit

[SR5.2(vi)]

The underground visit to Thandeka Section revealed generally very good roof conditions. Operational discipline appeared to be good with neatly cut roof and pillars. A neat pattern of support was observed. There were very few areas with hazardous conditions that required extra support. The system for reconciliation of the mining layout dimensions was reviewed during the visit and found to be effective.

7.6. Specific Geotechnical Risks

[12.10(h)(x)

The risk of injuring personnel appears to be well managed. It was reported that the last rock-related fatal injury was in 2013. According to the CoP, no lost time injuries have occurred since 2014 and very few minor injuries have occurred. Six rockfall incident reports were provided dating from 2017 to 2019. These typically occur when geotechnical hazards are not properly identified, and TARP procedures are not followed. This is addressed through training at the scene of the incident and in planning.

Surface infrastructure, including major roads, powerlines and buildings, as well as water bodies need to be protected. The procedures address the subsidence risk, and this is managed through input by rock engineering and survey into planning meetings.

Damage to equipment and production delays can occur due to rockfalls. One of the rockfall incidents reports included damaged to a vehicle. Inspections of outbye areas are carried out and hazards are addressed. There are suitable procedures for the safe retrieval of trapped CMs.

7.7. Conclusions

Greenside has comprehensive procedures in place for managing rock engineering risks. The roof conditions are generally very good and operational discipline and compliance appear to be satisfactory. The TARP system is generally effective and hazardous conditions appear to be identified and addressed. There are a few exceptions, but these are addressed through the systems. As a result, there are very few rockfall incidents and no lost time injuries related to rockfalls have occurred since 2014.

The pillar design is based on updated research and the surveyed pillars and bord widths are reconciled each month to ensure compliance. Subsidence protection and undermining of surface structures appear to be well managed.

8. Mining

[12.10(h)(ix)] [SR4.3(ii), SR5.2, SR6.1(ii)]

A review of the mining operations was carried out by Mr N McGeorge of SRK, including a site visit on 28 November 2019. This included discussions with mine personnel, data review and visiting the underground workings.

8.1. Introduction

[SR5.2(i)(v), SR6.1(ii)]

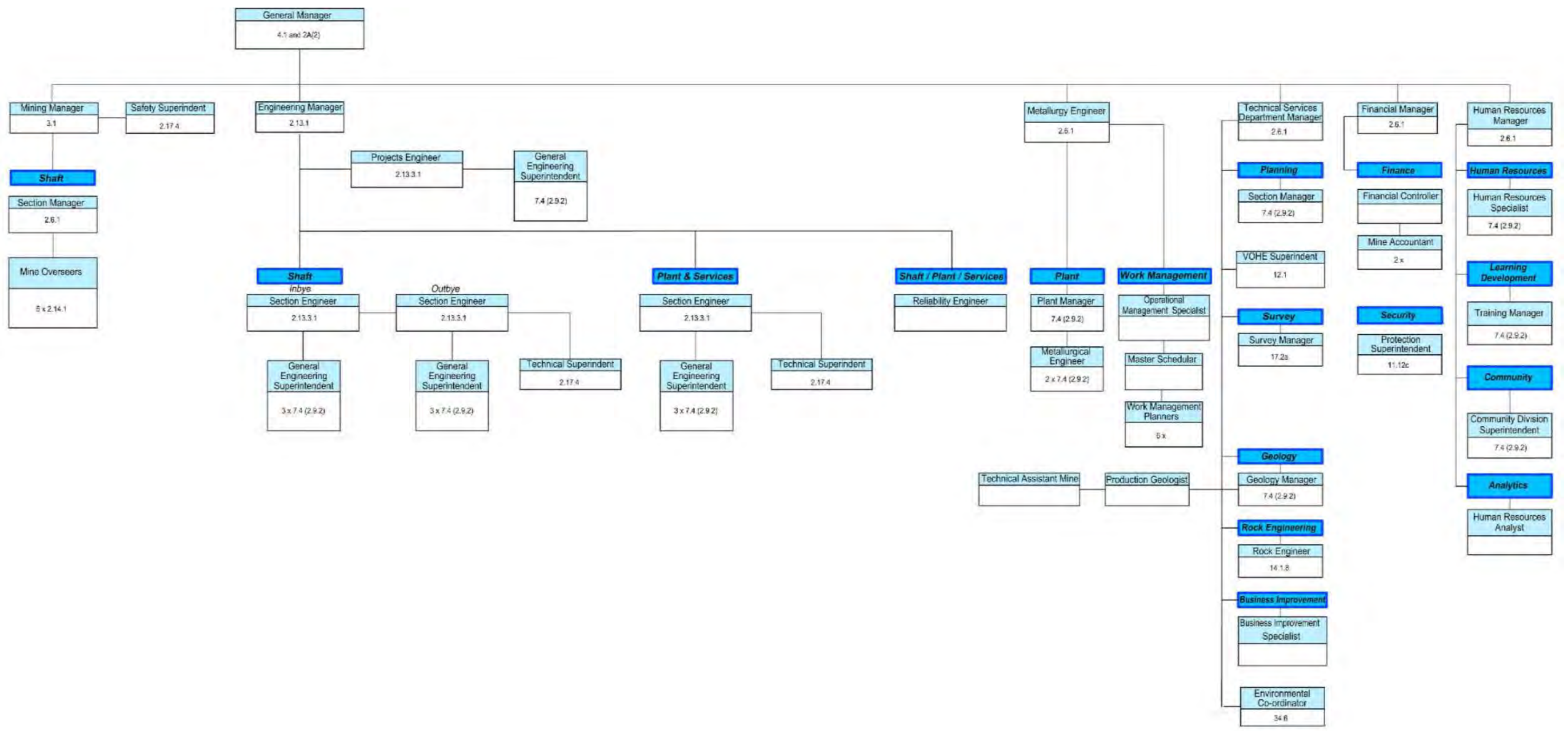
Greenside is an underground colliery using mechanised bord and pillar mining to exploit the coal within the GAR. There are five CM sections, all currently in the northwestern part of the mine. The three coal preparation plants produce an export-grade product that is sold through the RBCT. A domestic product is derived from recovering MRD material and blending it with some of the primary product discard material; this is sold into the domestic market via third parties.

The main target seam is the No 4 Seam as the No 5, No 2 and No 1 Seams were mined previously. Pillar coal remains and may be considered a resource in the future, provided suitable studies are conducted to demonstrate viability. Future mining will move to the southeast into East Block, where the coal is of somewhat lower quality and reduced thickness.

8.2. Colliery Organisation

[SR5.2(viii)] [ESG4.1]

The mine is organised into a mining division, an engineering division, the coal preparation plant and logistics, and the technical services, financial and administrative functions. These divisions report to a General Manager who oversees the respective divisions and undertakes the legal responsibilities of Owner's Representative as required by the Mine Health and Safety regulations. The other legal responsibilities are covered by the respective heads in the divisions; for example, Mine Manager, Engineering Manager, etc. All the activities on the mine are underground and hence the respective fiery mine regulations apply. The GAR is the boundary of the colliery's legal responsibility - this covers several mining licences as described in Section 2.4.1 and Figure 3-1.



srk consulting

GREENSIDE COLLIERY CPR
Management Organogram

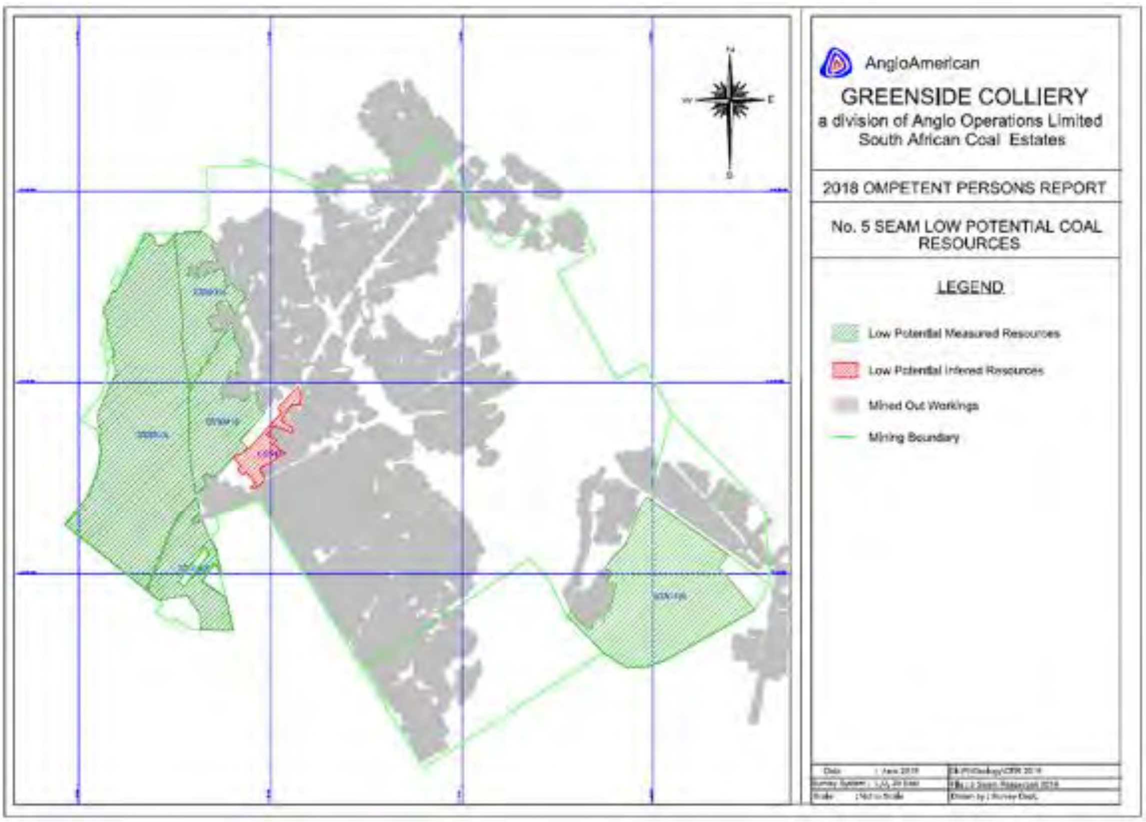
Project No.
566644

Figure 8-1: Greenside Colliery Management Organogram

8.3. Mine Design and Scheduling

[SR4.2(iv), SR4.3(ii), SR5.2(i)(ii)(iv)(v)(vi)(viii)(ix)]

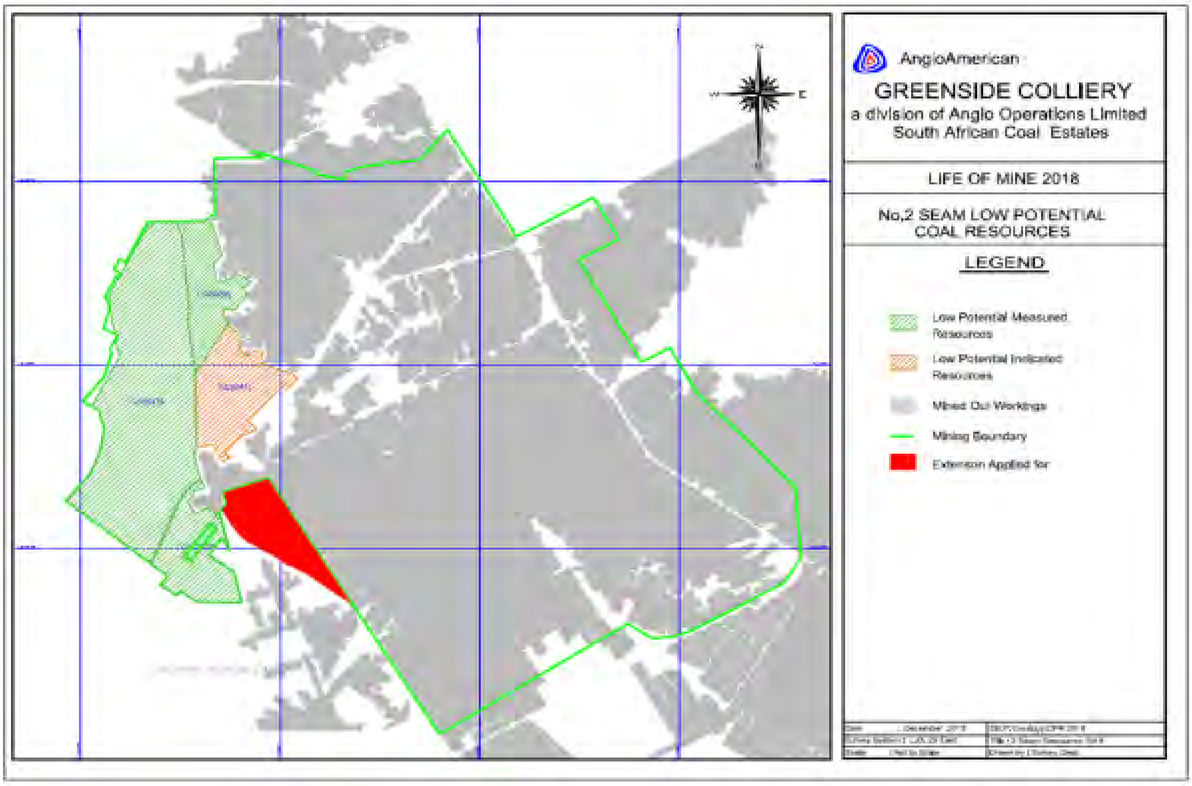
The mined out areas and remaining Coal Resources of the No 5 Seam and the No 2 Seam are illustrated in Figure 8-2 and Figure 8-3, respectively. Figure 8-3 clearly illustrates that the No 2 Seam is not the basis of the mine plan and that the plan is a function of the No 4 Seam resource. The remaining coal is restricted to the western portion of the property where it is classified internally by the Company as “Low Potential”, due to the high frequency of geological features and mined out areas. Note that “Low Potential” is not a recognised SAMREC Code 2016 category and is not included in the estimates in this CPR.



GREENSIDE COLLIERY CPR
No 5 Seam Mined Out Area
(Source: Greenside LoM Report, 2019 - AAC, 2019p)
Project No. 566644

Figure 8-2: No 5 Seam Mined Out Area

The area marked in red in Figure 8-3 indicates the coal swap made with Glencore, termed the Waterpan North Block. The No 2 Seam in this block occurs at one of the lowest points in the Witbank Coalfield for the No 2 Seam and any exploitation of the seam in this block is likely to be prone to unusually high water ingress from the surrounding flooded workings. Access to this area of the seam will not be possible from existing No 2 Seam workings without prior removal of the water; therefore, some form of a decline would be required from the No 4 Seam to isolate the block. There is thus no clear plan for exploitation as the block is small, the resources are limited, and the risks pertaining to extraction are elevated.



srk consulting	**GREENSIDE COLLIERY CPR** No 2 Seam Mined Out Area *(Source: Greenside LoM Report, 2019 - AAC, 2019p)*	Project No. 566644

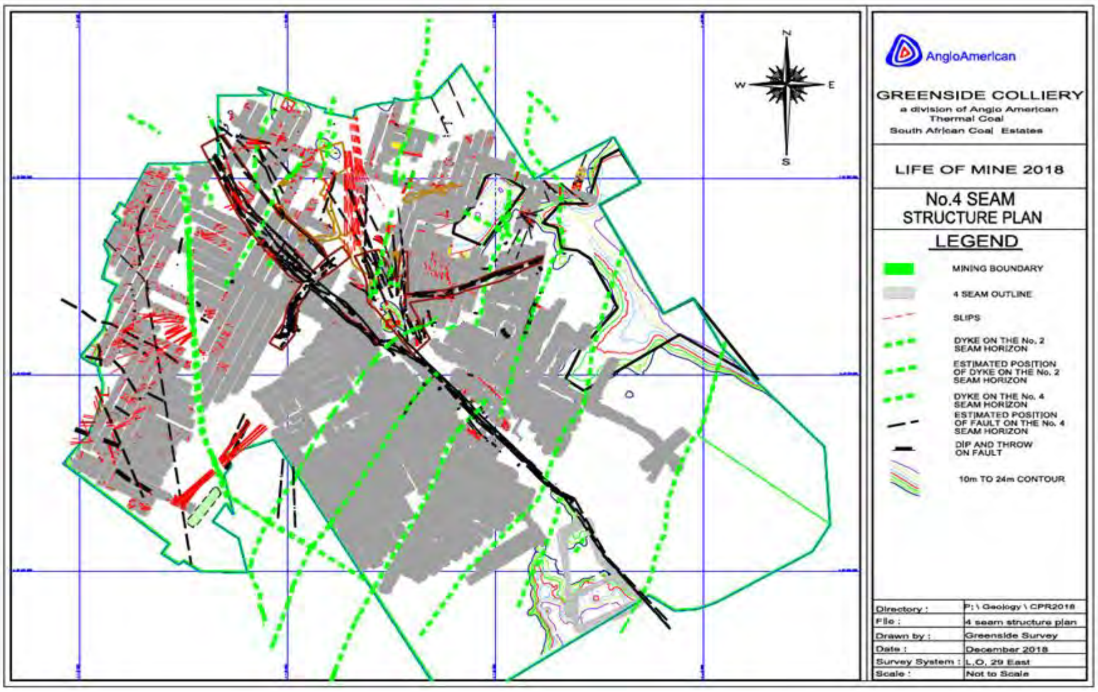
Figure 8-3: No 2 Seam Mined Out Area

The geological characteristics of the No 4 Seam are identified generically, as illustrated in the lithological log in Figure 8-4. The seam – excluding the No 4 Upper and No 4 A sub-seams - is split into the No 4 Seam Select horizon (S4S) and the balance into the No 4 Seam Top (S4T) horizon. This is done using the proprietary Gradecon software, which recombines the selected sampled plies from the geological sampling and estimates the select mining height (S4M) to maximise the sales yield, depending on the product to be produced. The target product is export grade thermal coal (5 400 kcal/kg and higher). Gradecon also applies the mining equipment constraints to limit the selected mining horizon accordingly. The resultant mining horizon then forms the basis of where mining panels can be laid out and which coal will be scheduled to simulate the LoM plan. It also gives an indication as to what the geotechnical parameters are likely to be in the roof so as to indicate the potential contamination and the required roof support regime. The discounts for the geological classification and the contamination are also applied in Gradecon to yield the final selected mining horizon.

Figure 8-5 illustrates the mined-out area for No 4 Seam as of 2019. The mining panels have been laid out over those areas that fit within the minimum mining height constraints and other geological features (dykes, faults), illustrated in Figure 8-5, Figure 8-6 and Figure 8-7. The reserve areas are separated by these geological features, as well as the pillars required to undermine the N12 and R555 roads. They are accessed through primary development and secondary panels to minimise the need to traverse the geological features. Figure 8-8 illustrates all the mined-out seams to demonstrate that the remaining panels in the No 4 Seam will have some spatial relationship with other seams in the geological sequence.

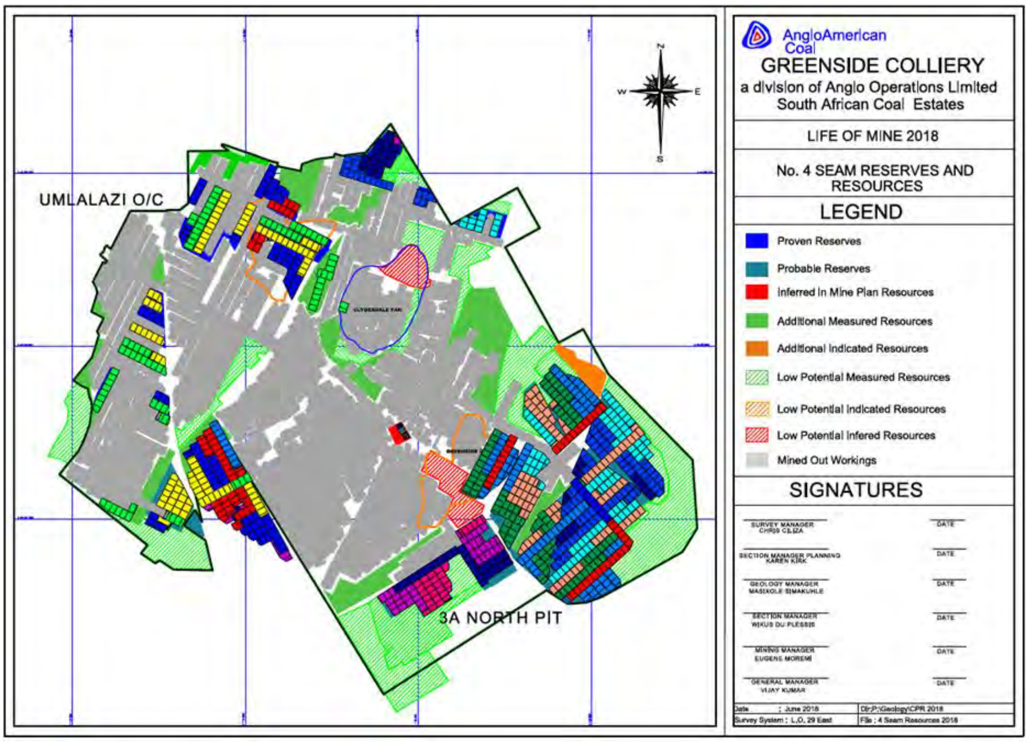
srk consulting	GREENSIDE COLLIERY CPR No 4 Seam Mining Horizon Selection	Project No. 566644

Figure 8-4: No 4 Seam Mining Horizon Selection



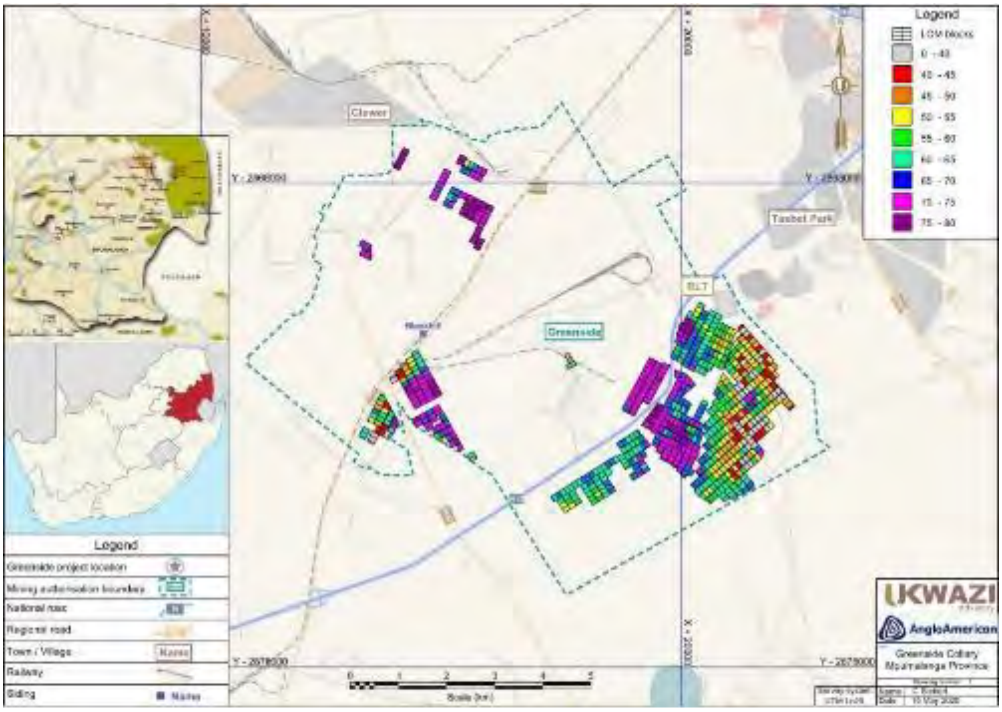
srk consulting	GREENSIDE COLLIERY CPR No 4 Seam Geological Structures *(Source: Greenside CPR, 2019 - AAC, 2019b)*	Project No. 566644

Figure 8-5: No 4 Seam Geological Structures



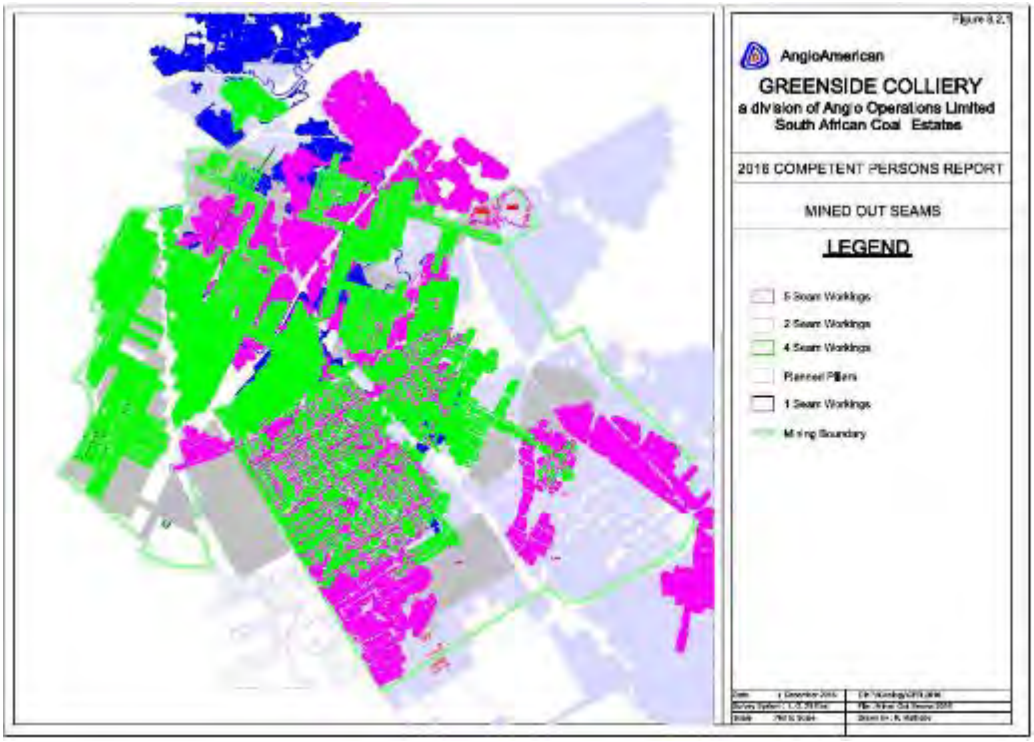
srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Mining Horizon Selection Panel Layout 2018 *(Source: AAC, 2019ad)*	Project No. 566644

Figure 8-6: No 4 Seam Mining Horizon Selection Panel Layout 2018



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Primary Yield for 5850 kcal Sales Product Illustrating No 4 Seam Panel Layout as per 2020 XPAC Model *(Source: Ukwazi, 2020)*	Project No. 566644

Figure 8-7: No 4 Seam Primary Yield for 5 850 kcal/kg Sales Product, illustrating No 4 Seam Panel Layout as per 2020 XPAC Model



srk consulting	**GREENSIDE COLLIERY CPR** All Previously Mined Seams *(Source: AAC, 2019ad)*	Project No. 566644

Figure 8-8: All Previously Mined Seams

8.3.1. Underground Panel Design Parameters

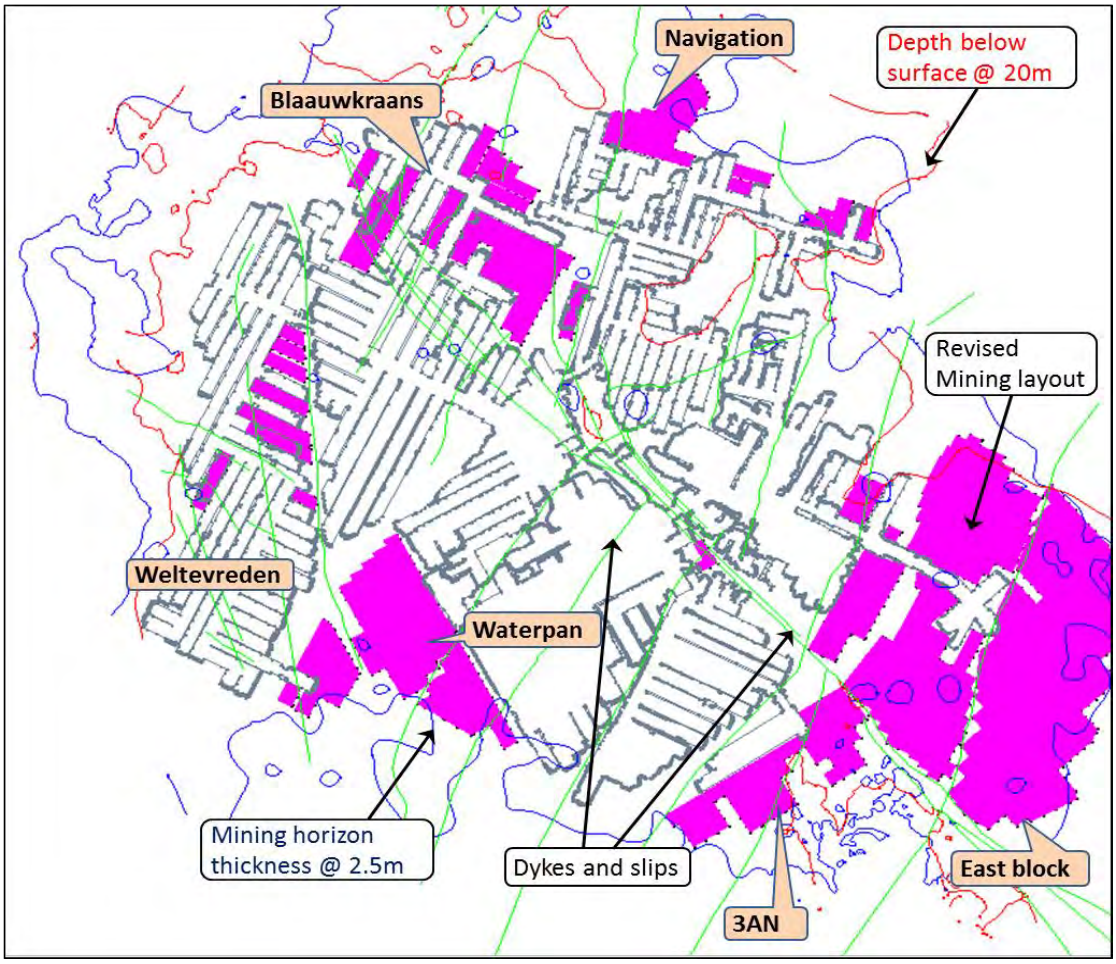
SR6.1(iii)

The first cut-off parameter used is a minimum mining height of 2.5 m, governed by the restriction on the mining equipment (CMs). The minimum roof depth cut off is set at 20 m to surface to avoid potential weathering of the coal seam. As can be seen in Figure 8-9, there are some areas in the southeast that approach this limit; thus a good proportion of the coal can be classed as falling under the shallow mining guidelines (refer to Section 7.2).

From the main developments, the mining panels are laid out in consideration of the geotechnical and geological conditions. The ultimate extent of mining is determined with reference to the margin ranking results; only portions that constitute positive margins are included in the mining areas. There are exceptions where isolated blocks of no value occur within zones of positive margins. These blocks are included into the mining layout and ultimately, are scheduled in the mining sequence to enable access to positive margin areas. This is discussed further under Section 9.2.

The following general criteria were used to design the layouts:

- Primary developments: 9 - 10 roads per panel;
- Secondary developments: 9 - 10 roads per panel;
- 15 to 16 m centres for square bord and pillar sections– depending on safety factors and width-to-height ratios, a minimum 16 m centre is used. This suits the advance of the CM in terms of cutting depth without support and minimises the amount of tramming required in the section. At this minimum of 16 m, the extraction ratio is 70% but when the safety factor (**SF**) is estimated, it exceeds the 1.6 SF design criteria. Smaller pillars have been used elsewhere in the coalfield, which has led to subsidence in many of the shallow workings;
- Deeper areas are designed to maintain the required 1.6 SF, and thus have bigger centres and reduced roadways per panel; and
- Road widths of 7.2 m.



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Mining Horizon: Revised Mining Layout showing Mining Limits at 2.5 m Mining Height and Minimum 20 m Depth below Surface Cut-Off	Project No. 566644

Figure 8-9: No 4 Seam Mining Horizon: Revised Mining Layout showing Mining Limits at 2.5 m Mining Height and Minimum 20 m Depth below Surface Cut-Off

With the relatively small pillar sizes, panels can be nine to ten roads wide as CM and shuttle car cables are 200 m in length and will reach up until a three-pillar belt extension is required. Generally, two- pillar belt extensions are used and planned for. For main developments with smaller pillar centres, ten road panels are considered. This allows more flexibility when a trunk belt needs to be installed while the section is mining on the current section belt; it also provides more space for the initial drive and belt installation of the secondary side panels.

In-panel pillars constitute primary support for the mining panels and these pillars are designed to comply with the following parameters:

- Primary developments: pillars with SF of more than 2.0;
- Secondary developments: pillars with SF more than 1.6;
- Production panels: pillars with SF more than 1.6;
- Minimum width-to-height ratio of 2.0 for depths below surface greater than 40 m (less than 40 m is considered shallow mining);
- Minimum width to height ratio of 2.2 for depth below surface less than 40 m; and
- Barrier pillars between panels to be the same width or wider than the largest dimension of the in-panel pillar.

Where the overburden thickness of the panel is less than 40 m, the following guidelines must be adhered to:

- Minimum width-to-height ratio of 2.2;
- Minimum safety factor of 2.1;
- Minimum pillar width of 6.5 m; and
- Percentage extraction less than 75%.

There are some surface features, such as the N12 and R555 roads, that must be protected.

The interburden thickness between the No 5 Seam workings and the No 4 Seam shows a thickness of over 12 m; between the No 4 Seam and the No 2 Seam workings the interburden is greater than 16 m. There is thus no need to superimpose the mining layouts over the existing mined out areas.

8.4. Mining Fleet and Machinery

[SR5.2(viii)]

The underground mining fleet is designed in five operating CM sections and an additional sixth section used as a training section employing drill and blast methodology at very limited capacity. The five sections are allocated equipment as shown in Figure 8-10 and supported with shuttle cars to clear the coal from the CM to the conveyor belt, which is equipped with a feeder breaker. The machine specifications are listed in Table 8-1. The roof support is done with Fletcher roofbolters and the auxiliary equipment of front-end loaders, personnel carriers, stonedust machines, etc. is sufficient to ensure minimal delays in cutting time. The Thandeka Section has been equipped with an additional CM, shuttle car and bolter to increase the available cutting time and minimise tramming delays. This "super section" has a few additional staff to prepare the machine while it is not cutting and has had significant impact on the productivity of the mining section. For the LoM plan, this practice will be continued in this section.

Section	Conveyance	CM
Thandeka	3 x 20 T Shuttle cars	Joy HM31
Vumagara	3 x 20T Shuttle cars	Sandvik MC470
George	3 x 20T Shuttle cars	Joy HM37
Thusanang	3 x 20T Shuttle cars	Sandvik MC470
Shosholoza	3 x 20T Shuttle cars	Joy HM31

srk consulting | **GREENSIDE COLLIERY CPR** Underground Mining Fleet *(Source: AAC, 2019ac)* | Project No. 566644

Figure 8-10: Underground Mining Fleet

Table 8-1: Mine Equipment Specifications

Description	Continuous Miner HM31 (Mega Head Cutter)	Continuous Miner HM37 (Mega Head Cutter)	Continuous Miner MC470	Shuttle Car (VFD drive, latest dual conveyor drive)	Roof Bolter (DDR)
Negotiated Angles	≥ 90°	≥ 90°	≥ 90°	≥ 90°	≥ 90°
Turning Circles				7.56 m	
Tramming Height	2.5 m minimum	2.15 m minimum	2.8 m minimum	2.77 m - loaded 2.32 m - empty	2.4 m minimum tramming height
Reach (cutting height)	4.8 m maximum	5.1 m maximum	5.0 m maximum	N/A	4.9 m maximum drill height
Civil Requirements Maintenance Bays	Maintenance Bay UG	Maintenance Bay UG	Maintenance Bay UG	Maintenance Bay UG	Maintenance Bay UG
Communication to Control Room	Fibre Optic from Sect. TX to Control	Fibre Optic from Sect. TX to Control	Copper/Fibre Optic from Sect. TX to Control		
Electrical Reticulation	3.3 kV @ 430 A or 1000 V @ 1220 A	3.3 kV @ 430A or 1000V @ 1220A	930 kW / 3.3 kV	1000V @ 285A	1000V @ 114A
Installed Power	3.3 kV = 936 kW 950V = 756 kW	3.3 kV = 936 kW 950 V = 756 kW	930 kW/3.3 kV	950 V, 243 kW	1000 V, 74 kW
Water Requirements	120 l/min @ 10-15 bar	120 l/min @ 10-15 bar	Minimum 136 l/min @ 10 bar		

Notes:
1. UG – Underground
2. l/min – litres per minute

The mine has agreements with the equipment manufacturer for the service and maintenance of the equipment, which is planned and scheduled through the Ellipse Maintenance System on the mine. The mine is supported by a stonework crew that operates as required in developing through dykes and for work in ventilation crossings, etc. There is adequate support equipment for stonedusting, ventilation and service requirements and the conveyor belts are not a constraint in the infrastructure design. The maintenance agreements as well as the close attention to the conveyor belts ensures a high degree of availability and utilization of the mine equipment. This is discussed further in the mine equipment productivity under the LoM plan (Section 8.8).

8.5. Ventilation and Cooling

This section evaluates the effectiveness of risk control measures with emphasis on workplace ventilation design. These are aimed at minimizing all occupational hygiene exposures to below Occupational Exposure Limits (**OELs**), as contemplated in all mandatory codes of practices and Regulation 9.2 of the MHSA.

The following methodology was applied:

- Ventilation designs to provide ventilation and cooling for the long-term business plan;
- Mine production plan aligned with ventilation and cooling supply;
- Emergency preparedness/second outlets;
- Flammable gas management;
- Prevention of mine fires;
- Critical spares; and
- Capital requirements.

The Company can be classified as a shallow depth coal mine (< 200 m below surface), where the design indicates ventilation with no cooling is required for production.

8.5.1. Determining Ventilation Quantities

The overall airflow quantities should be assessed in terms of airflow provision for diesel emission dilution, provision of sufficient ventilation to maintain air speeds above 1.0 m/s (mine standard) in the last through roads, clearance of blasting fumes (if applicable) and provision of a ventilation rate per 1 000 tpm, whichever the greatest.

Current Ventilation System

The total air quantity requirement was dominated by the air quantity required to provide air speeds in all last through roads >1 .0 m/s. The minimum air speed is required to prevent a build-up of flammable gas (methane, CH_4). At peak production from six production sections, a total quantity of 890 m^3/s including allowance for other commitments (workshops, etc.) and leakage is available for the mine. The ventilation quantity is sufficient to provide > 1.0 m/s in the last through roads.

Life of Mine Plans

The LoM schedule prioritizes the access to the reserves in the Eastern Section. When production moves to the Eastern Section, the existing ventilation infrastructure will not be able to supply the required ventilation quantities for future mining (2020 to 2028). A brief description of the provisional plan to provide the required ventilation and improve efficiencies is as follows:

- Provide a new 4.5 mØ up-cast shaft in the future East Block; and
- Provide a new 4.5 mØ downcast in the East Block.

The ventilation and cooling designs are outlined in Table 8-2.

SRK Comments

- Current air speeds in through roads at all the mining sections were above the minimum requirement of 1.0 m/s;
- The high-risk flammable gas (methane) was within the OELs; and
- The LoM plans show the workings can be adequately ventilated.

Table 8-2: Greenside Ventilation Designs for the Current and LoM Projects

Category	Current Status	LoM (2021 to 2028)
Ventilation		
Mining method	Board and pillar	Board and pillar
Mining depth	<200 m	<200 m
Rock temperature	<25.0 °C	<25.0 °C
Design air speeds in last through roads	>1.0 m/s	>1.5 m/s
Available ventilation quantity provided by main fans	890 m³/s	±700 m³/s
Leakage allowance	20%	20%
Actual leakage	Not indicated	N.A.
Average air speeds in last through roads	> 1.0 m/s	> 1.50 m/s (planned)
Intake Airways		
No. 3 Shaft	Dimensions not provided	
Incline Daylight Shaft	7.5 m x 3.6 m	7.5 m x 3.6 m
Incline 6 Shaft ROM	6.0 m x 2.4 m	6.0 m x 2.4 m
Incline 5 Shaft Workshop	6.3 m x 3.0 m	6.3 m x 3.0 m
NW5 Vent Shaft	4.5 mØ	4.5 mØ
New Vertical Downcast Shaft		4.5 mØ
Village Black Downcast Shaft		4.5 mØ
Return Airways		
Black Hill Up-cast Shaft	4.5 mØ	
12 Shaft Up-cast	5.5 mØ	
Thandeka Up-cast Shaft	4.5 mØ	
New Vertical Up-cast Shaft	-	4.5 mØ
Main Fans		
Black Hill Fan station	2 out of 3 fans operating. Q: 270 m³/s	
Thandeka Fan station	2 out of 3 fans operating. Q: 470 m³/s	
12 Shaft Fan station	1 out of 2 fans operating. Q: 150 m³/s	
New Vertical Up-cast Shaft	-	Various fan combinations to operate between 2021 and 2028
Cooling		
Total cooling required	Not required	Not required
Critical Spares		
Main fans	One spare main fan at each fan station	One spare main fan at each fan station.
LoM Capital Requirements		2 x 4.5 mØ R/B holes and fan relocations Estimated cost: ZAR20m

8.5.2. Flammable Gas and Coal Dust Explosion Management

Flammable gas (methane) and coal dust explosions are one of the principle hazards in underground coal mines. A set amount of flammable gas (Methane) is released in each production section. However, due to the relatively low release rate, flammable gas levels are negligible. Methane content in the last through road returns is less than 0.5%. The OEL in South African mines is 1.4%. Explosive range for Methane: 4.5 to 17%.

The controls include the following:

- Provision of sufficient ventilation to maintain air speeds in the last through roads above the critical minimum velocity of 1.0 m/s:
- A comprehensive mandatory flammable gas and coal dust explosion CoP;
- A primary control against the Coal dust explosion hazard is the application of stone dust (limestone) throughout the mine;
- Continues electronic monitoring devices are installed throughout the mine and in in all through roads. The following is monitored:
  - Air speed;

- Methane (CH_4); and
- Smoke/carbon monoxide (CO).

Fire Prevention

Underground mine fires are also one of the principle hazards in underground mines. The controls include a comprehensive Mandatory Fire Prevention CoP. In addition to the CoP, the mine complies with the detailed Company fire prevention procedures.

Emergency Preparedness and Response

The procedures comply with a comprehensive Mandatory Emergency Preparedness and CoP. The mine is well-placed to handle emergencies.

Risks

Flammable gas, coal dust explosions and mine fires.

8.6. Manpower Requirements

[SR1.1(ii)] [SR5.2(viii)]

The mine undertakes the production functions itself for both the underground operations as well as the beneficiation plant. It also controls the maintenance functions, apart from what is done by the equipment manufacturers under agreement. The administration and mine management and planning are also undertaken by the mine. Secondary services such as cleaning, security, etc. are undertaken by contractors. At present, the mine has 773 direct employees and 566 contractors. This number has remained reasonably consistent over the past three years. Table 8-2 shows the historical manpower requirements.

Table 8-2: Greenside Historical Manpower Requirements

Year	2017	2018	2019	2020
Employees	751	720	773	759
Contractors	453	487	566	566
RoM produced (kt)	4 701	5 063	4 920	4 652

Note:
1. The figures for 2020 are based on actual data for January – August and forecast estimates for September – December.

8.6.1. Legal Appointments

The mine is classed as a fiery mine and requires the appropriate legal appointments under the MHSA, the MRPDA and the Explosives Act (Act No 15 of 2003).The mine is organised around these mandatory appointments with subordinate appointments as required. The area of responsibility for the legal appointments covers three mining licence areas (Figure 3-1). There are some surface areas that are specifically excluded due to the nature of the activities undertaken, for example, the EWRP area.

8.7. Mining Costs

[SR4.3(vii), SR5.2(ii), SR5.6(iii)(ix)]

The forecasted costs by SRK for the 2021 financial year are shown in Table 8-3.

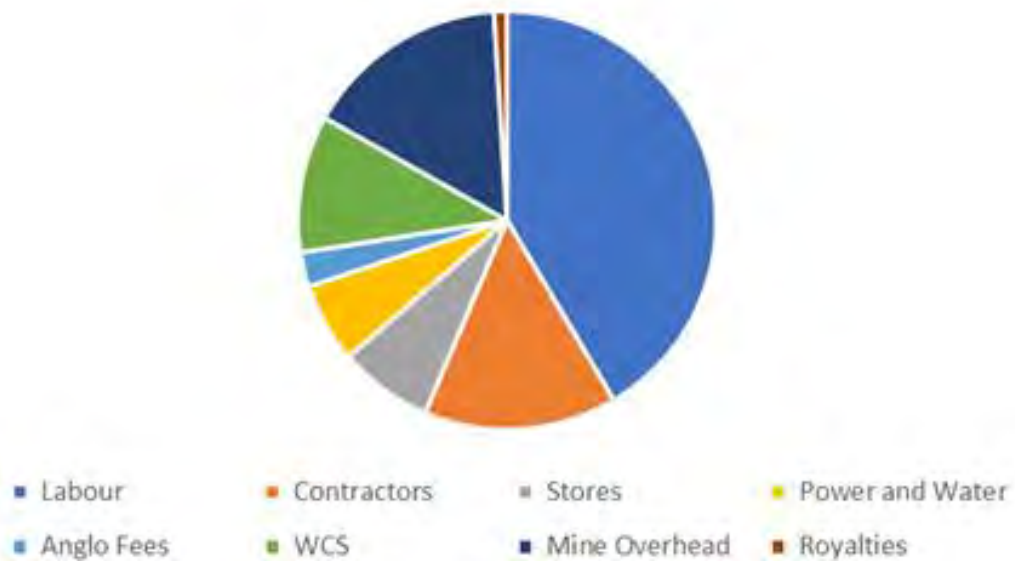
Table 8-3: Forecast Costs for 2021

Description	Unit	2021
RoM Tonnes	(Mt)	5.15
Sales Tonnes - Exports	(Mt)	3.92
Sales Tonnes - MRD	(Mt)	1.1
Labour	(ZARM)	**686**
Stores/Materials	(ZARM)	**131**
Contractors	(ZARM)	**147**
Working Cost Suspense	(ZARM)	**271**
Company Reimbursables	(ZARM)	**44**
Processing	(ZARM)	**39**
Services	(ZARM)	**373**
Total Cash Cost (excluding Selling Costs) FoR	**(ZARM)**	**1.691**
Total Selling Expenses (ZAR215/Sales tonne) FoR	**(ZARM)**	**893**
Marketing fees, Royalties, Carbon Tax	**(ZARM)**	**203**
Total Cash Cost FoB	**(ZARM)**	**2.787**

The mine costs are estimated from the Business Plan 2020 (AAC, 2020d) and adjusted where necessary for the changed volumes (AAC, 2019o). The mine has a high proportion of fixed costs and hence is not sensitive to the volumes produced. The cost model has included the necessary charges to the Company. The breakdown of the Free on Rail (**FoR**) costs is shown in Table 8-4.

Table 8-4: Unit Costs Free on Rail (ZAR/t)

Description	2021 Costs FoR (ZAR/RoM)
Labour	133
Stores/Materials	25
Contractors	29
Working Cost Suspense	53
Company Reimbursables	9
Processing	8
Services	72
Total R/RoM	**329**

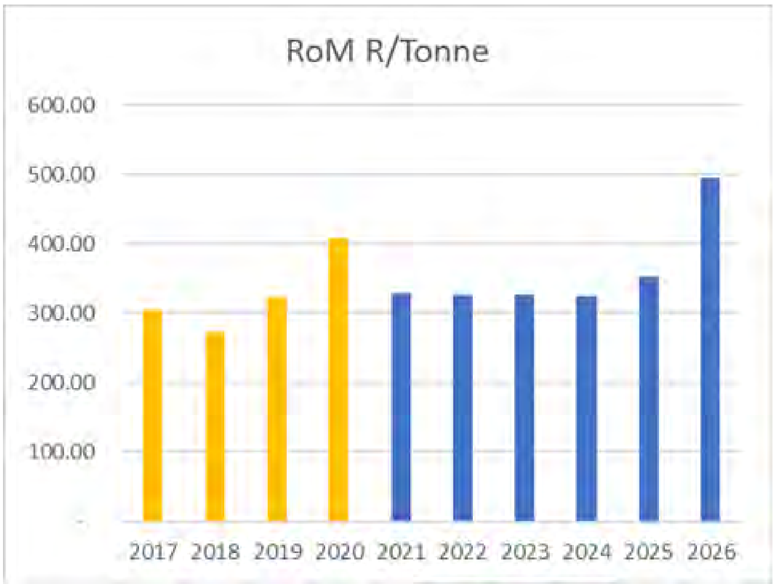


srk consulting	**GREENSIDE COLLIERY CPR** FoR Unit Cost – Base Date December 2020	Project No. 566644

Figure 8-11: FoR Unit Cost - Base Date December 2020

An analysis of the historical trends of the costs is shown in Figure 8-12 with the 2017 to 2019 cost in money of the day and the 2020 forecasts in real terms base date December 2020. This shows the history of some costs increasing at faster rates than inflation, particularly power and some maintenance costs. It is expected that these trends may affect some of the costs beyond 2020 but there have been extensive interventions at the mine to restrict the cost escalations. For example, the introduction of the "super section", which will increase throughput for limited cost increment by using two continuous miners in the section. The other main cost at Greenside are the selling and distribution costs, which are estimated at ZAR189 per sales tonne for rail costs and ZAR29 per sales tonne for Richards Bay Port costs.

In the cost model, additional costs or retrenchments and mine closure costs are not simulated but are included in the TEM. It is expected that there is a period in the mine schedule where the sales yield is expected to drop and hence will affect the unit cost per sales tonne. The other major trend is the gradual tendency of the reducing mining height in the No 4 Seam; this has been accounted for in the productivity in the mining model simulation.



srk consulting	**GREENSIDE COLLIERY CPR** RoM Unit Cost: History and LoM (ZAR/t)	Project No. 566644

Figure 8-12: RoM Unit Cost: History and LoM (ZAR/t)

The other key mining costs are:

- The capital required for the ongoing major maintenance of the mining equipment; and
- The necessary cost for the construction of the trunk conveyors servicing the mining areas.

These have been estimated from the existing budget and then scaled according to the historical expenditure and the reduced maintenance cycles (due to potential mine closure in 2025). This money also incorporates any expenditure necessary to adapt the existing mining fleet to mine in areas of lower mining height.

Stay in Business capital (**SIB**) is shown in Table 8-5; as illustrated, SIB reduces towards the end of the mine life, targeted as 2025. Included in this capital plan is the necessary conveyors, etc. for the development into the mining panels in the southeast of the property.

Table 8-5: Stay-in-Business (SIB) Capital Greenside LoM 2021

	2021	2022	2023	2024	2025
SIB Capital (ZARm)	232	169	35	-	-

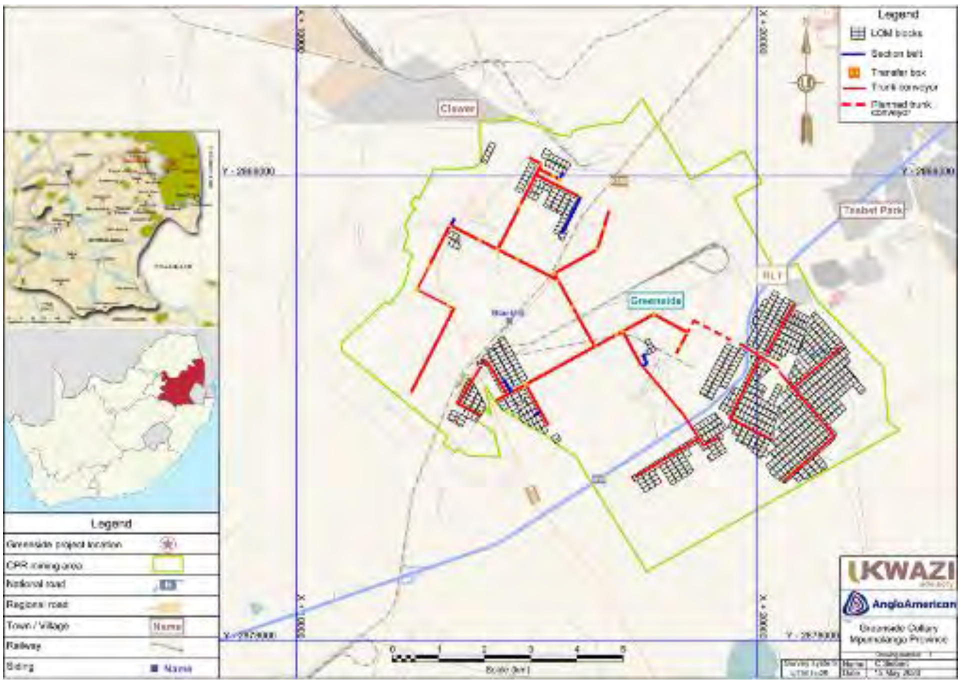
8.8. Life of Mine Plan

[SR5.1(i)] [SR5.2(i)(ii)]

8.8.1. Mining Sections

The mine is planned around the deployment of the sections into the mining blocks, which are defined by the geological constraints and mining thickness. The access into these blocks by the primary conveyors is illustrated in Figure 8-13 and the intention is to complete the mining in the northern areas and then move into the southern blocks.

The underground sections at Greenside comprise five CM production sections, namely: Vumagara, George, Thusanang, Thandeka (the “super section”), Shosholoza and one training section for the Colliery Training College (**CTC**).



srk consulting	**GREENSIDE COLLIERY CPR** Reserve Blocks and Primary Access Conveyors *(Source: Ukwazi, 2020)*	Project No. 566644

Figure 8-13: Reserve Blocks and Primary Access Conveyors

Currently, two incline shafts are used to access the workings, the Daylight Shaft and the No 6 Shaft (belt incline shaft). No additional access shafts are planned for the remaining LoM.

Greenside still continues to deploy sections in pairs as far as possible. This is in line with the resource strategy plan that was developed and adopted in 2012. This LoM plan continues to follow that strategy. The pairing of sections also forms part of the strategy to minimise underground infrastructure by pairing sections that are not significantly geographically separate. All sections use the bord and pillar mining method. The deployment strategy also spreads the risk when encountering poor geological conditions and allows sufficient alternatives to be planned while the poor conditions are mined through. This will be necessary as the LoM progresses, as the sections will be encountering higher incidents of geological issues.

This strategy will hopefully allow the area in the north to be sealed where possible and conveyors, fans, etc. repurposed for use in the south.

The mine characterises the reserve block based on the geological issues and then uses that ranking to adjust the section productivity from the benchmark productivities.

8.8.2. Block Ranking

Block ranking pertains to the systematic ranking of the mining area as defined by the layout, according to the inherent physical conditions of the ground planned for mining and long-delay activities planned for the area. These long-delay activities relate to section moves. For each condition or activity, a discount factor is applied on the benchmark mining rate associated with a specific area of the plan. The physical conditions are characterised from geological features such as dykes, slips, faults, sill transgressions, fissures and other geological anomalies. The geological features are incorporated into a geological settings plan. This plan is then used as the basis to relate the geological features with the associated segments of the layout in order to apply the respective discount factors on benchmark mining rates.

The discount factors applied were derived from historical data pertaining to the actual production realised from areas with similar conditions and the duration of section moves. In Table 8-6, the factors applied for the respective geological features and activities are shown.

Table 8-6: Greenside Geological Discounts in Productivity

Geological Feature	Discount Factor
Dykes, slips, sill transgressions	0.05
Floor undulations	0.10
Severe floor undulations	0.14
Remnants	0.10
Section moves	0.04

The factors are then aggregated, depending on the features or activities occurring in an area, and the overall factor is applied to the benchmark rate. The ranking of an area is then allocated on the range level of the overall factor, with ranking ranging from A to D. The ranking is depicted in Table 8-7.

Table 8-7: Ranking of an Area

Range Level	Meaning	Ranking
1	100% of benchmark rate	A
Less than 1 but greater than 0.9	Less than 100% and greater than 90% of benchmark rate	B
Less than 0.9 but greater than 0.68	Less than 90% and greater than 68% of benchmark rate	C
Less than 0.68 but greater than 0	Less than 68% and greater than 0% of benchmark rate	D

8.8.3. Production Scheduling

The resultant rates per area are then applied together with the direct operating hours in the production scheduling. The direct operating hours (**DOH**) are determined from total hours available for mining operations, by removing the unproductive days. Unproductive days are a function of the shift pattern and public holidays. There are two shifts worked at Greenside from Monday to Friday, with one shift on a Saturday. The total controllable time is then calculated using the following formula:

Production days x 17.33

The 17.33 factor is derived from is 9.25 hour shifts x two production shifts minus travel in and out time, as well as shift change time. The section DOH is then calculated as follows:

Controllable time x Availability x Utilization

The baseline production tonnage for each section before any block ranking is then calculated as follows:

Section DOH x Section Rate

These tonnes are then used as the basis for mining scheduling with the application of the discount factor as per the block ranking.

The outcome of the block ranking shows that the East Block is ranked as a C-area. This is mainly due to floor undulations and the lower mining heights expected in this area. The Navigation Block in the north is a combination of B and C, mainly due to known poor ground conditions, with friable roof experienced in this area. The Waterpan North area is mainly ranked as A, with some patches of B ground on both No 4 Seam and No 2 Seam. The block ranking results are shown in Figure 8-14 for the No 4 Seam.

srk consulting | **GREENSIDE COLLIERY CPR** Block Ranking in the No 4 Seam | Project No. 566644

Figure 8-14: Block Ranking in the No 4 Seam

A further adjustment is made for the variation in mining height. All these points are combined into the mine schedule productivity, which is used in the plan to allow for the respective conditions to adjust the availability and utilization, which controls the final productivity. This is applied to the benchmark to forecast the tonnes mined; a check is made against the final direct operating hours forecast and the final total production to ensure that there is some return to actual performance. These final curves are illustrated in Table 8-8 but further detail can be obtained from the accompanying mine technical report.

Table 8-8: Benchmark to Forecast Tonnes Mined

Classification	Ground Condition Rating	Benchmark Availability %	Factor Availability	Benchmark Utilization	Factor Utilization
A	1.00	94	1.00	89	1.00
B	0.90	93	0.99	79	0.99
C	0.68	91	0.97	74	0.93
D	0.00	87	0.93	55	0.69

The historical production is shown in Table 8-9.

Table 8-9: Historical Production per Section

Section	2017 (Mt)	2018 (Mt)	2019 (Mt)	2020 (Mt)
George	1.00	1.02	0.87	0.70
Thandeka	1.05	1.11	1.10	1.16
Thusanang	0.89	1.00	1.13	0.94
Vumagara	1.12	1.20	1.16	1.13
Shosholoza	0.62	0.73	0.71	0.72

Note:
1. 2020 consists of eight month's actual production and four months forecast production (source: "OUT_Profit Forecast Monthend Aug 2020.xls" – AAC, 2020h)

As can clearly be seen, the mine frequently produces sections that produce a million tonnes per annum and the range of monthly production has shown performances of up to 1.5 Mtpa in certain months. The training section has been planned at 1 ktpm or 12 ktpa.

In the benchmarking process, Greenside participates in an industry-wide production benchmarking undertaken by MCS Consulting Services and is consistently the top performer in the process. The most recent data is shown in Figure 8-15.

The mine blocks in the No 2 Seam in the Waterpan North area have been excluded from the schedule as well as the blocks under the Blaauwkrans MRD, which in previous plans were scheduled last due to low yield and mining height restrictions. It is clear that with the strategy of mining away from the north the potential costs to recover these blocks will make them uneconomic at the end of the mine life. Therefore, these blocks are excluded from the Coal Reserves and returned to Coal Resources.

In previous mine plans, the margin ranking of the blocks was undertaken on the No 4 Seam with the following input parameters presented in Table 8-10.

Table 8-10: Block Margin Ranking Input Parameters

Item	Unit
Mining: Fixed cost	ZAR41.93/t
Mining: Variable	ZAR40.28/t
Processing: Fixed	ZAR22.18/t
Processing: Variable	ZAR19.20/t
Services: Fixed*	ZAR27.71/t
Services: Variable*	ZAR17.59/t
Selling expenses	ZAR213.08/t
Long term real price (5 500 kcal/kg)	USD56.06/t
Long term real price (5 700 kcal/kg)	USD60.46/t
Long term real price (5 850 kcal/kg)	USD64.75/t
Long term real price (6 000 kcal/kg)	USD69.10/t
Exchange rate	ZAR13.64/USD

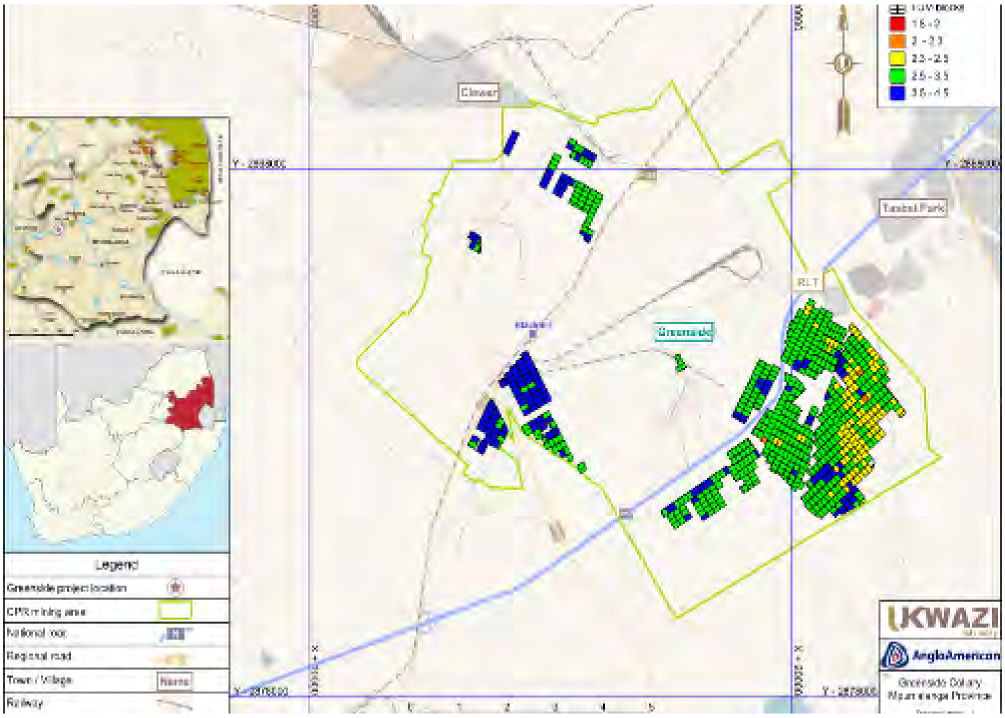
This yielded the margin ranking plot for 2019 shown in Figure 8-15.

srk consulting	**GREENSIDE COLLIERY CPR** Margin Ranking ZAR/tonne LoM 2019	Project No. 566644

Figure 8-15: Margin Ranking ZAR/tonne LoM 2019

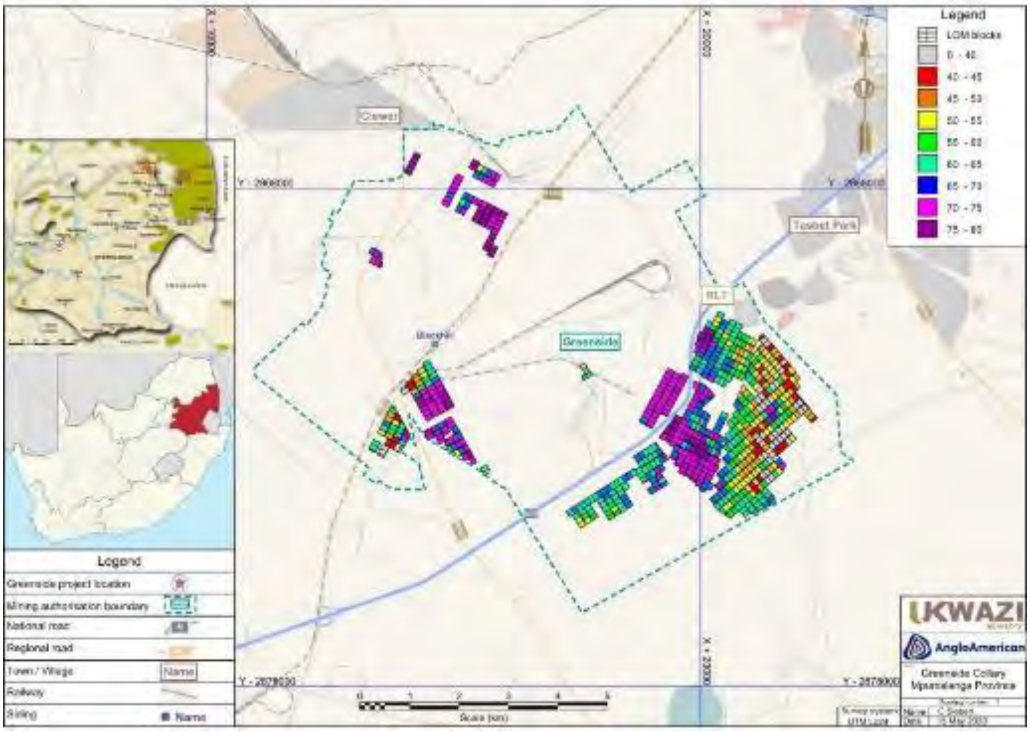
Based on the updated parameters for 2020, the mining costs have not increased significantly (+6%) while the average export coal price has decreased significantly (-15%), due to exchange rate fluctuations and decreasing international coal prices. Thus, the blocks as scheduled are still likely to have a positive margin. The same trend is still likely in that as the mining panels reach the thinner seam areas, which are of lower yield, the last year of the plan will be margin neutral.

There is also a trend to a lower mining height over time as illustrated in Figure 8-16:. While the necessary adjustments are made to the productivity, it is difficult to forecast how the current machines will perform at the lower mining height. It is expected that in some cases there may be increased contamination from the roof horizon in the thinner seams with the current equipment. Some thought has been applied to replacing the lost cutting time with alternative equipment, but it appears that the current "super section" approach is managing the problem well. There may be equipment available from other Company operations that could be used to extend the concept into other sections. Similarly, the declining yield as shown in Figure 8-17: will also have an impact on the margin ranging over time with the lower margins occurring towards the end of the mining sequence.



srk consulting	GREENSIDE COLLIERY CPR Mining Height of the No 4 Seam *(Source: Ukwazi, 2020)*	Project No. 566644

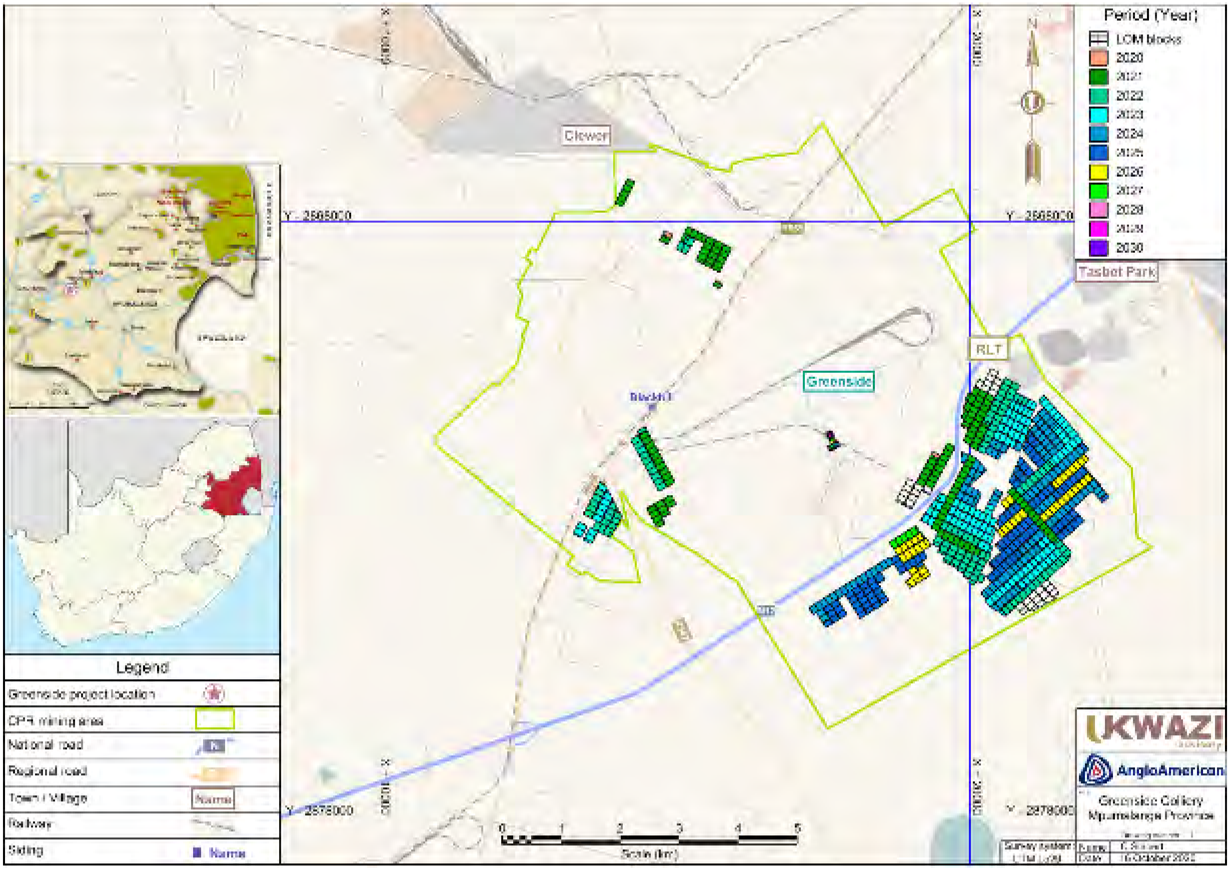
Figure 8-16: Mining Height of the No 4 Seam



srk consulting	GREENSIDE COLLIERY CPR Primary Yield for 5 850 kcal/kg Product *(Source: Ukwazi, 2020)*	Project No. 566644

Figure 8-17: Primary Yield for 5 850 kcal/kg Product

The resultant schedule of the respective sections is shown in Figure 8-18 and demonstrates the deployment strategy of a move from the north to the south and the opening up of the primary developments to the boundaries as quickly as possible to create alternatives and then a return to the least risk panels at the remaining years of the schedule.



GREENSIDE COLLIERY CPR
LoM 2020 Schedule Time Sequence
(Source: Ukwazi, 2020)

Project No.
566644

Figure 8-18: LoM 2020 Schedule Time Sequence

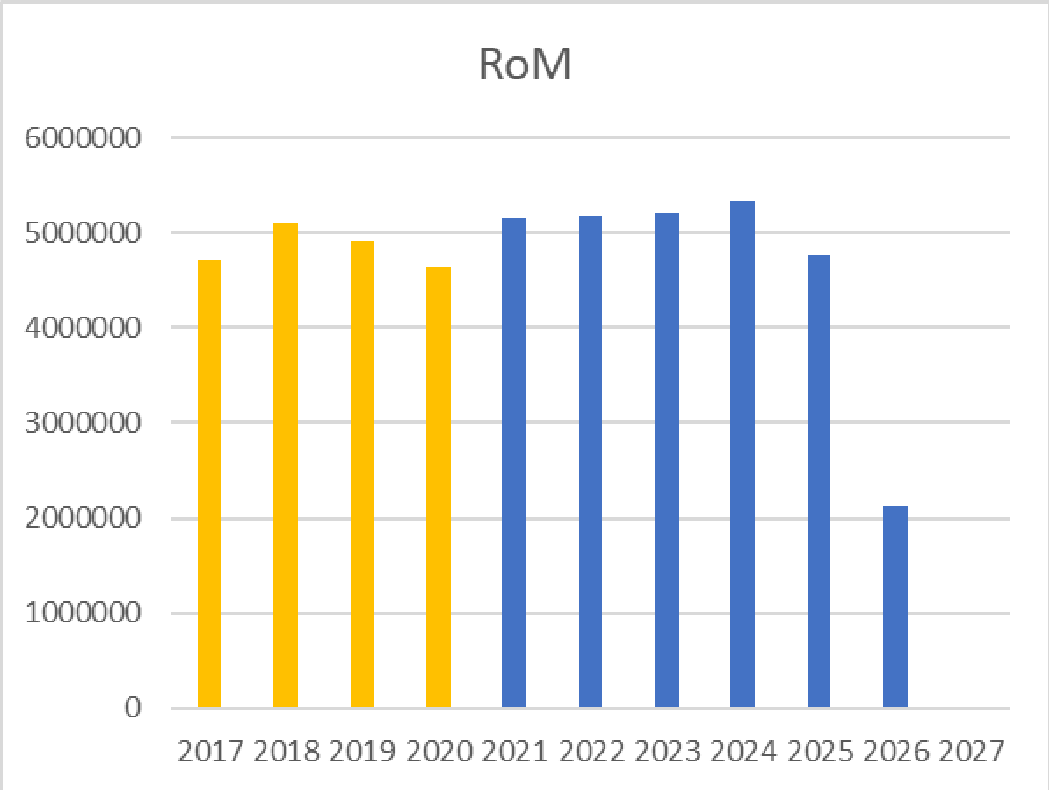
The LoM scheduled volumes from underground are presented in Table 8-11.

Table 8-11: 2021 LoM Plan Scheduled Volumes from Underground (Calendar Years)

Description	2021	2022	2023	2024	2025	2026
Mass (t) RoM	5 145 319	5 170 650	5 201 281	5 333 612	4 765 831	2 128 982
Mining Height (m)	3.37	3.26	2.97	3.08	3.06	2.82
Raw CV[1] (MJ/kg)	23.09	21.93	21.28	21.10	21.38	21.62
Raw Ash (%)	26.27	29.81	31.74	32.50	31.43	30.79
Mass (t) Prime Sales	3 670 371	3 281 082	3 059 000	3 369 826	3 131 562	1 433 787
CV[1] (MJ/kg)	26.91	26.89	26.87	26.25	26.24	26.24
Mass (t) Middlings Sales	253 088	358 404	328 913	214 500	186 792	83 700
CV[1] (MJ/kg)	22.00	22.00	21.96	21.50	21.50	21.49

Note:
5% COVID tonnage adjustment in 2021

The scheduled annual tonnage from underground at approximately 4.65 Mt in 2020 can be compared to the historical Run-of-Mine (**RoM**) of approximately 4.98 Mt in 2019 inclusive of the CTC section, illustrating the potential productivity that is applied in the schedule has a reasonable correlation to actual performance from the underground as shown in Figure 8-19. Note that the first half of the 2020 year was interrupted due to the COVID lockdown which affected the tonnage produced. The overall schedule in 2021 has been reduced by 5% for the COVID impact and the tonnage caught up in 2026.



srk consulting	**GREENSIDE COLLIERY CPR** Historical Performance: RoM UG vs 2020 LoM Plan	Project No. 566644

Figure 8-19: Historical Performance: RoM UG vs 2020 LoM Plan

9. Coal Reserve Estimates

[12.10(h)(vii)(ix)] [SR4.2(ii), SR4.5(i)(iii), SR5.1(i)(ii), SR5.2(ix), SR5.6(v), SR6.1(i)(ii)(iii), SR6.2(i), SR6.3(i)(vi)] [SV1.2, SV1.9, SV1.10]

9.1. Conversion of Coal Resources to Coal Reserves

9.1.1. Key Assumptions

[SR4.2(ii), SR4.5(iii), SR6.1(i)(iii)]

The estimation of the Coal Reserves from the Coal Resources is done by applying a series of Modifying Factors, production resources, physical and techno-economic constraints and assumptions to create a reasonable schedule of the forecast production performance on a RoM and saleable coal product basis. The aim of this process is to minimise the variance between actual and planned production metrics. As is shown in Figure 9-1: the modifying factors are tracked and reconciled historically to ensure good forward forecasts of Coal Reserves

srk consulting	**GREENSIDE COLLIERY CPR** Contamination and Mining Height Reconciliation: No 4 Seam *(Source: AAC, 2019ae)*	Project No. 566644

Figure 9-1: Contamination and Mining Height Reconciliation : No 4 Seam

9.1.2. Key Parameters

[SR4.2 (ii)(iv), SR4.3(ii), SR4.5(iii), SR6.1(i)]

The Coal Reserve estimate was based on the mining model, scheduled in XPAC version 14. Appropriate Modifying Factors were applied to the mining layout that was designed to suit the available mining equipment. The layout was constrained by the infrastructure limits within the property and the mine plan. A mining schedule was created up to the economic mining limits of the mining layout. The Coal Reserves are an accumulation of the RoM coal tonnes and saleable coal products scheduled from the Effective Date to the end of the schedule, based on the techno-economic mining limits, not the mine design limits. The RoM Coal Reserve was stated at 8% total moisture on an as received (**ar**) basis while coal qualities were reported on an air-dried basis.

9.2. Impact of the Modifying Factors

[12.10(h)(vii)] [SR5.1(i)(ii), SR6.1(iii), SR6.2(i)] [SV1.10]

The following Modifying Factors were applied in Gradecon when converting No 4 Seam Coal Resources to Saleable Coal Reserves:

- **Geological loss** (losses due to unknown geological complexities): 7%;
- **Mining modifying factors** (conversion of MTIS on an air-dried basis (**$MTIS_{adb}$**) to air-dried contaminated (**adc**)):
    - *Mining loss*: 2.5% mining losses have been applied to $MTIS_{adb}$ to derive RoM on an air-dried basis (**RoM_{adb}**);
    - *Mining extraction*: The extraction percentage is part of the layout design and is calculated based on the safety factor of an area. The factors calculated and applied for the various areas are included in the in-panel design discussion in the LoM plan;
    - *Contamination*: contamination at 100% ash has been applied on $MTIS_{adb}$ to derive RoM on an adc basis (**RoM_{adc}**). Different levels of contamination have been applied to different areas within the mine plan:
        - Cairn Shaft area (Blaauwkrans, Navigation, Waterpan North No 4 Seam and East Blocks) - 5% contamination; and
        - Weltevreden Block (western section of the colliery) - 3% contamination.
- **Moisture correction factor** (conversion of the RoM_{adc} to RoM as received (**ar; RoM_{ar}**)): the moisture correction factor is applied to the RoM_{adc} either as total moisture or as surface moisture added to the inherent moisture. With the LoM plan, surface moisture of 2.5% was added to RoM_{adc} to derive $RoM_{ar;}$ this approximates a total moisture of 8%. To derive the Saleable Coal Reserves, 8% total moisture was applied on saleable tonnes (ar);
- **Modelling limits**:
    - *Minimum practical mining height* - 2.0 m;
    - *Maximum practical mining height* - 4.5 m; and
    - *Product yield:* this is based on the wash plant design; where when the yield drops below 40%, the discard stream in the plant becomes overloaded. Note that there are no mining blocks where this restriction applies.

The Modifying Factors are summarised in Table 9-1:

Table 9-1: Modifying Factors

Modifying Factor	Blocks	Value
Geological loss	All	7%
Mining loss	All	2.5%
Mining extraction	All	Variable, depending on Safety Factor required
Contamination	Navigation, Waterpan North No 4 Seam, East	5%
	Weltevreden	3%
Moisture correction	All	2.5%
Minimum practical mining height	All	2.0 m
Maximum practical mining height	All	4.5 m
Product yield	All	>40% (no mining blocks where this restriction applies)

9.3. Coal Reserve Statement

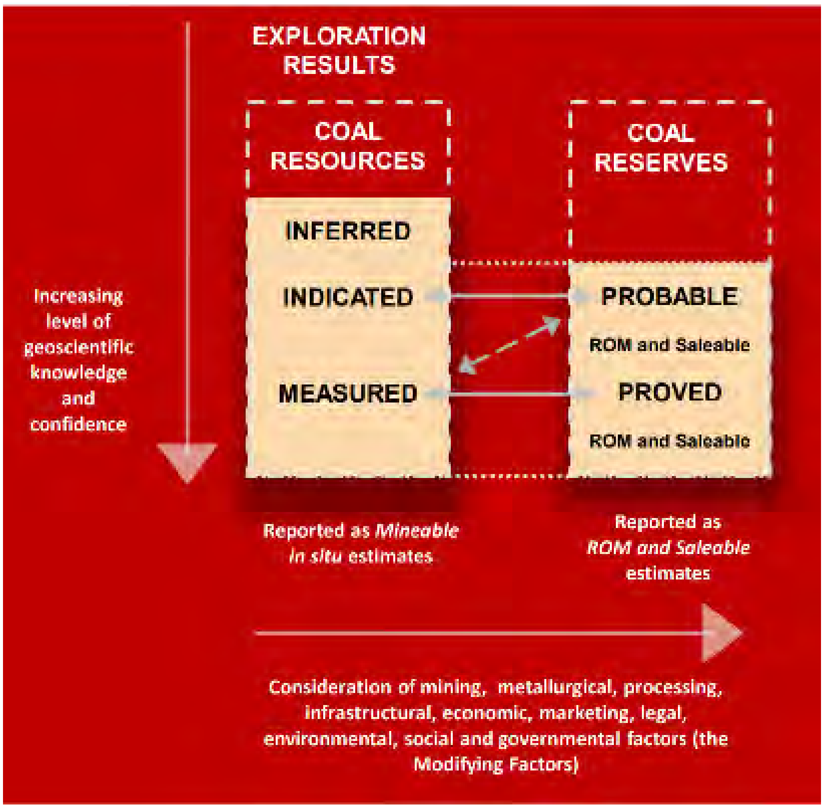
[12.10(h)(ix] [SR5.2(ix), SR5.6(v), SR6.1(ii), SR6.3(ii)] [SV1.9]

9.3.1. Coal Reserve Category Definitions

[SR6.2(i)]

The Coal Reserves are classified into Proved and Probable Coal Reserves dependent upon the geological classification of the Coal Resources included in the Coal Reserves, along with other factors of uncertainty pertaining to the mine design or coal quality. Typically, the Measured Coal Resources are the basis for the Proved Coal Reserves while the Indicated Coal Resources make up the Probable Coal Reserves. Where Inferred Coal Resources have been included in the mine planning in order to facilitate mining, they are included in the Probable Coal Reserves; the percentage of Inferred Coal Resources in the mine plan must be stated. At Greenside, all the Coal Resources are classified as Measured or Indicated Coal Resources, hence all the Coal Reserves are classified as Proved or Probable Coal Reserves. In Greenside, some of the resource blocks that are at a Measured density of drilling are downrated to Indicated status where there is a higher risk from other unknown factors such as geological conditions and infrastructure issues. Figure 9-2 shows the relationship between Coal Resources and Coal Reserves, as per Figure 2 of the SAMREC Code.

Within the Greenside Coal Resources, the mining plan has been laid out over some areas classed as Inferred Coal Resources. Some of the panels mine through these Coal Resources for access purposes; however, these Inferred Coal Resources are not included as Coal Reserves, but merely noted in the Reserve Statement.



srk consulting	**GREENSIDE COLLIERY CPR** Relationship between Coal Resources and Coal Reserves (*SAMREC Code, 2016*)	Project No. 566644

Figure 9-2: Relationship between Coal Resources and Coal Reserves according to the SAMREC Code

9.3.2. Moisture Reporting Basis

Whereas the Coal Resources are modelled on an air-dried basis, (which includes the inherent moisture) the Coal Reserves are reported at a total moisture of 8% to replicate the moisture content of the delivered sales product. Similarly, the sales qualities are reported on a Gross as Received (**GAR**) basis similar to the prices for export coal.

9.3.3. Coal Reserve Statement

[12.10(h)(ix] [SR1.4(iv), SR6.1(ii), SR6.3(i)(ii)(v)] [SV1.9]

The Coal Reserve estimate has been independently estimated by and signed off by Mr N McGeorge on behalf of SRK, based on the mining model supplied by the Company and verified by SRK. The Coal Reserve estimate is declared as at 31 December 2020.

The Coal Reserves for Greenside on a total basis[6] (100% attributable to Greenside) at 31 December 2020 are summarised in Table 9-2.

Table 9-2: Greenside Coal Reserve Statement as at 31 December 2020

RoM Coal Reserves				Saleable Coal Reserves (NAR)				
Reserve Category Classification	**RoM_{ar} (Mt)**	**Total Moisture (%)**	**CV^{1}_{adc} (kcal/kg)**	**Reserve Category Classification**	**Sales (Mt)**	**Practical Yield (%)**	**Total Moisture (%)**	**CV^{1}_{ar} (kcal/kg)**
Proved	25.8	8.0	5 202	Proved Prime	16.7	64.6	8.0	6 006
				Proved Secondary	1.3	5.3	8.0	4 930
Probable	0.1	8.0	4 889	Probable Prime	0.0	63.9	8.0	5 993
				Probable Secondary	0.0	4.7	8.0	4 943
Total	**25.9**	**8.0**	**5 201**	**Total**	**18.0**	**69.8**	**8.0**	**5 927**
Inferred in Mine Plan	1.9	8.0	5 194	Prime	1.2	65.3	8.0	6 076
				Secondary	0.1	5.3	8.0	4 967

Note:

1. Assumes coal supply until 2026.
2. RoM_{ar} = Run of Mine on an as received basis
3. Coal sales quality is as received, RoM quality is air dried contaminated for comparison to 2019 estimates.
4. CV^{1}_{adc} = Calorific Value air dried, contaminated.
5. CV^{1}_{ar} = Calorific value as received.

The Coal Reserves are extracted from the mining schedule model and are from the Effective Date to the last period scheduled (April 2026). All the Coal Reserves are from the No 4 Seam. The coal sales quality is quoted as a gross as received basis to match the way coal prices are quoted in the financial evaluation.

9.4. Reconciliation with Previous Reserve Estimate

[SR1.4(iv), SR4.5(vi), SR6.3(iv)] [SV1.6]

The 2020 Coal Reserves as at 31 December 2020 are compared with those of 31 December 2019 (Table 9-3).

[6] Note that “total basis” refers to 100% of the Coal Resources and/or Coal Reserves attributable to the Greenside Area of Responsibility and is equivalent to the term “gross” used in the AIM Mining Guidance.

Table 9-3: Comparison of Greenside Coal Reserves at 31 December 2020 and 31 December 2019

Reserves Classification Category	RoM Coal Reserves				Saleable Coal Reserves			
	Mass (Mt)		CV^1_{adc} (kcal/kg)		Mass (Mt)		CV^1_{ar} (kcal/kg)	
	2020	2019	2020	2019	2020	2019	2020	2019
Proved	25.8	21.3	5 202	5 190	18.0	15.3	5 927	5 940
Probable from Measured	0.1	12.6	5 914	4 890	0.0	9.9	5 915	5 933
Probable from Indicated	-	1.7		5 480	-	0.1		
Total Reserves	**25.9**	**35.5**	**5 201**	**5 100**	**18.0**	**25.3**	**5 927**	**5 933**
Inferred in LoM Plan	1.9	0.1	5 194	4 730	1.2	0.05	5 985	5 880
Total in Mine Plan	**27.8**	**35.6**	**5 201**	**5 110**	**19.2**	**25.3**	**5 901**	**5 920**

Note:
1. CV^1_{adc} = Calorific Value air dried, contaminated.
2. CV^1_{ar} = Calorific Value as received.

In the Company CPR dated 31 December 2019, the schedule differs from the current schedule in that the blocks in the north eastern portion have been returned to Coal Resources, which accounts for approximately 1.81 Mt. Similarly, the Inferred Coal Resources in the 2020 plan are only partially mined and are returned to Coal Resources from the 2019 plan (2.5Mt). The depletion in the two time periods is estimated at 4.6 Mt and the difference between the two estimates is 10.3 Mt, of which the above explanations account for 8.9 Mt between the estimates. This is demonstrated in Table 9-4.

Table 9-4: Reconciliation between the 2019 and 2020 Coal Reserve Estimates

Description	Tonnage (Mt)	Comment
Coal Reserve Estimate 2019	**35.5**	
Exclude Coal Reserves in Northeast Block	-1.8	Blocks under MRD
Exclude Inferred Coal Resources	-2.5	No quality data
Less Coal mined in 2020	-4.6	
Less other blocks not mined	-0.7	
Coal Reserves 2020	**25.9**	

9.5. Specific Coal Reserve Estimate Risks

[12.10(h)(x)] [SR5.7(i)]

The risks specific to Coal Reserve estimates are presented in Table 9-5.

Table 9-5: Specific Coal Reserve Estimate Risks

Reserve Risk	Rating
Mining seam thickness reduction larger than estimated leading to increased contamination	Medium
Geological conditions worse than anticipated increasing in panel contamination	Medium
Geological conditions affecting access to reserve blocks	Low
Secondary sales not achieved due to plant overload	Low
Increased reserve in north due to recovery of panels close to geological features	Low
Increased Reserve due to undermining of surface features	Low
Reserve loss due to shallow mining	Med
Reserve gain in inferred blocks excluded from plan	Low
Reserve gain due to No 2 Seam hydrological risk	Low

The reader is referred to the risk assessment section (Section 0) of this report for further identified risks and their mitigations.

9.6. Mineral Residue Deposit

The mine has a large MRD present on the property; namely, the Greenside MRD, shown in Figure 9-3. At present, the MRD is active, being used for the placement of discards and fine coal in a series of pockets, while the completed pockets are being recovered on an opportunistic basis and fed into the No 5 Seam plant, along with some of the material derived from the No 4 Seam middlings to extract any potential saleable product from the material.

GREENSIDE COLLIERY CPR
Greenside Mineral Residue Deposit
Project No. 566644

Figure 9-3: Greenside Mineral Residue Deposit

During 2019 approximately 1.2 Mt of sales product were sold into the domestic market from a feed of approximately 1.0 Mt into the No 5 Seam plant with the raw unbeneficiated discard material forming the balance. A similar trend occurred in 2020 with total sales of 0.93 Mt. The current discard material is a lower quality than the material placed in the dump prior to 2013, as the potential lower grade middlings were not considered prior to 2013.

At present, as there is a potential profit made in these MRDs, there should be some recognition of them as Coal Reserves. The approach by the Company has been to list three years of potential sales from the MRD as a separate Coal Reserve statement. The remaining material in the MRD is significantly larger than indicated in the Coal Reserve Statement but requires further evaluation before it can be classified as a Coal Reserve. In 2020, the estimated Eskom material depleted was 0.13 Mt and the raw discard sales were 0.8 Mt. These numbers have been used to deplete the reserve based to a December 2020 base. The Mineral Residue Deposit Reserve Statement is presented in Table 9-6.

Table 9-6: Mineral Residue Deposit Reserve Statement

Reserve Category Classification	RoM Coal Reserves			Saleable Coal Reserves			
	RoM (Mt)	Total Moisture (%)	Quality – CV^1_{ar} (kcal/kg)	Sales (Mt)	Practical Yield (%)	Total Moisture (%)	Quality – CV^1_{ar} (kcal/kg)
Probable Domestic Market	3.8	8.0	4100	1.7	45	8.0	5200
Probable Raw Discard	1.3	8.0	4100	1.3	100	8.0	4000
Total	**5.1**	**8.0**	**4100**	**3.0**	**-**	**8.0**	**-**

Note:
1. CV^1_{ar} = Calorific Value as received.

10. Coal Processing

[12.10(h)(vii)] [SR4.3(ii), SR5.2(viii), SR5.3]

10.1. Plant Description

[SR5.2(viii), SR5.3(iii), SR5.4(iii), SR6.3(iii)]

Greenside is one of the oldest mines in the Witbank area. It has been in existence for many years, initially supplying coal to the domestic market. In 1972, it was part of the original submission to the Japanese steel mills to produce low ash coal, which caused the RBCT and the coal line to be developed. At this time, the RLT was built to receive, load and onward transport coal from the then named Landau and Kleinkopje Collieries, as well as Greenside, to RBCT.

The site has had several coal preparation plants, which over time have grown, been re-purposed, modified and feed sources changed. As such, the plants reflect this by their seemingly complicated and arbitrary nature of the operation.

The mine currently has three plants, one to wash raw, primary mined coal known as the ”4 Seam plant”, one to primarily wash discard material from the very large mineral residue deposits, known as the “5 Seam plant” and a later plant which only treats the ultrafine material from the No 4 Seam plant.

The general overview of the Greenside Coal Washing Plants is shown in Figure 10-1.

srk consulting	**GREENSIDE COLLIERY CPR** General Overview of Greenside Colliery Coal Washing Plants	Project No. 566644

Figure 10-1: General Overview of Greenside Colliery Coal Washing Plants

10.1.1. No 4 Seam Plant

[SR5.3(iii), SR5.6(ii)]

The No 4 Seam plant is fed by coal mined from five underground mining areas, all from No 4 Seam and transported to surface stockpiles via a series of conveyors. The surface stockpiles have a nominal capacity of 64 000 t. The passage of the coal from the various mining areas to ultimately one conveyor, means that some mixing of the various coals can take place.

Underground operations run from Monday morning 6 am to Saturday morning 6 am, so the stockpiles need to be reasonably full to ensure that the plant can operate as planned over the entire weekend.

The No 4 Seam plant consists of three modules, with Modules 1 and 2 being identical and joined by a common fines (spirals) plant. Module 3 is separate and has its own fines (spirals) plant.

Ultrafine coal, nominally minus 150 microns, from the three modules is sent to a flotation plant for recovery of coal, which is dewatered using filter presses.

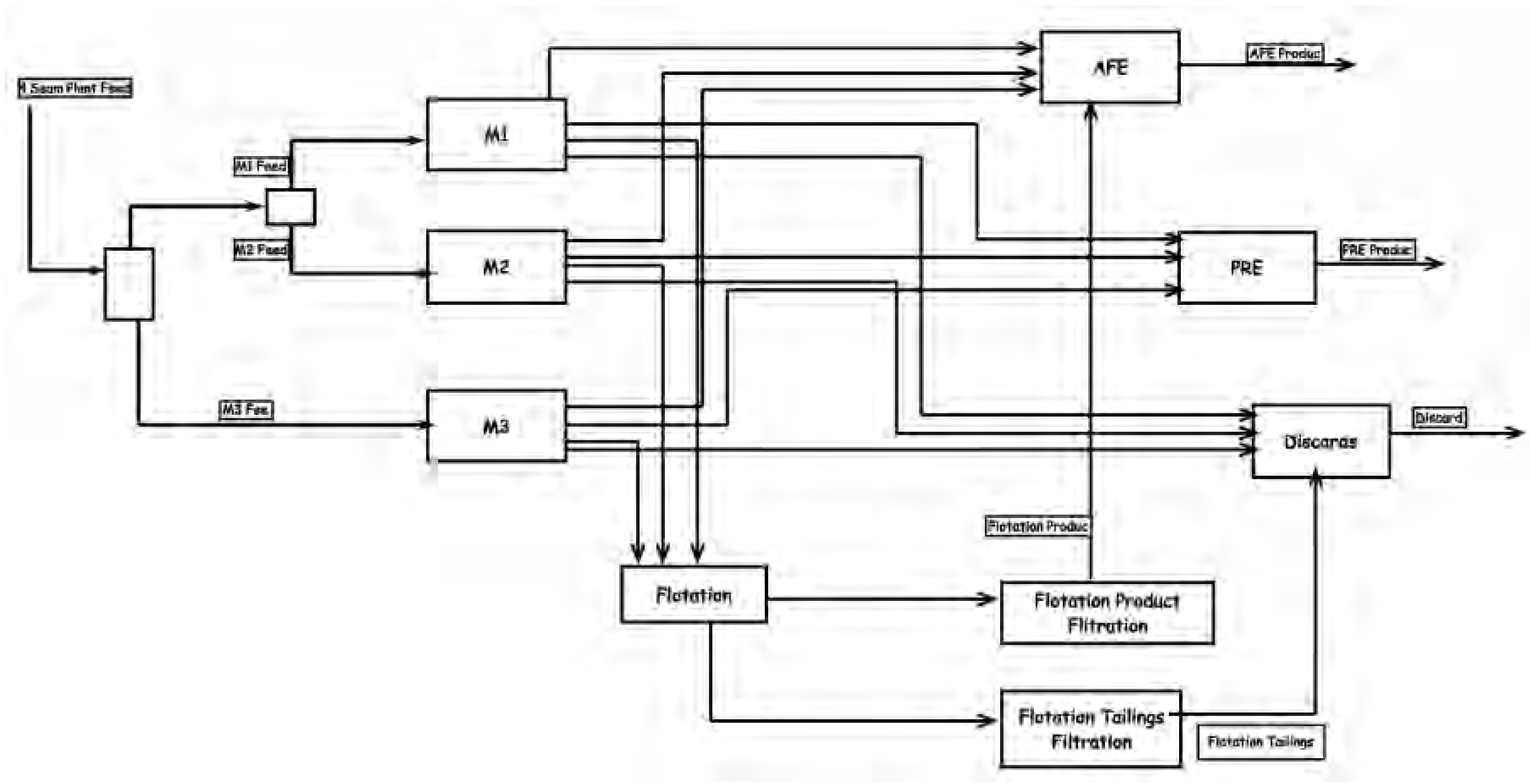
Presently, the No 4 Seam plant produces a primary product of 5 800 kcal/kg Net As Received Calorific Value and a middlings product of 4 800 kcal/kg, although these products can change depending on the demand from the Company's marketing department. The overall block flow diagram of the No 4 Seam Plant is shown in Figure 10-2 while the plant general arrangement is shown in Figure 10-3.

No 4 Seam Plant Run of Mine Infrastructure

The No 4 Seam Plant RoM infrastructure is made up of the following:

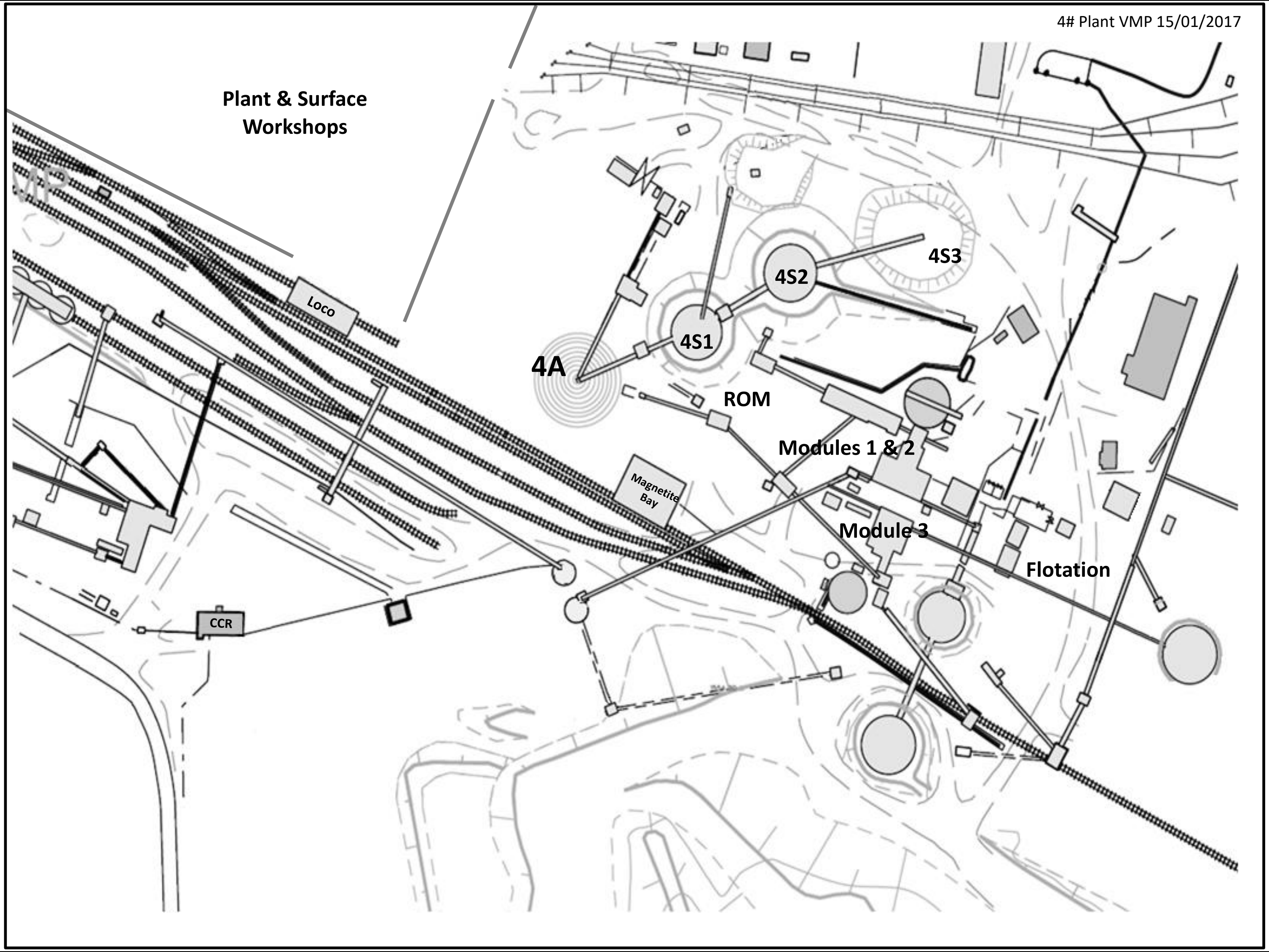
- Conveyor from underground;
- Stockpile 4A, with a 30 000 t nominal capacity;
- Stockpile S1, with 1 000 t nominal capacity;
- Stockpile 4S2, with a 1 000 t nominal capacity; and
- Nichshaft Stockpile, with 30 000 nominal capacity. This is primarily an emergency stockpile whereby front end loaders and trucks are used for reclaiming.

The No 4 Seam Plant RoM area is shown in Figure 10-4.



srk consulting | **GREENSIDE COLLIERY CPR** Block Flow Diagram of No 4 Seam Plant | Project No. 566644

Figure 10-2: Block Flow Diagram of No 4 Seam Plant



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Plant General Arrangement	Project No. 566644

Figure 10-3: No 4 Seam Plant General Arrangement

srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Plant RoM Area	Project No. 566644

Figure 10-4: No 4 Seam Plant RoM Area

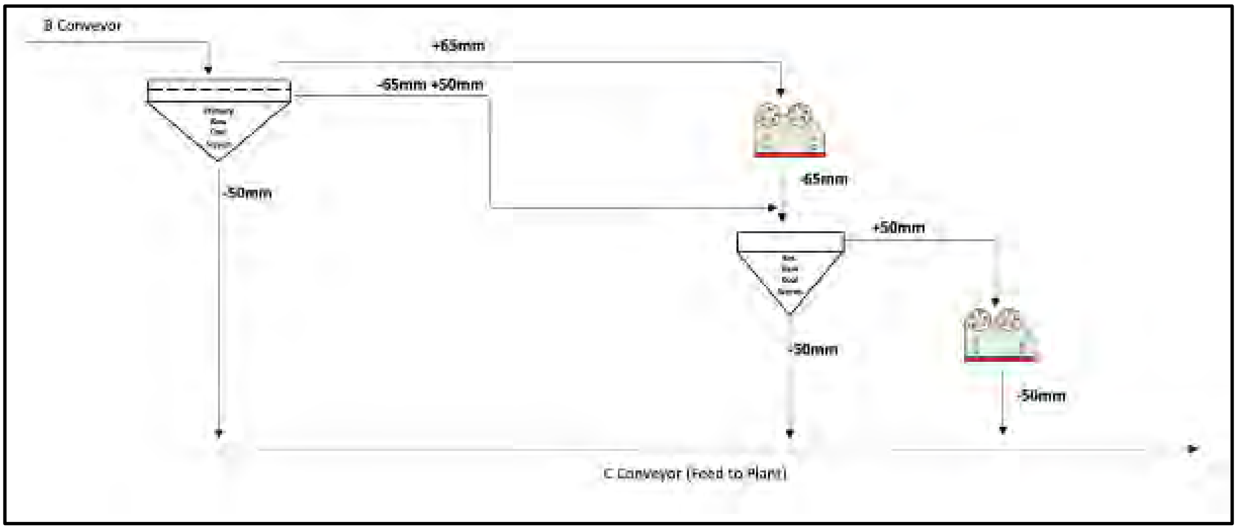
No 4 Seam Plant RoM Crushing and Screening Infrastructure

The crushing and screening infrastructure consists of:

- Module 1 and 2 crushing and screening circuit to reduce the feed to the Modules 1 and 2 wash plants to -50 mm; and
- Module 3 crushing and screening circuit to reduce the feed to the Module 3 wash plant to -50 mm.

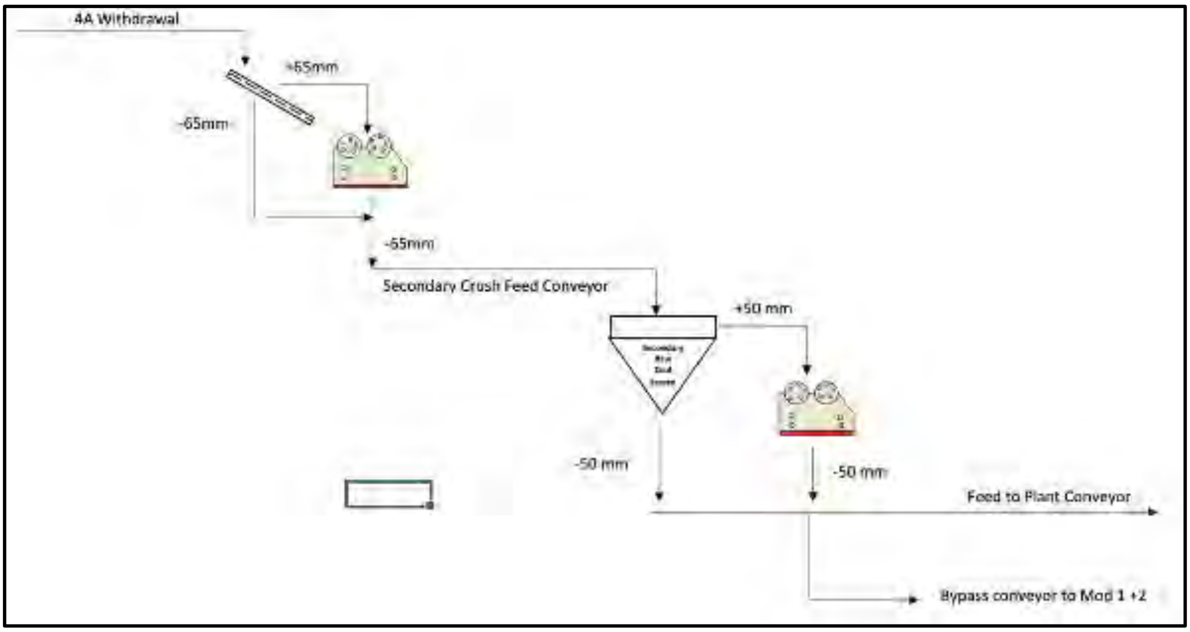
Module 3 crushing circuit uses a grizzly instead of the double deck screen that is used for Modules 1 and 2. The flow diagram for Modules 1 and 2 crushing and screening circuit is shown in Figure 10-5 while that for Module 3 is shown in Figure 10-6.

The Coal is transported by a 1 200 mm wide by 11.5 km long overland conveyor from the RoM tip at a rate of 1 600 tph. At the feed end of the overland conveyor an over-belt magnet, a sample station, a mass meter and an on-line analyser are installed. These are used for control and payment purposes and are critical for the mine quality control. The arrangement of the overland conveyor, the belt magnet and the sample station is shown in Figure 10-6.



	GREENSIDE COLLIERY CPR No 4 Seam Plant Module 1 and 2 RoM Crushing and Screening Flow Diagram	Project No. 566644

Figure 10-5: No 4 Seam Plant Module 1 and 2 RoM Crushing and Screening Flow Diagram



	GREENSIDE COLLIERY CPR No 4 Seam Plant Module 3 RoM Crushing and Screening Flow Diagram	Project No. 566644

Figure 10-6: No 4 Seam Plant Module 3 RoM Crushing and Screening Flow Diagram

srk consulting	GREENSIDE COLLIERY CPR No 4 Seam Plant RoM Primary Screening and Crushing Area	Project No. 566644

Figure 10-7: No 4 Seam Plant RoM Primary Screening and Crushing Area

No 4 Seam Plant Module 1 and 2 Washing Plants

Module 1 and 2 are identical and can each treat 250 tph. The current annual feed tonnage to the plant is 4.9 Mtpa, with a plan to ramp up to 5.2 Mtpa. The annual sales tonnage is sitting at 3.3 Mtpa. The plants use dense medium separation (**DMS**) process, with magnetite as a medium.

The washing vessel is a Tri Product Cyclone (**TPC**), which washes coal in the first stage to produce a prime product, AFE. The discard from the first stage of the TPC passes directly into the second stage, whereby middlings PRE and a final discard are produced. A -1 mm material from each module passes to a common fines circuit and because of the commonality, are maintained together.

No 4 Seam Plant Module 3 Washing Plant

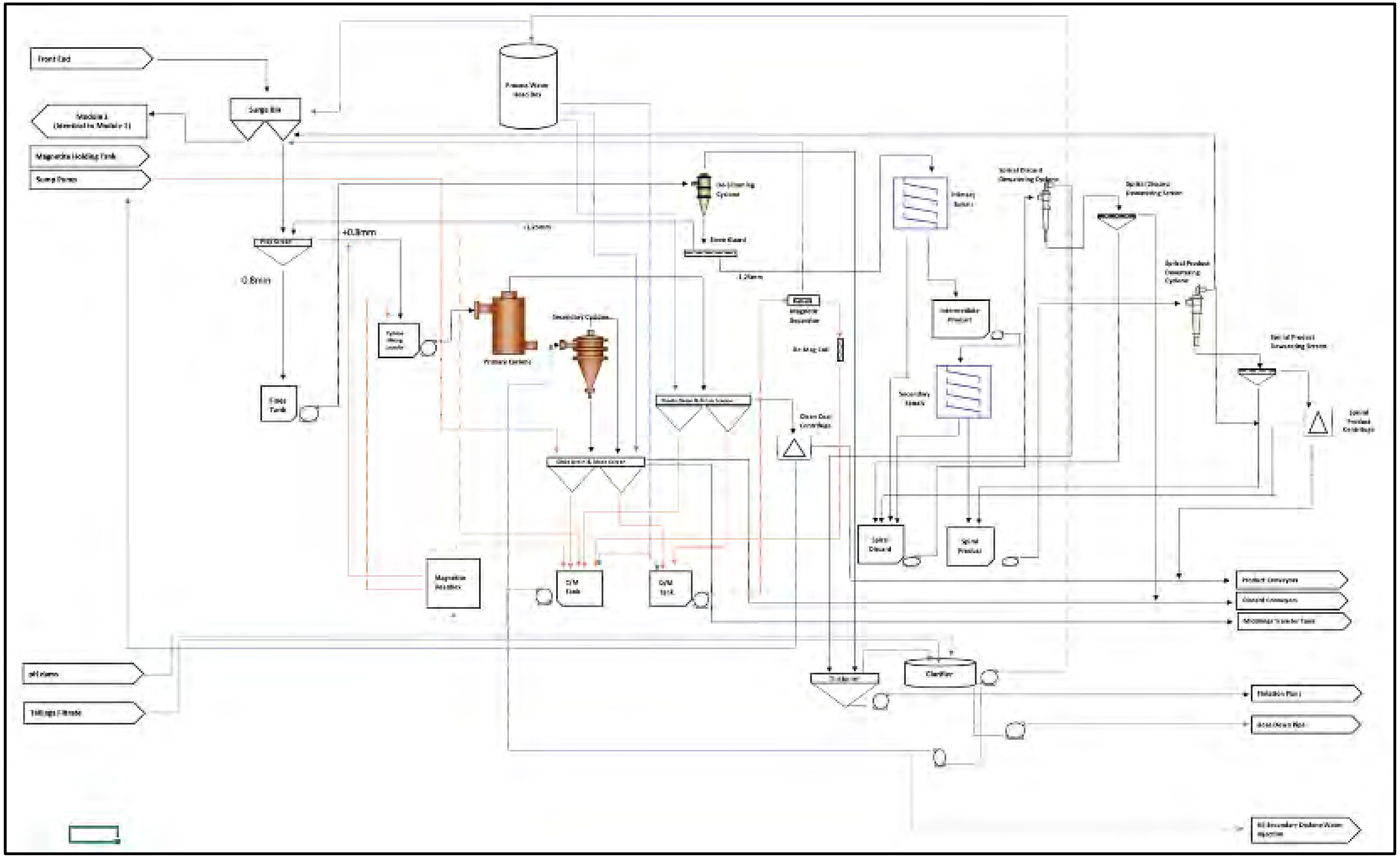
Module 3 works independently from Modules 1 and 2 and can treat 250 tph. It is also a DMS plant, using magnetite as a medium. The coal washing process is the same as that of Module 1 and 2, except that the -1 mm material is treated in its own fines circuit (spirals).

Figure 10-8 shows the plant area including part of the RoM, Modules 1, 2 and 3 and the flotation plant. The area is reasonably congested due to the nature of the way various parts of the plant have been added and other parts have been discontinued. The plant would not have been designed like this if it had been built as a greenfields operation. For example, the TPC is not ideal, as the second stage density cannot be controlled properly.

srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Plant Modules and Flotation Plant	Project No. 566644

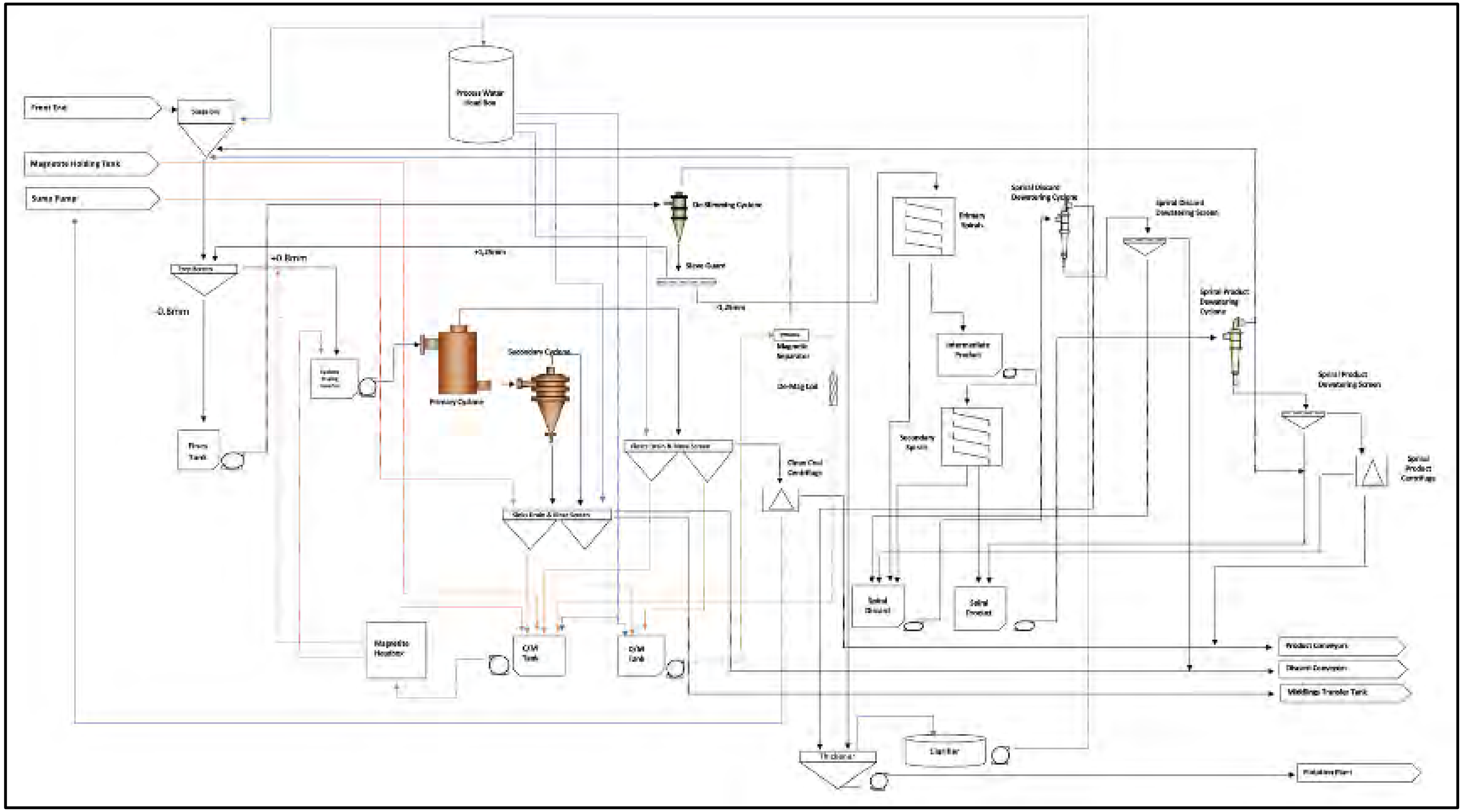
Figure 10-8: No 4 Seam Plant Modules and Flotation Plant

Figure 10-9 shows the flow diagram for Module 1 Washing Plant, which is identical to Module 2, while Figure 10-10 shows the flow diagram for Module 3 Washing Plant.



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Module 1 Washing Plant (Identical to Module 2)	Project No. 566644

Figure 10-9: No 4 Seam Plant Module 1 Washing Plant (Identical to Module 2)



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GREENSIDE COLLIERY CPR
No 4 Seam Plant – Module 3 Washing Plant

Project No.
566644

Figure 10-10: No 4 Seam Plant Module 3 Washing Plant

No 4 Seam Plant Clean Coal Screen

The No 4 Seam Plant clean coal screen is shown in Figure 10-11. The AFE product from this screen goes either directly to Conveyor K and ultimately to the RLT or passes onto the product stockpiles for later reclamation to the RLT or passes onto the product stockpiles for later reclamation to the RLT. See Figure 10-19 and Figure 10-20.

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GREENSIDE COLLIERY CPR
No 4 Seam Clean Coal Screen, AFE Product

Project No.
566644

Figure 10-11: No 4 Seam Plant Clean Coal Screen

No 4 Seam Plant Shared Middlings (PRE) and Discard Screen

The shared middlings and discard screen (Figure 10-12) is a divided screen which is used for the overflow of the secondary stage of the TPC (right half), PRE and the secondary stage TPC sinks (left half), which is the final discard. The final discard passes to the discard conveyor system, where it is deposited onto the discard dump. Room has been made by the reclaiming of mining of discards which are washed in the No 5 Seam Plant.

The No 5 Seam Plant is then used to wash dump material to a PRE grade. The middlings from the No 4 Seam Plant is also PRE grade. The method of combining the No 4 Seam PRE and No 5 Seam material is odd, but a consequence of the development of the plant.

The No 4 Seam Plant middlings and water are added to a tank and the coal is then pumped to the No 5 Seam Plant product stockpile area (Figure 10-13) onto a screen. The coal is then dewatered and added to the PRE product stockpile.

	GREENSIDE COLLIERY CPR Shared Middlings (PRE) and Discard Screen	Project No. 566644

Figure 10-12: Shared Middlings (PRE) and Discard Screen

	GREENSIDE COLLIERY CPR Pumping of Middlings to No 5 Seam Plant Product	Project No. 566644

Figure 10-13: Pumping of Middlings to No 5 Seam Plant Product

Flotation Plant

A flotation plant (Figure 10-14) is used to recover the ultrafine material, nominally -150 µ, emanating from No 4 Seam Plant using froth flotation. The plant is run by an external contractor, Enprotech, who specialises in flotation and operating filter presses. The technology, consisting of four Dual Cells, has been developed by AAC. Two filter presses (Figure 10-15) manufactured by Jingin, are used to dewater the froth flotation concentrate and three Jingin filter presses are used to dewater the tailings. The capacity of the flotation plant is 55 tph, concentrate filter presses is 30 tph and the tailings filter presses can treat 45 tph.

The concentrate quality target is:

- CV[1] 27.50 MJ/kg;
- Ash 14.5 MJ/kg;
- Moisture 21.0%.

The tailings quality target is:

- CV[1] 21.50 MJ/kg;
- Ash 28.0 MJ/kg;
- Moisture 22.0%.

srk consulting	GREENSIDE COLLIERY CPR Flotation Plant	Project No. 566644

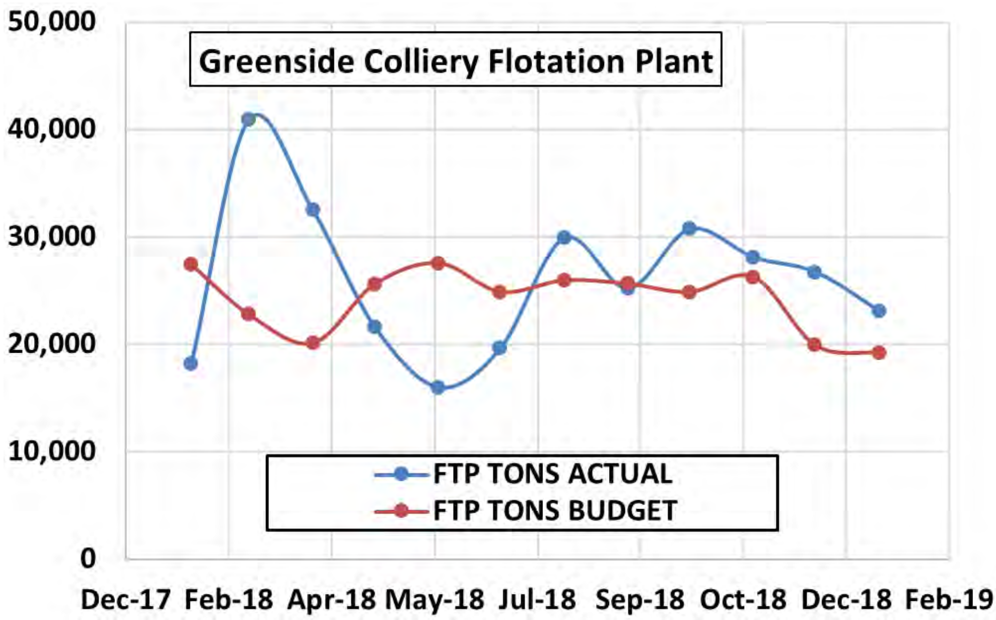
Figure 10-14: Flotation Plant

Enprotech also operates the two thickeners located in the flotation plant which thicken the concentrate and tailings stream before delivery to the respective filter presses.

The feed tonnages are shown in Figure 10-16, the product tonnages in Figure 10-17 and flotation yields in Figure 10-18. Qualities and costs were not available at the time of writing this report.

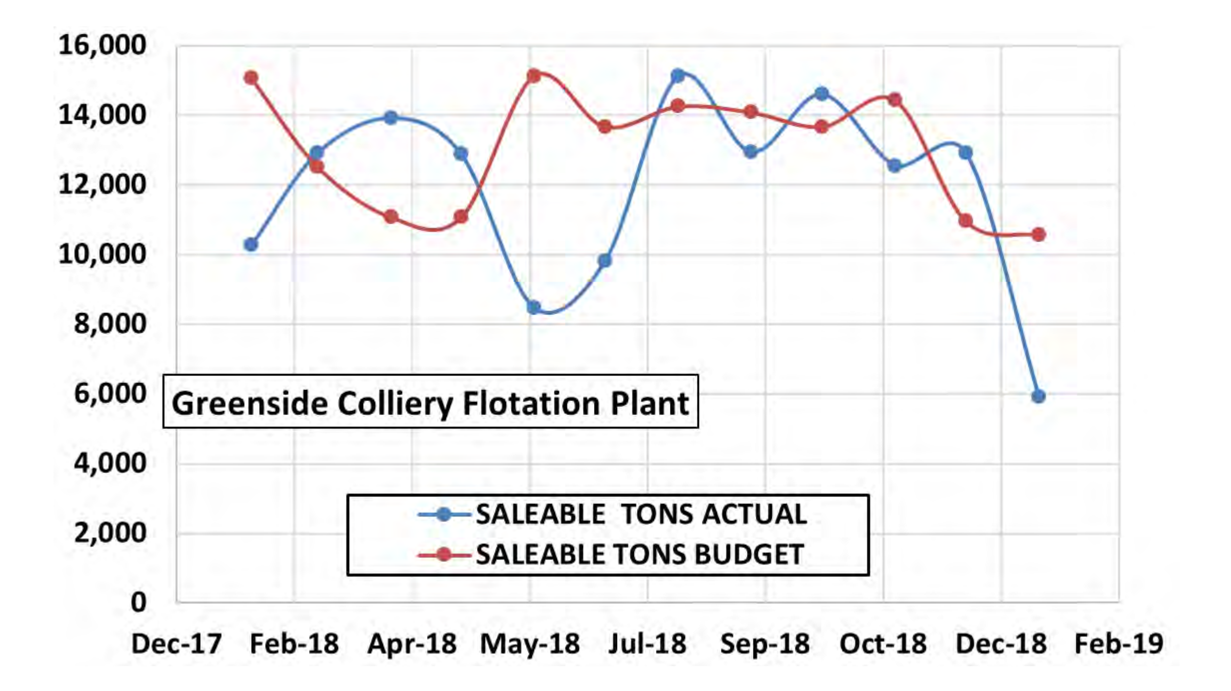
srk consulting	**GREENSIDE COLLIERY CPR** Filter Press	Project No. 566644

Figure 10-15: Filter Press



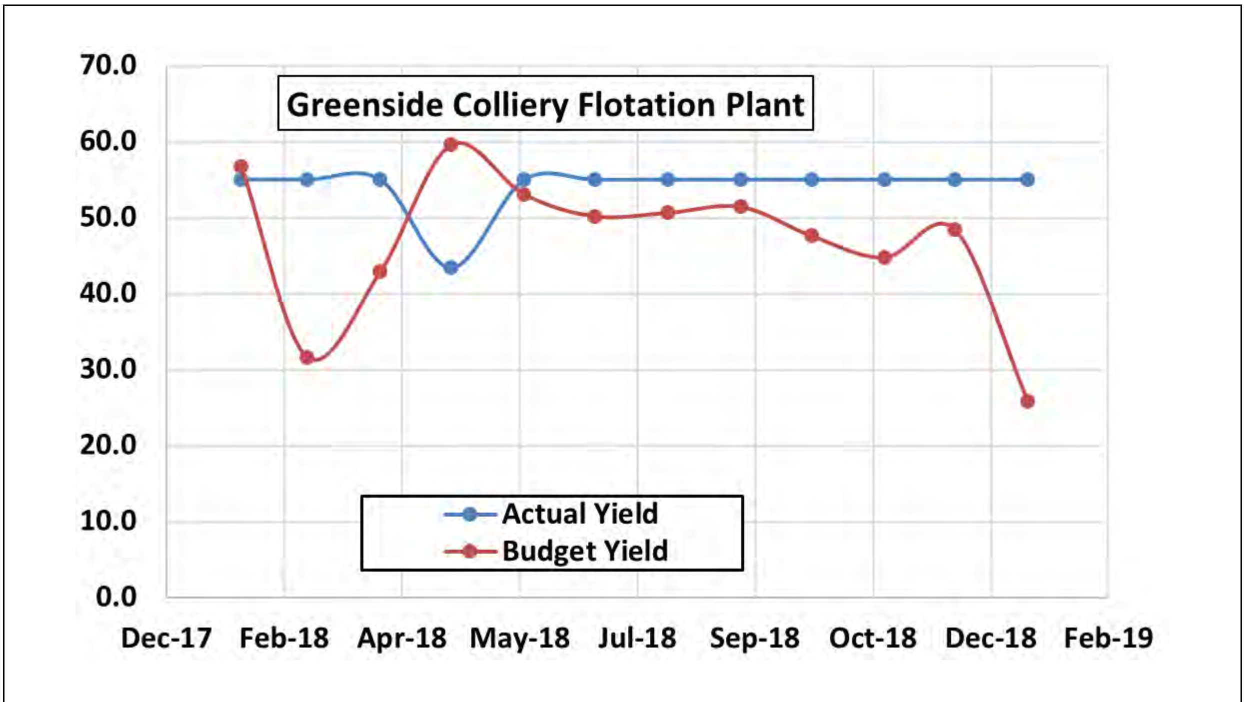
srk consulting	**GREENSIDE COLLIERY CPR** Flotation Plant Throughput (t)	Project No. 566644

Figure 10-16: Flotation Plant Throughput



srk consulting	GREENSIDE COLLIERY CPR Flotation Plant Production	Project No. 566644

Figure 10-17: Flotation Plant Production



srk consulting	GREENSIDE COLLIERY CPR Flotation Plant Yields	Project No. 566644

Figure 10-18: Flotation Plant Yields

As can be seen the flotation plant generally performs well against budget in terms of feed tonnage and yields.

Product Handling

Two products are produced by No 4 Seam plant, a prime product, AFE, at 5 850 kcal/kg net as received (NAR) and a middlings product, PRE at 4 800 kcal/kg NAR). The product handling system is shown in Figure 10-19. The actual quality produced does change sometimes in response to the market, but generally the qualities are:

Prime Product AFE (5 850 NAR kcal/kg) Qualities:

- CV[1] 26.90 MJ/kg;
- Ash 16.5%;
- Inherent Moisture 2.6%;
- Total Moisture 8.0%;
- Sulphur 0.70%;
- Volatile Matter 23.5%.

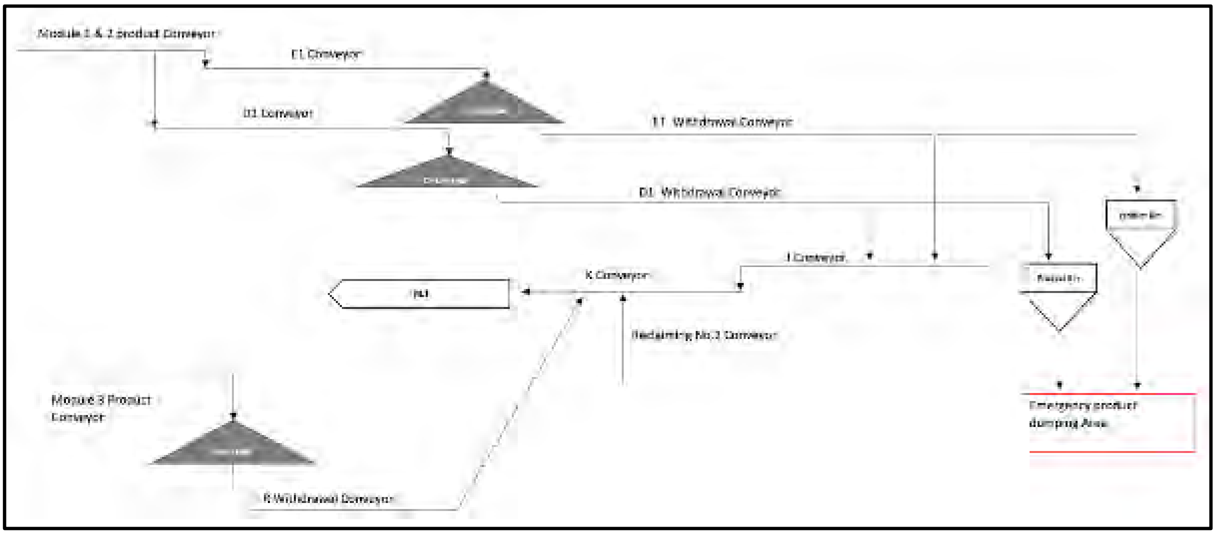
Middlings Product PRE (4 800NAR kcal/kg) Qualities:

- CV[1] 21.50 MJ/kg;
- Ash 28.0%;
- Sulphur 1.0%;
- Volatile Matter 21.0%.

In addition, some discards are sold raw and some PRE products are sold onto the domestic market as both sized products and duff.

Conveyor K is a conveyor that takes product from the Greenside plant to the shared RLT and is a potential bottleneck. Trucking of products to the RLT also takes place. The route of Conveyor K and the trucks is shown in Figure 10-20. Trucking is done by the independent contractors, Zizwe, who also do most of the loading and trucking on site. It is SRK's opinion that this should be avoided as it increases the cost.

Conveyor K and product stockpiles are shown in Figure 10-21. The ideal situation is that the AFE product transfers directly onto Conveyor K. There is a reasonable area for dumping of product, but this necessitates rehandling, which increases cost and can produce more fines in the product.



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Product Handling	Project No. 566644

Figure 10-19: No 4 Seam Product Handling

srk consulting	**GREENSIDE COLLIERY CPR** Greenside to Rail Load-out Conveyor and Truck Routes	Project No. 566644

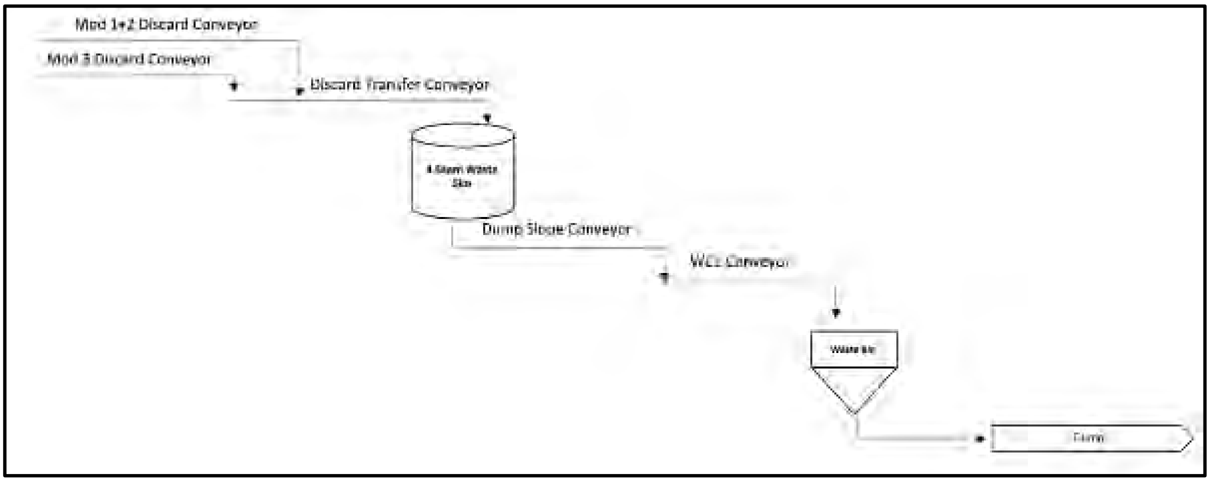
Figure 10-20: Greenside to Rail Load-out Conveyor and Truck Routes

srk consulting | **GREENSIDE COLLIERY CPR** Conveyor K and Product Stockpiles | Project No. 566644

Figure 10-21: Conveyor K and Product Stockpiles

Discard Handling

Discard coal from the No 4 Seam Plant is shown in Figure 10-22 and is joined by the No 5 Seam Plant discard material. They are conveyed to a discard bin from where Zizwe truck the material to its final position on the discard dump.



srk consulting | **GREENSIDE COLLIERY CPR** No 4 Seam Plant Discard Handling System | Project No. 566644

Figure 10-22: No 4 Seam Plant Discard Handling System

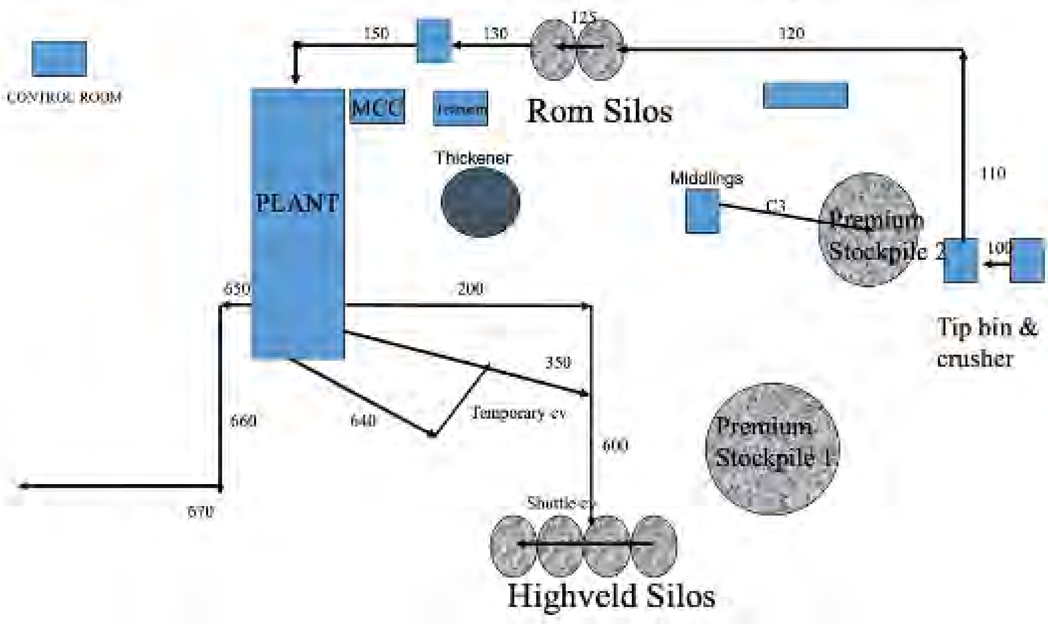
10.1.2. No 5 Seam Plant

The No 5 Seam plant is named after its previous purpose to wash No 5 Seam coal, which has since been depleted

(Figure 10-23). It is now fed from the existing discard plant. It has recently been upgraded and the flowsheet is shown in Figure 10-24. The general arrangement of the plant is shown in Figure 10-25.

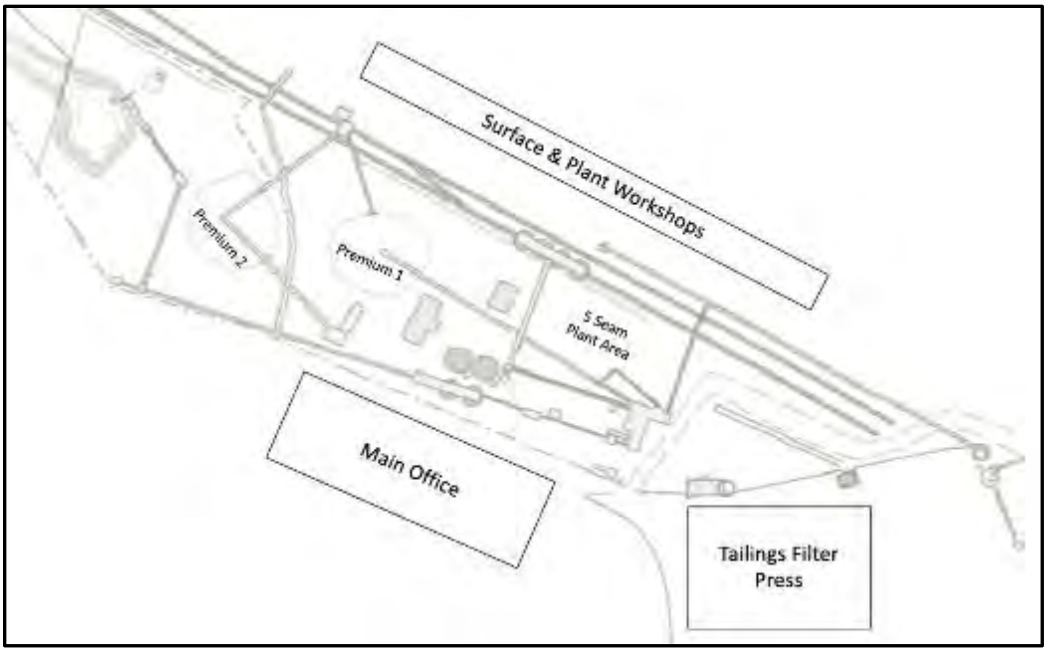
srk consulting	GREENSIDE COLLIERY CPR No 5 Seam Plant	Project No. 566644

Figure 10-23: No 5 Seam Plant



srk consulting	GREENSIDE COLLIERY CPR No 5 Seam Plant Flowsheet	Project No. 566644

Figure 10-24: No 5 Seam Plant Flowsheet



	GREENSIDE COLLIERY CPR No 5 Seam Plant Flowsheet	Project No. 566644

Figure 10-25: No 5 Seam Plant General Arrangement

The plant consists of 1 x 250 tph module which uses a conventional single stage 900 mm dense medium cyclone. Minus 1 mm material is treated in its own spiral plant. Ultrafines are treated in their own thickener and the underflow is pumped to the tailings filter presses.

The product is put onto its own stockpile where dewatered middlings from the No 4 Seam plant is also placed. The PRE coal can also be sent to silos for loading road trucks to the domestic market or it can be sent either to Conveyor K or to a stockpile next to the AFE stockpiles for later loading to the RLT.

The No 5 Seam Plant can be used to treat the discard mined from the existing discard dumps or it can be used to wash raw prime coal. If an increase in capacity is required to produce more AFE coal, then the washing of discard dumps can be delayed to a later time. However, its current purpose is to treat discard dumps as shown in Figure 10-26. Due to the nature of how the plants have been repurposed, the main problem in the plant complex is the amount of rehandling required.

srk consulting	**GREENSIDE COLLIERY CPR** Discard Dump Mining	Project No. 566644

Figure 10-26: Discard Dump Mining

10.2. Plant Design, Characteristics and Specification

SR5.3(iii)(iv), SR5.6(ii), SR6.3(iii)

The plant uses some unusual technologies, mostly because of the way the plant has evolved over time. The chance to increase yield by doing a wash for middlings coal could have added another module devoted to that task. However, TPCs were chosen with relatively minor other modifications required in the plant.

TPCs work by pumping one medium stream into the first vessel using a conventional mixing box to mix the feed and medium (Figure 10-27). The first stage is effectively a flat bottom cyclone (not a Larcodems), with the first stage float quality (AFE) being accurately controlled by the medium density chosen. The sinks from the first stage passes directly into the second stage, relying on the pressure from the first stage to set up the vortices within the cyclone (Figure 10-27b). However, the sinks outlet medium density will have shifted by some amount. Normally, a separate cyclone medium density would be set to produce the required middlings quality. But, with the TPC, it is not known what the medium density actually is, what the density shift is to determine the actual cut point in the second stage and whether that cut point is the correct density to produce the right quality or to maximise the yield in the second stage.

a) b)

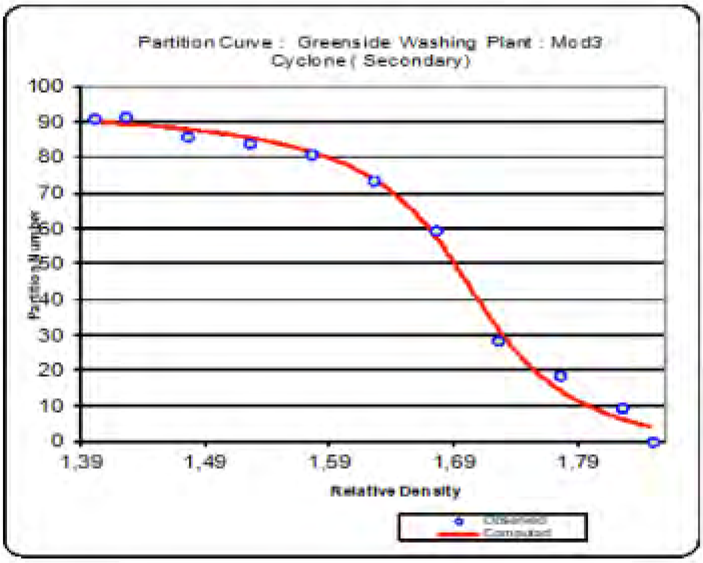
GREENSIDE COLLIERY CPR First Stage of Three Product Cyclone (TPC)	Project No. 566644

Figure 10-27: a) First Stage of TPC; b) Feed from First Stage Sinks into Second Stage of TPC

There is only one efficiency test available for inspection and it shows that the first stage works well and the second stage is very inefficient (Figure 10-28).

Efficiency Test Results	
Greenside Washing Plant Mod3 Cyclone (Secondary)	
Feed % Ash	50,4
Product % Ash	29,2
Discard % Ash	57,7
Product Yield	25,6
D50	1,690
EPM	0,0604
Org Eff	71,6
Sink in Float	5,46
Float in Sink	7,84
Total Misplaced	13,30
Near Dense Material *	31,63

* Percentage between +0,1 and -0,1 RD units from actual d50 cut-point



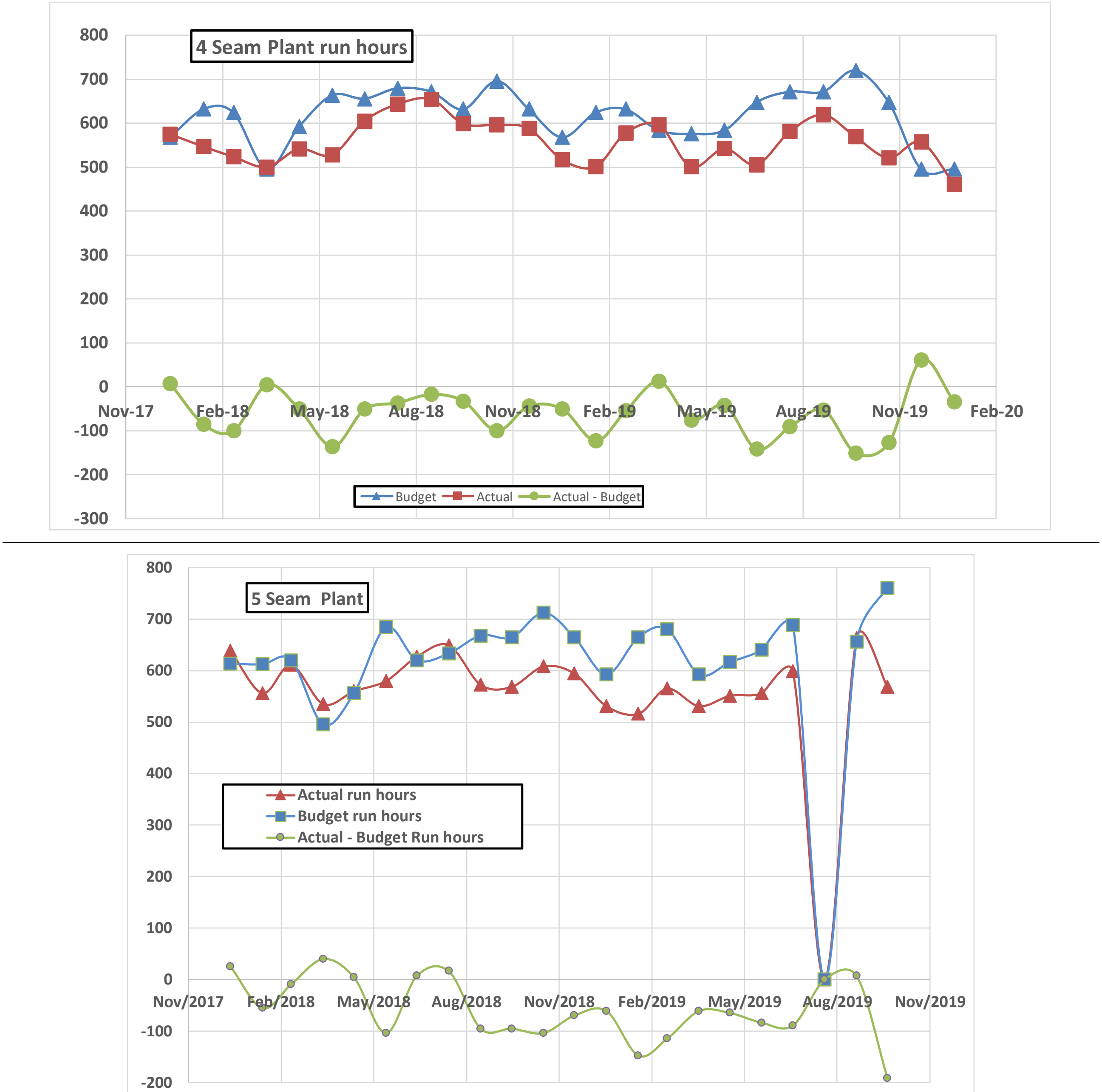
GREENSIDE COLLIERY CPR Efficiency Test on TPC Secondary Stage	Project No. 566644

Figure 10-28: Efficiency Test on TPC Secondary Stage

10.3. Plant Operating Hours

The No 4 Seam Plant run hours are good (Figure 10-29). There is a drive towards the plant running 150 hours per week, which equates to a run time of 89%.

The No 5 seam plant run hours are variable due to its mode of operation, as it depends on discard dump mining. The main downtime issues in 2019 relate to the plant upgrade, which happened while the plant was still working. However, the plant was commissioned in August 2019, as shown by no throughput for that month.



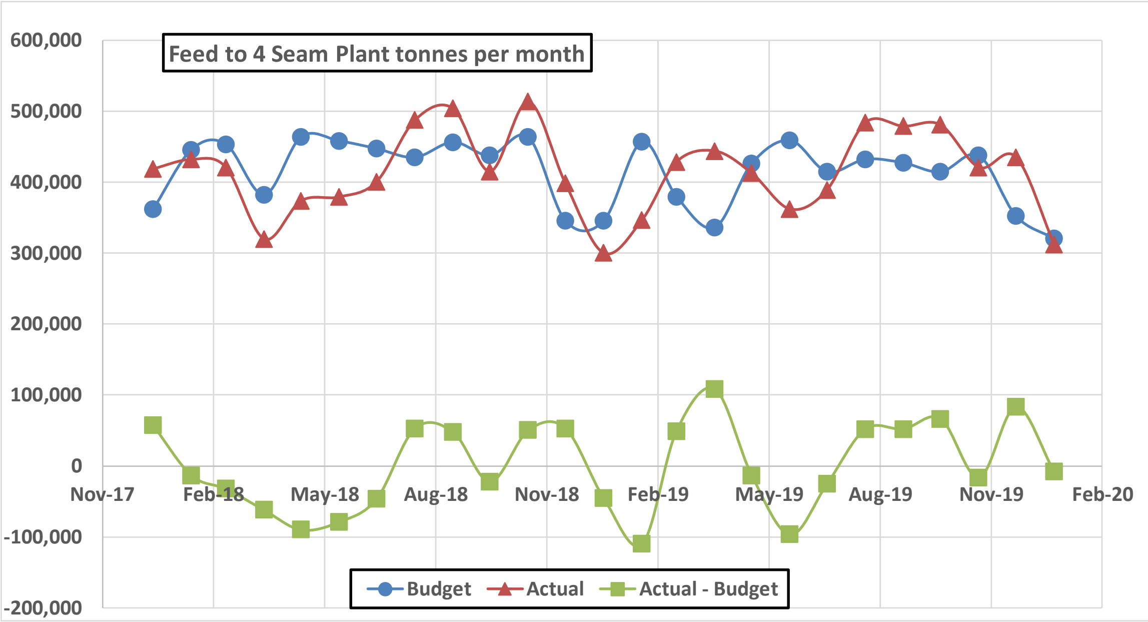
srk consulting	**GREENSIDE COLLIERY CPR** Run Hours – No 4 Seam Plant (top) and No 5 Seam Plant (bottom)	Project No. 566644

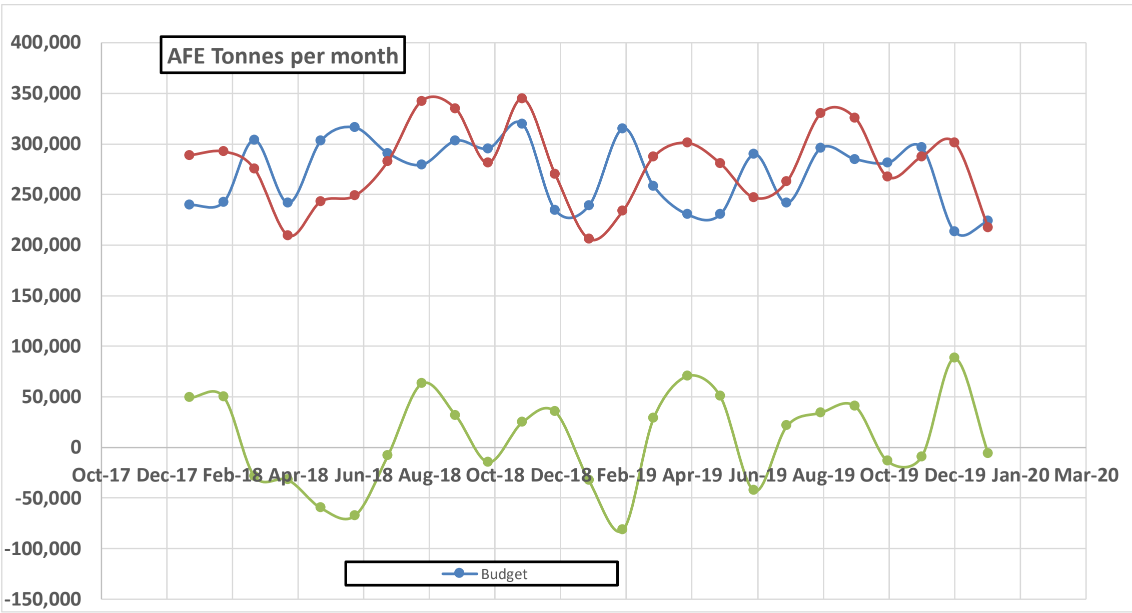
Figure 10-29: Run Hours – No 4 Seam Plant (top) and No 5 Seam Plant (bottom)

10.4. Plant Throughput Capacity

10.4.1. No 4 Seam Plant

Overall, the feed to plant tonnages are well on budget and AFE tonnages are slightly above budget (Figure 10-30).



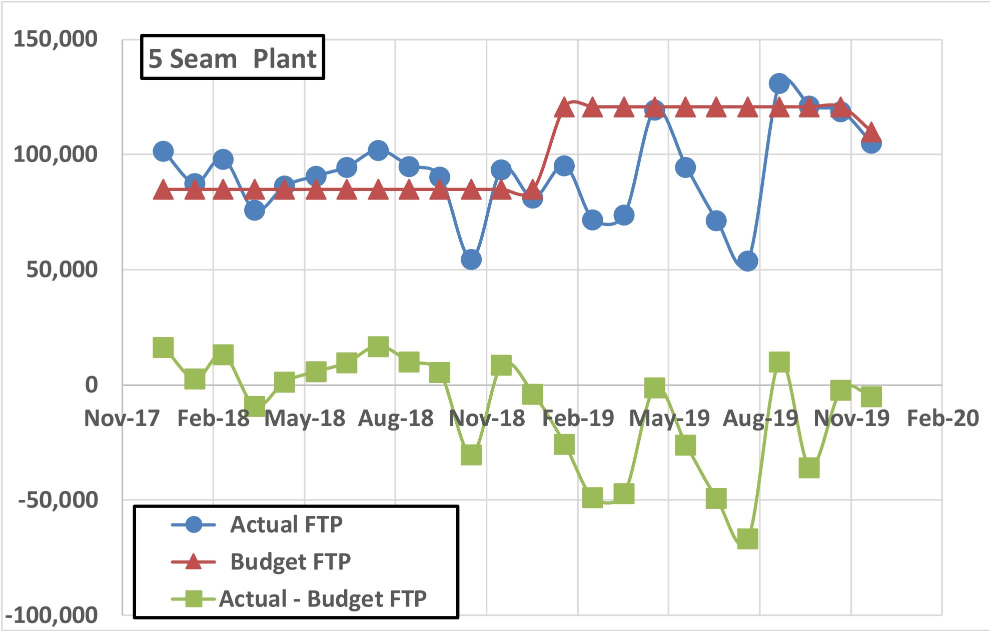


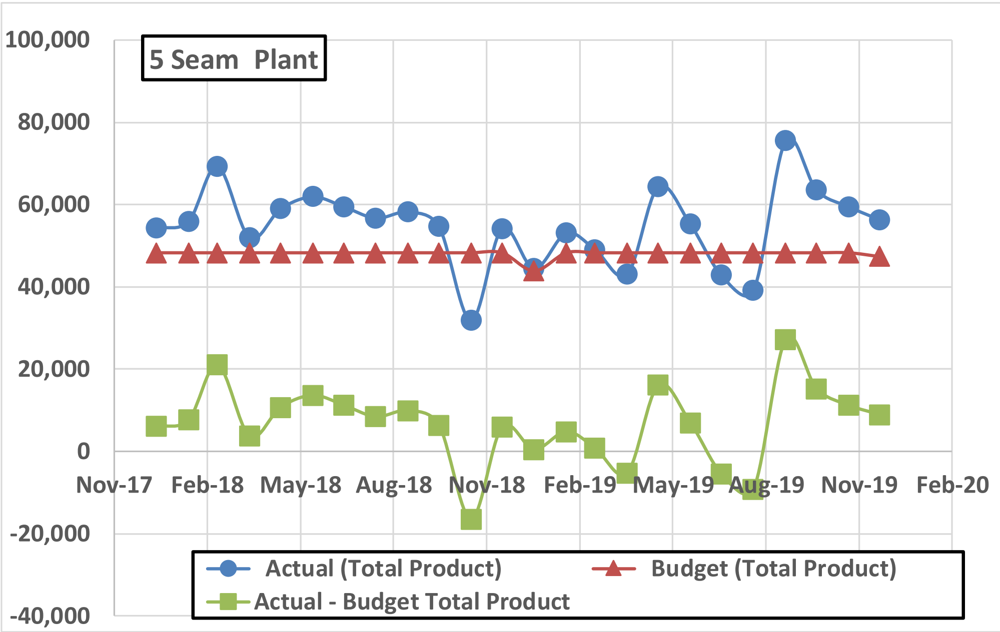
srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Plant – feed tonnes per month (top) and AFE production (bottom)	Project No. 566644

Figure 10-30: No 4 Seam Plant – feed tonnes per month (top) and AFE production (bottom)

10.4.2. No 5 Seam Plant

The No 5 Seam Plant has not kept up with the increase in budget feed to plant tonnes, but the higher yield has allowed the tonnes of PRE to be above budget (Figure 10-31).



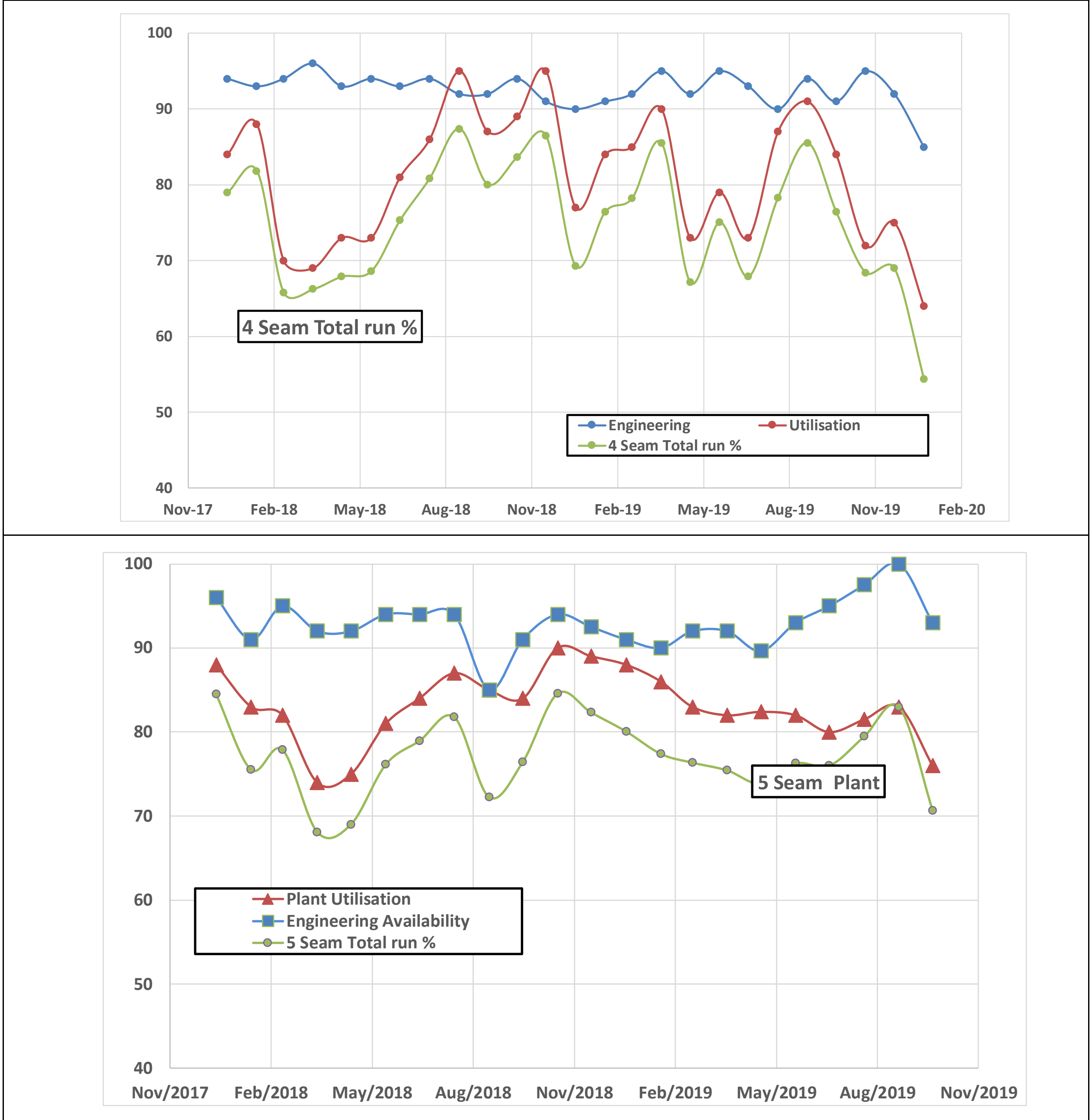


srk consulting	**GREENSIDE COLLIERY CPR** No 5 Seam Plant – Feed Tonnes per Month (top) and PRE Production (bottom)	Project No. 566644

Figure 10-31: No 5 Seam Plant – Feed Tonnes per Month (top) and PRE Production (bottom)

10.5. Plant Utilization

Both the No 4 Seam and No 5 Seam Plants run very high run hours (Figure 10-32). The engineering and operational downtimes are logged extremely well. At present, the absence of coal is the biggest element to lower run hours.



srk consulting	**GREENSIDE COLLIERY CPR** Run time % – No 4 Seam Plant (top) and No 5 Seam Plant (bottom) (Nov'17 to Feb'20)	Project No. 566644

Figure 10-32: Run time % – No 4 Seam Plant (top) and No 5 Seam Plant (bottom)

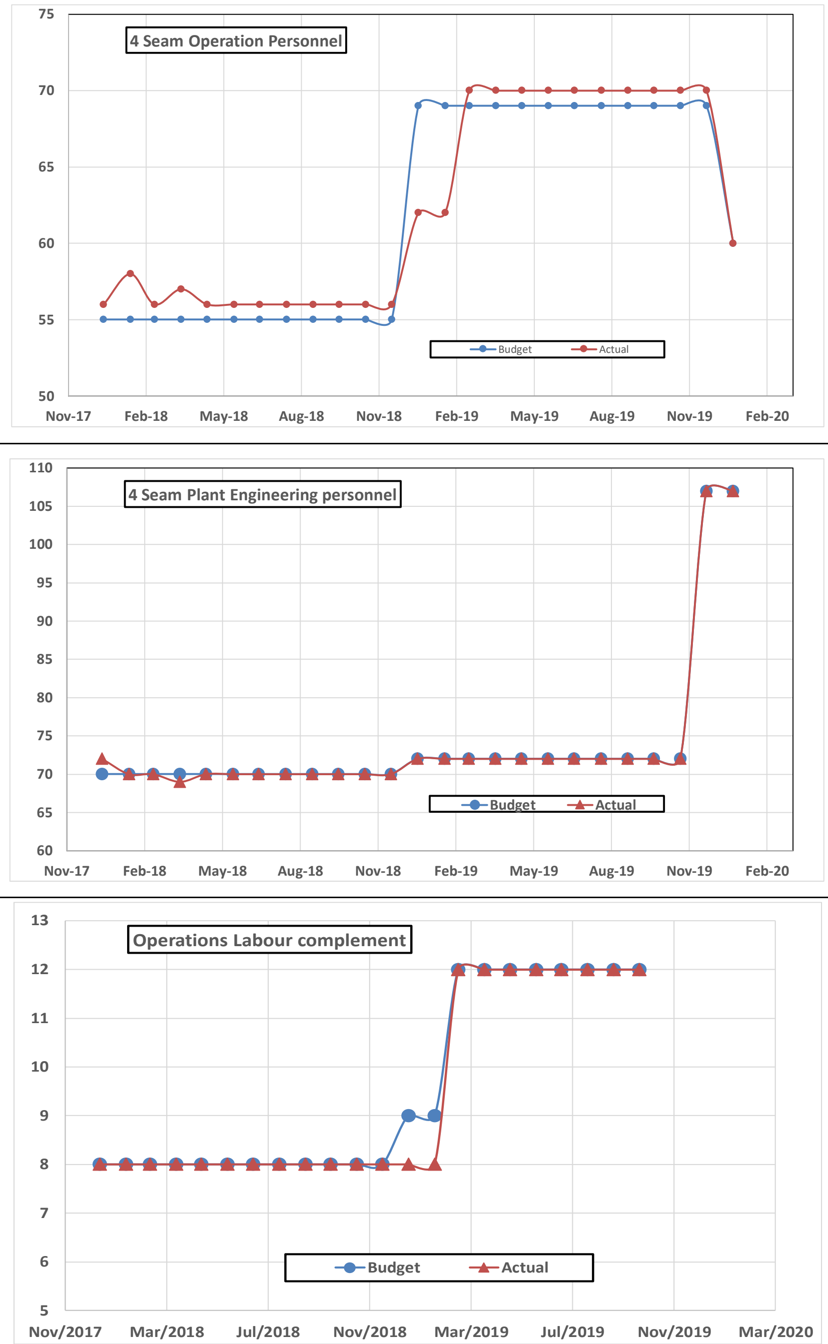
10.6. Manpower

[SR5.2(viii), SR5.3(iii)]

There are 15 operators per shift (Figure 10-33), supported by an engineering team, per plant:

- 1 x foreman;
- 1 x Central Control Room (**CCR**);
- 3 x No 5 Seam operators;
- 2 x laboratory; and
- 8 x No 4 Seam operators.

Both plants run 12-hour shifts using a 4-shift system as shown in Figure 10-34. This is an unusual arrangement but seems to be popular and works well as it gives regular longer breaks.



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Plant - Operating Personnel (top) and Engineering Staff (middle, same staff as for No 5 Seam Plant) No 5 Seam Plant – Operating Personnel (bottom)	Project No. 566644

Figure 10-33: No 4 Seam Plant - Operating Personnel (top) and Engineering staff (middle, same staff as for No 5 Seam Plant); No 5 Seam Plant – Operating Personnel (bottom)

D-Day Shift 06:00 - 18:00
N-Night Shift 18:00 - 06:00

A - T. Chiliza B - S. Moerane C - A. Coetzee D - D. Mokoena

Fulco shift roster 2020

Day	Jan	D	N	Feb	D	N	Mar	D	N	Apr	D	N	May	D	N	Jun	D	N	Jul	D	N	Aug	D	N	Sep	D	N	Oct	D	N	Nov	D	N	Dec	D	N
Tue																									01	a	c							01	d	a
Wed	01	b	c							01	b	a							01	c	d				02	a	b							02	d	c
Thu	02	b/d	c							02	b/c	a							02	a/c	d				03	a/d	b	01	a/d	b				03	b/d	c
Fri	03	b	d							03	c	b	01	c	b				03	a	c				04	d	a	02	d	a				04	b	d
Sat	04	a	b	01	a	b				04	d	c	02	d	c				04	b	a	01	b	a	05	c	d	03	c	d				05	a	b
Sun	05	a	b	02	a	b	01	a	b	05	d	c	03	d	c				05	b	a	02	b	a	06	c	d	04	c	d	01	c	d	06	a	b
Mon	06	a	d	03	a	d	02	a	d	06	d	b	04	d	b	01	d	b	06	b	c	03	b	c	07	c	a	05	c	a	02	c	a	07	a	d
Tue	07	b	d	04	b	d	03	b	d	07	c	b	05	c	b	02	c	b	07	a	c	04	a	c	08	d	a	06	d	a	03	d	a	08	b	d
Wed	08	b	a	05	b	a	04	b	a	08	c	d	06	c	d	03	c	d	08	a	b	05	a	b	09	d	c	07	d	c	04	d	c	09	b	a
Thu	09	b/c	a	06	b/c	a	05	b/c	a	09	a/c	d	07	a/c	d	04	a/c	d	09	a/d	b	06	a/d	b	10	b/d	c	08	b/d	c	05	b/d	c	10	b/c	a
Fri	10	c	b	07	c	b	06	c	b	10	a	c	08	a	c	05	a	c	10	d	a	07	d	a	11	b	d	09	b	d	06	b	d	11	c	b
Sat	11	d	c	08	d	c	07	d	c	11	b	a	09	b	a	06	b	a	11	c	d	08	c	d	12	a	b	10	a	b	07	a	b	12	d	c
Sun	12	d	c	09	d	c	08	d	c	12	b	a	10	b	a	07	b	a	12	c	d	09	c	d	13	a	b	11	a	b	08	a	b	13	d	c
Mon	13	d	b	10	d	b	09	d	b	13	b	c	11	b	c	08	b	c	13	c	a	10	c	a	14	a	d	12	a	d	09	a	d	14	d	b
Tue	14	c	b	11	c	b	10	c	b	14	a	c	12	a	c	09	a	c	14	d	a	11	d	a	15	b	d	13	b	d	10	b	d	15	c	b
Wed	15	c	d	12	c	d	11	c	d	15	a	b	13	a	b	10	a	b	15	d	c	12	d	c	16	b	a	14	b	a	11	b	a	16	c	d
Thu	16	a/c	d	13	a/c	d	12	a/c	d	16	a/d	b	14	a/d	b	11	a/d	b	16	b/d	c	13	b/d	c	17	b/c	a	15	b/c	a	12	b/c	a	17	a/c	d
Fri	17	a	c	14	a	c	13	a	c	17	d	a	15	d	a	12	d	a	17	b	d	14	b	d	18	c	b	16	c	b	13	c	b	18	a	c
Sat	18	b	a	15	b	a	14	b	a	18	c	d	16	c	d	13	c	d	18	a	b	15	a	b	19	d	c	17	d	c	14	d	c	19	b	a
Sun	19	b	a	16	b	a	15	b	a	19	c	d	17	c	d	14	c	d	19	a	b	16	a	b	20	d	c	18	d	c	15	d	c	20	b	a
Mon	20	b	c	17	b	c	16	b	c	20	c	a	18	c	a	15	c	a	20	a	d	17	a	d	21	d	b	19	d	b	16	d	b	21	b	c
Tue	21	a	c	18	a	c	17	a	c	21	d	a	19	d	a	16	d	a	21	b	d	18	b	d	22	c	b	20	c	b	17	c	b	22	a	c
Wed	22	a	b	19	a	b	18	a	b	22	d	c	20	d	c	17	d	c	22	b	a	19	b	a	23	c	d	21	c	d	18	c	d	23	a	b
Thu	23	a/d	b	20	a/d	b	19	a/d	b	23	b/d	c	21	b/d	c	18	b/d	c	23	b/c	a	20	b/c	a	24	a/c	d	22	a/c	d	19	a/c	d	24	a/d	b
Fri	24	d	a	21	d	a	20	d	a	24	b	d	22	b	d	19	b	d	24	c	b	21	c	b	25	a	c	23	a	c	20	a	c	25	d	a
Sat	25	c	d	22	c	d	21	c	d	25	a	b	23	a	b	20	a	b	25	d	c	22	d	c	26	b	a	24	b	a	21	b	a	26	c	d
Sun	26	c	d	23	c	d	22	c	d	26	a	b	24	a	b	21	a	b	26	d	c	23	d	c	27	b	a	25	b	a	22	b	a	27	c	d
Mon	27	c	a	24	c	a	23	c	a	27	a	d	25	a	d	22	a	d	27	d	b	24	d	b	28	b	c	26	b	c	23	b	c	28	c	a
Tue	28	d	a	25	d	a	24	d	a	28	b	d	26	b	d	23	b	d	28	c	b	25	c	b	29	a	c	27	a	c	24	a	c	29	d	a
Wed	29	d	c	26	d	c	25	d	c	29	b	a	27	b	a	24	b	a	29	c	d	26	c	d	30	a	b	28	a	b	25	a	b	30	d	c
Thu	30	b/d	c	27	b/d	c	26	b/d	c	30	b/c	a	28	b/c	a	25	b/c	a	30	a/c	d	27	a/c	d				29	a/d	b	26	a/d	b	31	b/d	c
Fri	31	b	d	28	b	d	27	b	d				29	c	b	26	c	b	31	a	c	28	a	c				30	d	a	27	d	a			
Sat				29	a	b	28	a	b				30	d	c	27	d	c				29	b	a				31	c	d	28	c	d			
Sun							29	a	b				31	d	c	28	d	c				30	b	a							29	c	d			
Mon							30	a	d							29	d	b				31	b	c							30	c	a			
Tue							31	b	d							30	c	b																		
Wed																																				

srk consulting

GREENSIDE COLLIERY CPR
Coal Washing Plant Fullco Shift Roster

Project No.
566644

Figure 10-34: Coal Washing Plant Fullco Shift Roster

10.7. Quality Control

SR6.3(iii)

The plant has many automatic samplers on the products and discards (Figure 10-35). However, there is very little sampling of feed coal.

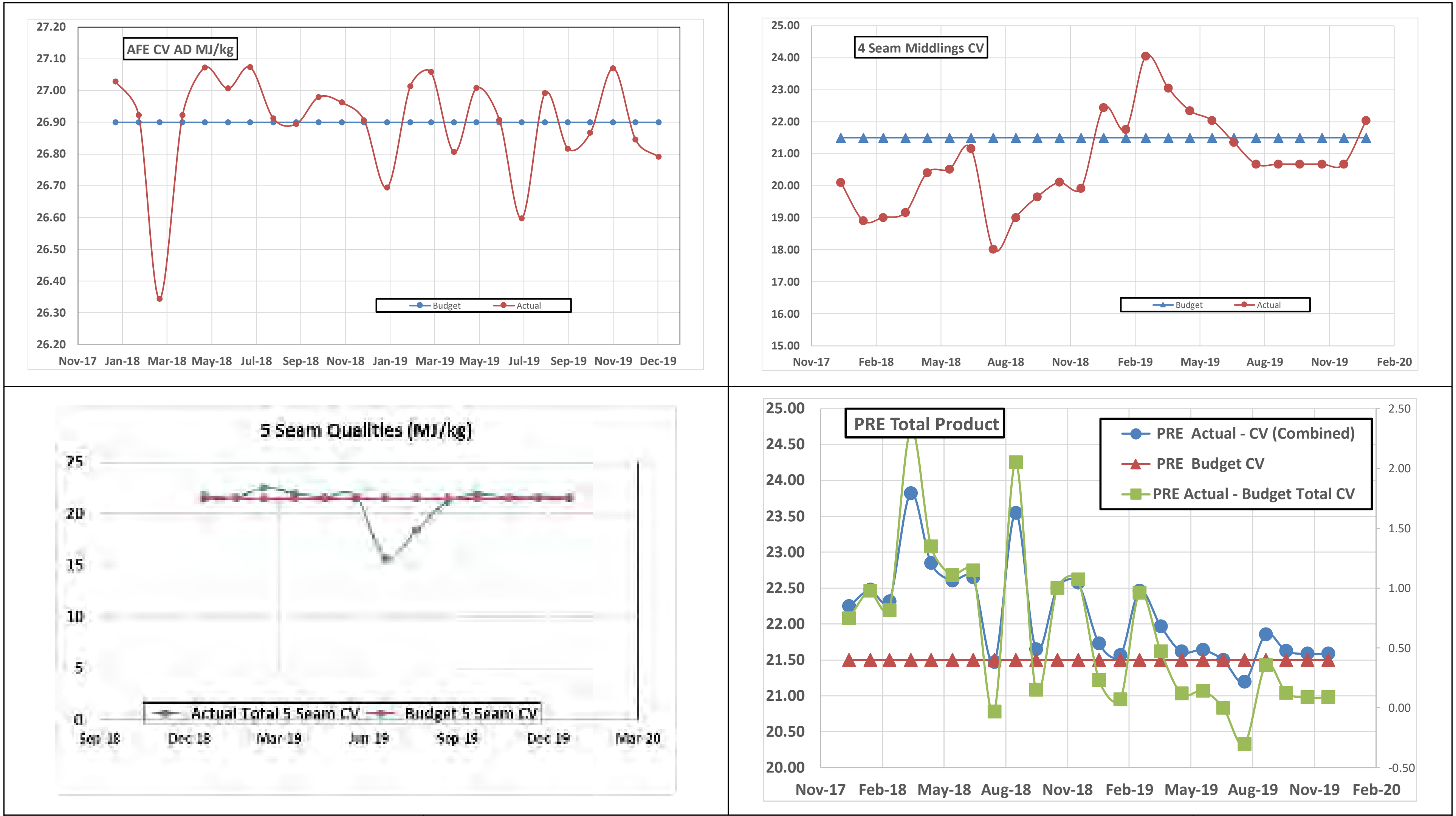
srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Plant Product and Discard Automatic Samplers	Project No. 566644

Figure 10-35: No 4 Seam Plant Product and Discard Automatic Samplers

It is planned that over time AFE product qualities will drop from 5 850 kcal/kg to 5 500 kcal/kg. Twice each year, the best quality, based on mining horizon, yield and prices, is determined by the mine and the Company's marketing team. In addition, various products are sold, particularly sized coal into the domestic market and some raw coal.

Generally, the product quality coal is reasonable and varies based on the feed coal. The flotation product is not recorded but might account for the quality fluctuations.

The No 4 Seam middlings quality is variable and this is probably due to the lack of control of the second stage of the TPCs (Figure 10-36). The No 5 Seam product is generally consistent and overall, the total PRE product is a combination of the problems.



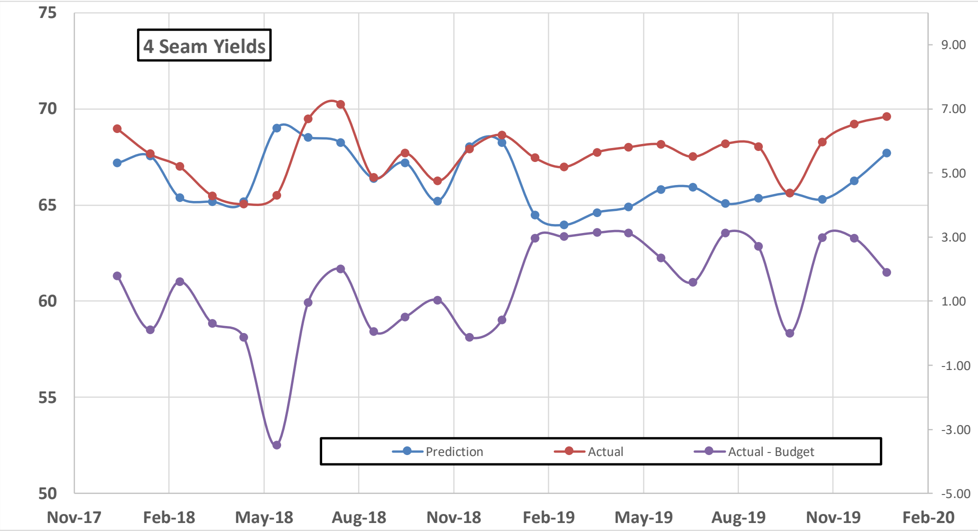
srk consulting	**GREENSIDE COLLIERY CPR** Quality Control – No 4 Seam AFE and Middlings CVs (top), No 5 Seam Product and Overall PRE CVs (bottom)	Project No. 566644

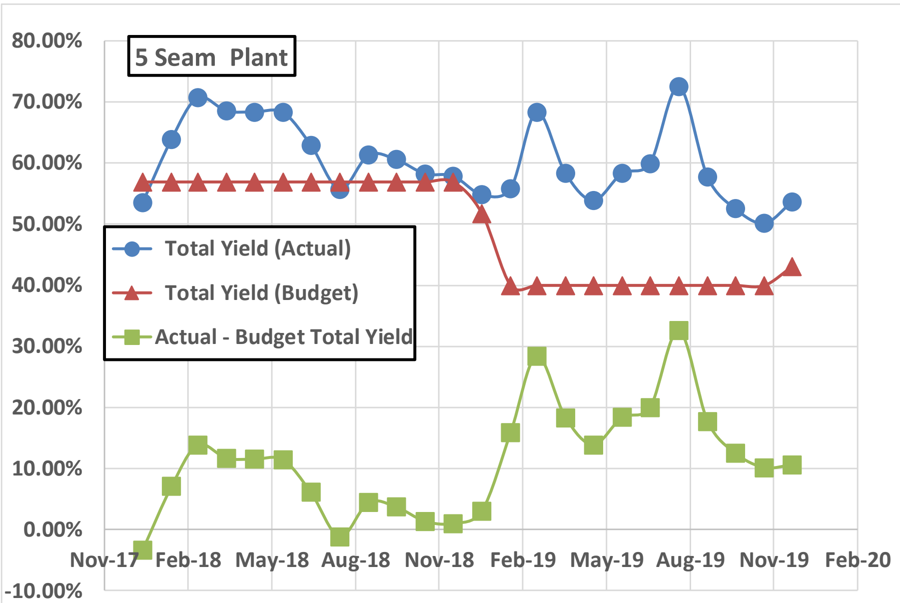
Figure 10-36: Quality Control – No 4 Seam AFE and Middlings CVs (top), No 5 Seam Product and Overall PRE CVs (bottom)

10.8. Plant Yields

The No 4 Seam yield is, on average, slightly over the yield predicted from the mine plan (Figure 10-37).

The No 5 Seam yields are over budget yield and this probably reflects the difficulty of determining the type of coal that is being fed to the plant.





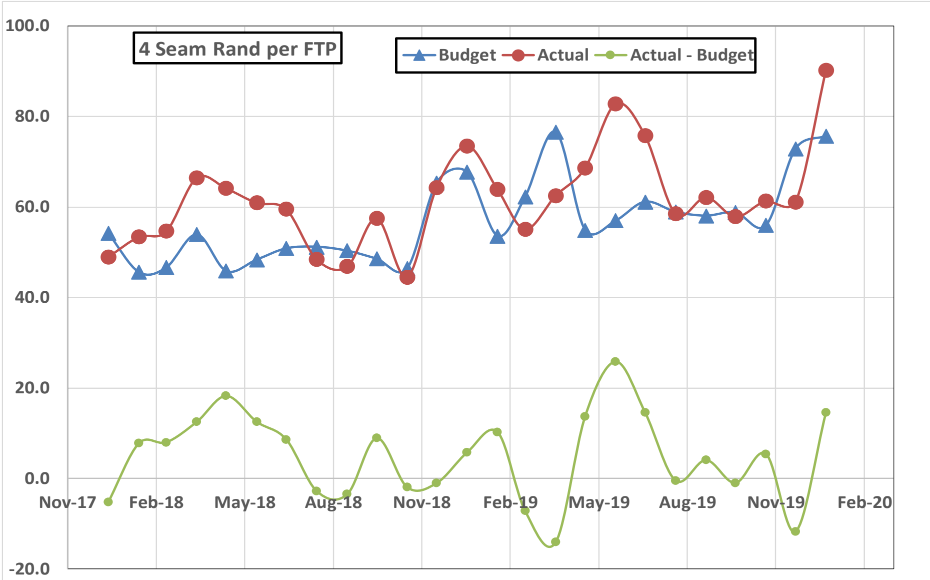
srk consulting	GREENSIDE COLLIERY CPR AFE Yields – No 4 Seam Plant (top) and No 5 Seam Plant (bottom)	Project No. 566644

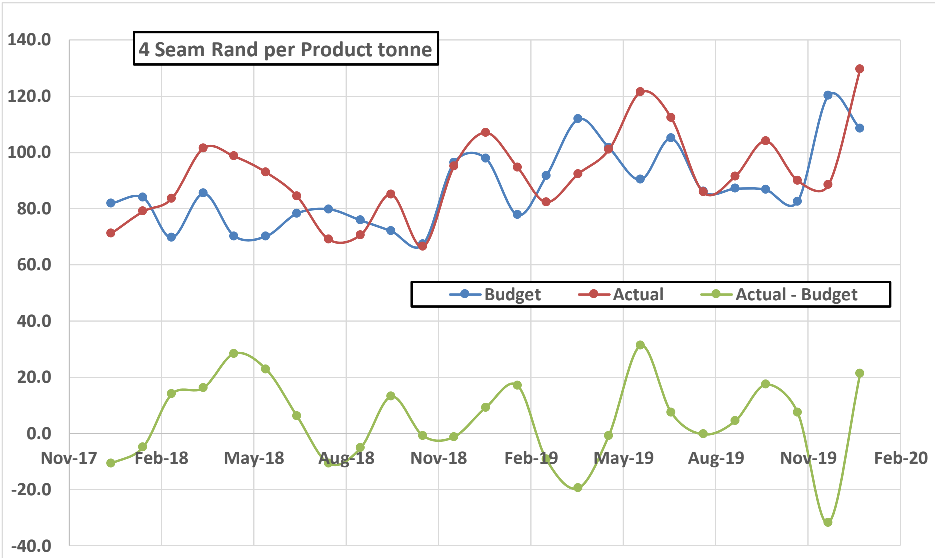
Figure 10-37: AFE Yields – No 4 Seam Plant (top) and No 5 Seam Plant (bottom)

10.9. Plant Accounting

10.9.1. 4 Seam Plant

The No 4 Seam Plant costs are slightly higher than budget on a feed to plant basis, but because of higher yields the cost per saleable tonne is reasonably in line (Figure 10-38).



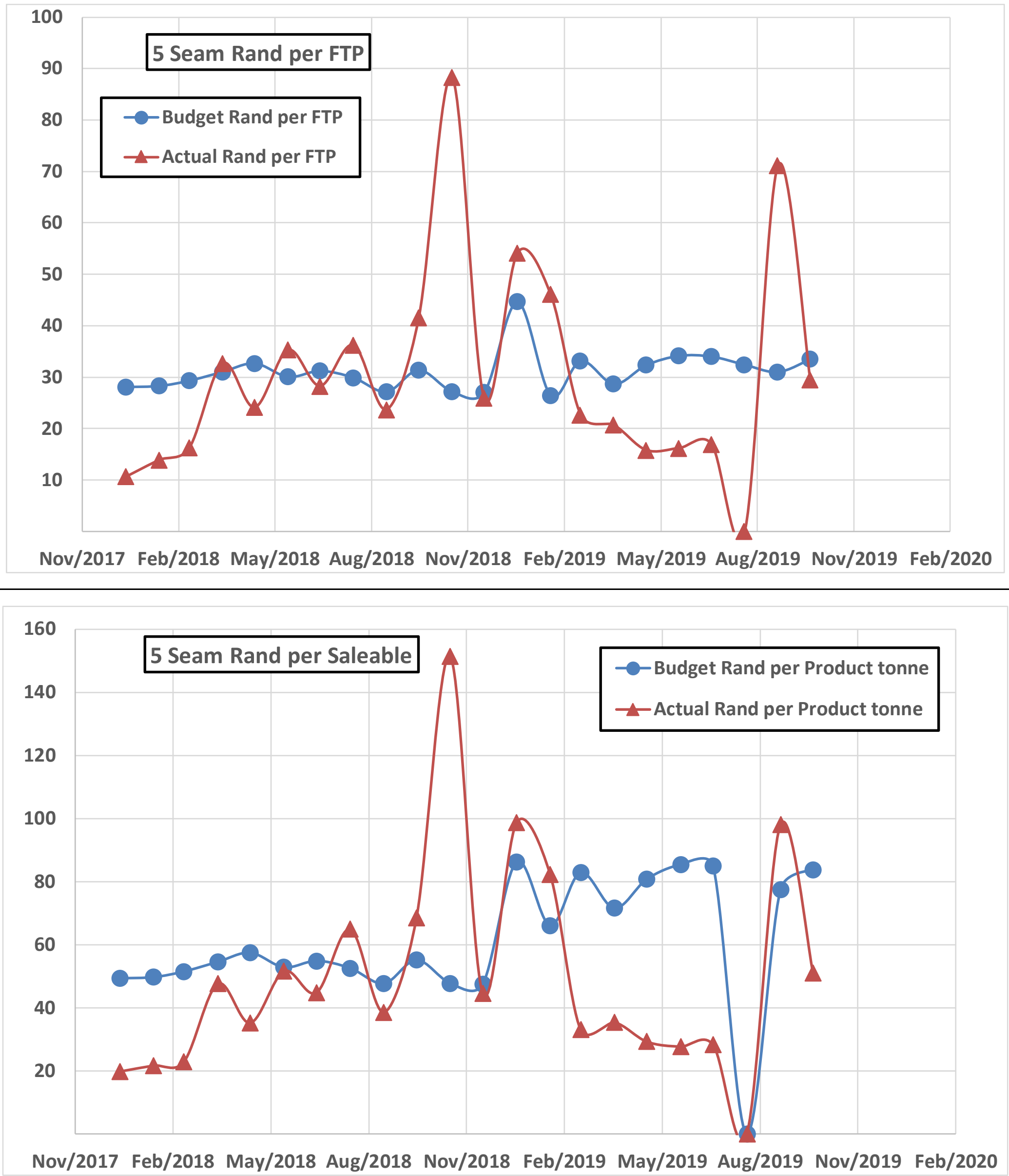


srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam unit costs per feed tonne (top) and product tonne (bottom)	Project No. 566644

Figure 10-38: No 4 Seam unit costs per feed tonne (top) and product tonne (bottom)

10.9.2. 5 Seam Plant

The No 5 Seam Plant costs are slightly higher than budget on a feed to plant basis, but because of higher yields the cost per saleable tonne is reasonably in line (Figure 10-39). Spikes in costs are due to specific extra engineering costs not capitalised.



srk consulting	**GREENSIDE COLLIERY CPR** No 5 Seam unit costs per FTP (top) and product tonne (bottom)	Project No. 566644

Figure 10-39: No 5 Seam unit costs per FTP (top) and product tonne (bottom)

10.10. Plant Condition

Recent updates have been made to both plants.

The plants are generally well maintained and in reasonable condition considering the age of some of the plant.

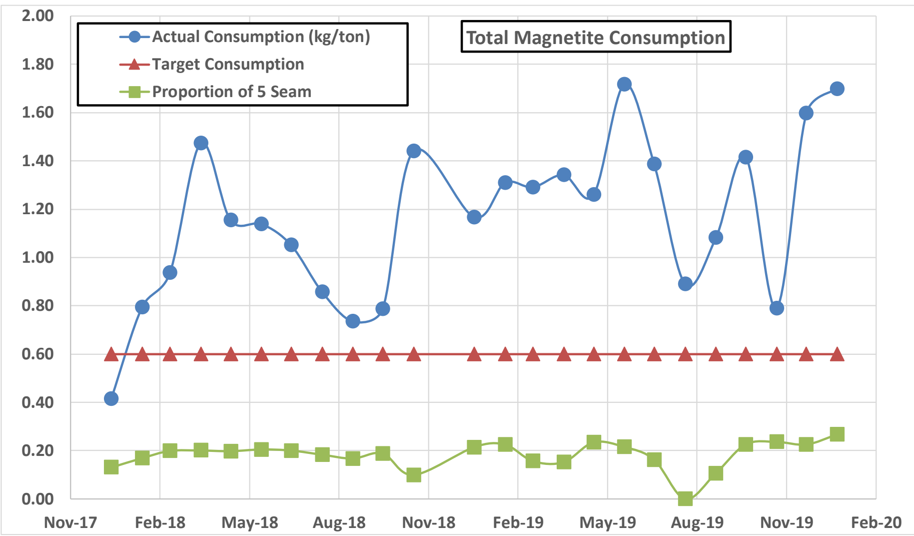
10.11. Plant Capital Expenditure

There is no capital in the budget for new processing capability.

10.12. Projected Requirements for Energy, Water and Process Materials

Water is abundant and is of good quality, pH 8. The use of flotation product and tailings and No 5 Seam thickener underflow means that the water consumption is considerably lowered and that slurry ponds are minimized. There is only one water balance available, but the duration of measurements and dates are unknown.

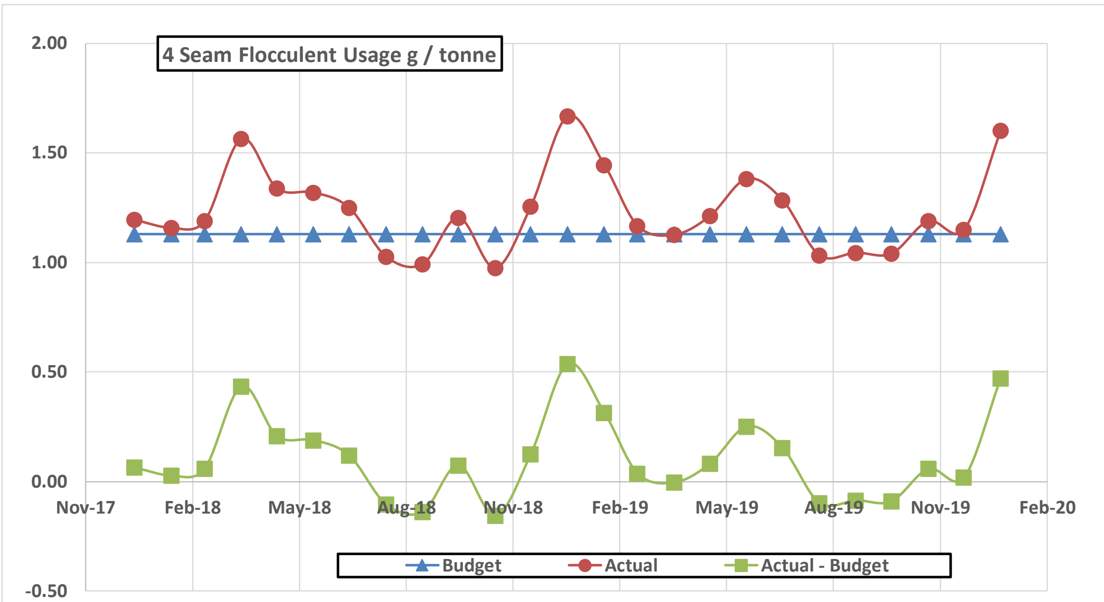
Magnetite is supplied by bulk trucks from Martin & Robson via Broodsnyersplaats siding, so supply is reliable under normal circumstances. The quality is standard, 90% -45 micron. The consumption, as shown in Figure 10-40, is high. A plant similar to this should be using approximately 1 kg/t However, the No 5 Seam Plant is primarily treating discard material which is generally much finer than primary mined feed. This would cause more magnetite to be used. The graph shows a vague relationship between the overall consumption and the proportion of No 5 Seam feed to the overall.



srk consulting	**GREENSIDE COLLIERY CPR** Total Magnetite Consumption	Project No. 566644

Figure 10-40: Total Magnetite Consumption

The flotation plant reports no numbers for consumption of reagents, only a flat 0.3 l/t of frother and 1.2 l/ of collector. The total flocculent consumption is shown in Figure 10-41.



srk consulting	**GREENSIDE COLLIERY CPR** No 4 Seam Plant Flocculent Consumption	Project No. 566644

Figure 10-41: No 4 Seam Plant Flocculent Consumption

10.13. Specific Coal Processing Risks

[12.10(h)(x)] [SR5.7(i)]

The plant is well established and has probably already met any challenges that may arise.

The plants, however, rely on Conveyor K and the operation of the RLT. If any disruption of the export coal line occurs because of sabotage, catastrophic line failure et al, then the wash plants and the mine would stop once the stockpiles are full (including the open stockpiles that can be reclaimed by double handling).

The supply of magnetite is vital for the operation as the plants cannot run without an adequate supply. Disruption is unlikely, but the vast magnetite stocks at Phalaborwa are presently being exported at a high rate to China via the Richards Bay Bulk Cargo system.

11. Coal Discard Storage Facilities

[SR1.1(ii), SR5.4(ii)]

11.1. Current and Future Coal Discard Production

The total amount of mixed discards (combined filtered fine coal discards and coarse coal discards) placed on the Greenside Discard Facility from August 2014 until December 2018 is 8.95 Mt (based on the Isithelo Mining Products and Services dated 2018). The total mixed discards planned for deposition from end of 2018 until LoM (2026) is 11.58 Mt.

11.2. Current Coal Discard Facility Infrastructure and Operations

11.2.1. Greenside Discard Facility Management

The Discard Facility is operated and managed by the Mine, Zizwe Bulkmech (Operator) and Isithelo Technical Solutions (Pty) Ltd (Engineer of Record), to ensure the design and integrity of the Discard Facility is maintained.

11.2.2. Greenside Discard Facility Infrastructure

The Discard Facility consists of the following infrastructure:

- Coarse discards delivery conveyor and a discards silo. Haul trucks deliver the coarse coal discards to the facility;
- Fine coal discards delivery - a filtration plant is used to generate fine coal slurry as a filter cake which is mixed with the coarse coal discards in the deposition areas;
- Coarse discards deposition areas – where coarse coal discard is deposited together with the filter cake fine coal. This is compacted to prevent spontaneous combustion; and
- Penstock – previously used for decanting supernatant water from the slurry pool. The penstock generally no longer utilized as minimal slurry is deposited on the slurry compartment.

11.2.3. Greenside Discard Facility Dirty Water Management

Dirty water management is controlled by:

- Discard Facility Return Water Dam – a High-density polyethylene (**HDPE**) lined dam with a capacity of 100 000 m³, constructed and commissioned in 2012. Collects toe seepage and stormwater runoff from the southern side of the Greenside Discard Facility, water abstracted from underground No 2 Seam and water pumped from Dam 3;
- Lake Lucy – 24 000 m³ capacity. Unlined dam, part of old facility design. Collects storm water run-off from the coal handling process plant and toe seepage from a portion of the northern area of the Greenside Discard Facility;
- Y2K dam – Unlined dam, part of old facility design. Capacity of 10 000 m³ and receives overflow from Lake Lucy and general runoff beyond Lake Lucy; and
- Dam 3 – also known as Bottom Dam. Unlined dam with a capacity of 40 000 m³. Caters for storm water runoff and toe seepage from a portion of the northern area in the east and west of the Greenside Discard Facility.

Storm water runoff from the Greenside Discard Facility is managed by a combination of all the above facilities.

11.2.4. Greenside Coal Discard Facility and Co-disposal Discard Deposition

Deposition is by means of mixed discards disposal where wet slurry is filtered through the filtration plant and filtered fines are mechanically placed on the Discard Facility. The filtered fines are mixed, spread and compacted together with coarse discards on the deposition area.

11.3. Current Legal Requirements/Obligations

11.3.1. Legal Appointments

The Engineer of Record is Isithelo Technical Solutions (Pty) Ltd. The Contractor responsible for the Coal and Discard Disposal is Zizwe Opencast Mining.

11.3.2. Monthly Monitoring

Gas, Temperature, Density and Void Tests

Monthly monitoring of discard Gas, Temperature, Density and Void tests is conducted. Generally, these are found to be within acceptable limits.

Topographical Survey Monitoring

Bi-Annual and monthly topographical surveys are conducted of the Discard Facility to monitor the following:

- Coarse discards / mixed discards deposition area and elevations;
- Topsoil stripping and cladding;
- Elevation of discards around slurry compartment;
- Freeboard; and
- Penstock and water levels.

The monthly reports are used to review operations and ensure that the Discard Facility is operated in a safe and environmentally acceptable manner. The results generally indicate that these aspects are proceeding in accordance with the design and operational requirements for fines and coal discard disposal.

11.3.3. Quarterly Audits

The results of the quarterly audit inspections are discussed in a meeting where minutes are taken, and actions and due dates recorded for corrective action.

11.3.4. Annual Audit and Current Inspection

The annual 2018 audit inspection report prepared by Isithelo Technical Solutions (Pty) Ltd (**Isithelo**) was available for review. This report reviews the design and operation criteria information and covers visual inspections and surveillance. SRK has included comments from this annual audit and from the current inspection in this section. The following findings were made in the 2018 audit inspection (Isithelo, 2019a):

- Erosion gulley repair required of the East village area according to the annual 2018 audit inspection report;
- Disrepair of the penstock decant structure. SRK – the decant structure and associated catwalk/working platform appeared to be in reasonable condition at the time of the site inspection;
- Acceptable slurry compartment water/pool. SRK – there was no pool at the time of the SRK site inspection;
- Acceptable phreatic surface according to the annual 2018 audit inspection report;
- Freeboard performance in December 2018 acceptable. SRK – visually, the freeboard appears non-compliant. The most recent freeboard survey indicates the highest at 4.41 m and lowest at 1.02 m;
- Acceptable coarse discard compaction. SRK - The November 2019 testing report indicates the minimum required *in situ* bulk density of 1 600 kg/m3 is being achieved;
- Slope control and shaping required according to design in the Phase 4 area according to the annual 2018 audit inspection report;
- Access roads and berms around Lake Lucy, compaction and filling required according to the annual 2018

audit inspection report;

- Fence at Lake Lucy is in disrepair according to the annual 2018 audit inspection report;
- Toe trenches on southern Discard Facility near the highway require removal of silt and debris. SRK – this is still required to be done. These trenches must be cleaned of silt, debris and vegetation to enable the drain to function effectively;
- Lake Lucy silt trap is silted and requires cleaning. SRK did not visually inspect the silt trap;
- New Return Water Dam:
  - Minimum water level required to protect HDPE liner from ultra-violet damage. SRK – this is still non-compliant;
  - Bushes around the Return Water Dam (**RWD**) to be removed, risk of fire and damaging HDPE. SRK – this is compliant; and
  - Safety nets at the edge of the RWD need to be moved back into the basin of the RWD. SRK – this is still non-compliant.
- Seepage – no areas of significant seepage noted according to the annual 2018 audit inspection report; and
- Acceptable housekeeping practices.

The following comments are made from the current inspection:

- Re-mined areas provide additional air space on the co-disposal discard dump for the LoM. A reduction in the demand for coal can potentially reduce this airspace. SRK understands that a study is currently under way to confirm sufficient airspace at the co-disposal discard dump for LoM;
- Coarse discard is being compacted to the minimum target dry density of 1 600 kg/m^3, according to the November 2019 testing report. Where this is not achieved there is a risk of spontaneous combustion;
- Discard area berms - berms surrounding discard areas have low spots. Top of discard areas slope toward these berms that have low spots that are insufficient height for effective freeboard. Overtopping may occur during storm events resulting in erosion of slopes;
- Discard dumps stormwater drainage – there is no formalised control of stormwater off the discard areas to mitigate erosion of discard dumps surfaces and slopes;
- Re-mining areas – the mine plan to be revised in accordance with re-mining areas to prevent uncontrolled erosion down gradient;
- Slurry dam - low spots where berms are insufficient height for effective freeboard will result in overtopping by stormwater and erosion of slurry dam slopes and potentially failure of slurry dam slopes; and
- Discard Facility toe trenches - toe trenches on southern Discard Facility effectiveness reduced due to silt and debris build-up and vegetation growth, causing a build-up of water and potentially affecting the stability of the toe and slope.

11.3.5. Consequence Classification of Structure (CCS)

The Greenside Discard Facility and New Tailings Dam were classified with a CCS rating of Major during a workshop held on 12 October 2016 (Isithelo, 2017). A risk rating was also conducted for comparison with the CCS rating, to assess the likelihood of a failure mode occurring. When the likelihood of failure (slope failure) is incorporated, a Major CCS rating still shows significant risk. According to the information made available to SRK, the following studies are still required for evaluating the Discard Facility and New Tailings Dam structures:

- Dam break analysis; and
- Stability analyses:

  - Static analysis;
  - Pseudo-static analysis; and
  - Dynamic analysis.

In addition to the above requirements, structures with a CCS rating of Major must have a suitably qualified competent person permanently on site. SRK understands that there is such a person who is shared with a nearby facility.

11.3.6. Slope Stability Assessments

Discard Facility slope stability assessments were done in June 2019 (Isithelo, 2019b), for the slurry compartment near to the highway and the risk of localised failures on the lower embankment of this slope. There is a very low risk of catastrophic failure of the slope and a very low risk of catastrophic failure on the lower embankment portion of the slope. Operational risk associated with the inner slopes of the slurry compartment were determined to have a low risk of failure with the probability of failure close to zero.

The current stability risk of the slurry compartment is likely to be similar to the June 2019 assessment, as a water pool is not currently present. This should however be confirmed by analysis.

11.4. Future Legal Requirements/Obligations

The future legal requirements/obligations for the Discard Facility are to continue with the current requirements, which are:

- Legal Appointments;
- Monthly Monitoring, which should include:
  - Gas, Temperature, Density and Void tests; and
  - Topographical Survey Monitoring of the following:
    - Coarse discards / mixed discards deposition area and elevations;
    - Topsoil stripping and cladding;
    - Elevation of discards around slurry compartment;
    - Freeboard; and
    - Penstock and water levels;
- Quarterly Audits;
- Annual Audits; and
- Slope Stability Assessments.

11.5. Future Coal Discard Disposal Infrastructure Requirements

Based on the volumetric airspace modelling and the production forecast, the mixed discards disposal capacity will be depleted on or about November 2021 in the two main deposition areas. This duration does not account for airspace capacity made available through *in situ* coarse discards mining activities conducted since end of 2016. It is understood that a study is underway to incorporate the airspace capacity made available by *in situ* coarse discards mining and determine the true airspace capacity available on the Greenside Discard Facility. SRK has not seen the results of this study.

11.6. Coal Discard Disposal Closure Plans

The Mine closure objectives are outlined in the WSP (2014) report Aligned Environmental Management Programme Report, Anglo American Thermal Coal: Greenside Colliery DMRE Reference: MP30/5/1/2/2/304MR date 23 March 2014.

The remaining residue deposits after mine closure will be rendered stable with a self-sustaining vegetation cover. A minimum topsoil cover of 250 to 300 mm to be provided for vegetation establishment.

The costs estimated the Discard Facilities closure in 2014 when the study was conducted was R83 million.

SRK recommends that berms are constructed at the crests of the Discard Facility slopes to prevent erosion of the slopes.

11.7. Summary of Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

The summary of risks identified by SRK during the inspection of the Discard Facility is provided:

- Additional air space provided by re-mining may be reduced should the re-mining operation be slowed down or stopped as a result of a decline in the coal demand. A study is under way to determine the available airspace at the co-disposal discard dump for LoM;
- Where coarse discard is not compacted to the minimum target dry density of 1 600 kg/m^3, spontaneous combustion of the discard may occur;
- Discard area berms have low spots that are insufficient height for effective freeboard. Overtopping may occur during storm events resulting in erosion of slopes;
- There is no formalised control of stormwater for drainage off discard areas, to mitigate erosion of discard dumps surfaces and slopes;
- The mine plan to be revised in accordance with re-mining areas to prevent uncontrolled erosion down gradient;
- Low spots in slurry dam berms are insufficient height for effective freeboard and may result in overtopping by stormwater and erosion of slurry dam slopes and potentially failure of slurry dam slopes;
- Discard Facility toe trenches effectiveness on the southern Discard Facility reduced due to silt and debris build-up and vegetation growth. This may potentially affect the stability of the toe and slope;
- The New Return Water Dam minimum water level must be kept compliant to prevent ultra-violet damage to the HDPE liner; and
- Safety nets in the New Return Water Dam to be moved back into the basin so as to be effective.

The following opportunity is provided:

- The CCS rating of the Discard Facility and New Tailings Dam classifies as Major, and the following studies are still required:
  - Dam break analysis; and
  - Stability analysis (static, pseudo-static and dynamic analyses).

12. Infrastructure and Engineering

[SR1.1(ii), SR4.3(ii), SR5.4(i)(ii), SR5.6(viii)] [SV1.5]

12.1. Introduction and Background

SRK mechanical and electrical engineers visited Greenside on 28 November 2019. The areas visited were:

- Technical services office complex;
- Change house;
- Drive through the coal washing plant;
- LDV, electrical and trailing cable workshops; and
- Thandeka underground mining section.

A second site visit was conducted by Mr K Mahuma of SRK on 09 December 2019 to discuss and review in detail the maintenance management systems employed by Greenside, whereby the reliability engineer together with the senior maintenance planner were interviewed and presentations on the maintenance management system were made by these Greenside personnel. A representative from the works management department was also interviewed during this visit.

The mine's surface infrastructure is shown in Figure 12-1, Figure 12-2 and Figure 12-3.

12.2. Mechanical Infrastructure

Greenside is a mature colliery with all the necessary infrastructure and facilities to run a safe and efficient mining and coal washing operation. The surface complex has poplar-lined tar roads, with well-maintained lawn and garden areas.

12.2.1. Main Offices, Training Centre and Stores

Buildings and structures are generally old but originally well designed and built. The buildings are well maintained and have been renovated to various degrees as required. Visual inspection of offices, training centre stores and surrounding areas gave an impression that these buildings are well looked after. Although many new conveyor belts are kept in the open store area, these belts are wrapped in protective covers. The CTC provides training for the group's coal mines.

12.2.2. Workshops

The LDV workshop, electrical workshop, trailing cable repair workshop and boiler making workshop all appeared to be adequate for the size of equipment to be maintained.

The diesel workshop did not have enough space and is only equipped with one overhead crane. However, three additional parking facilities for LHDs were being constructed at the time of the visit. Information received from the mine in October 2020 is that the construction of additional parking facilities has since been completed and that these are now in use.

The plant workshops are correctly sized, however with some interior illumination issues. SRK is of the opinion that this is due to the dark grey colour paint that was used to paint the workshop's interior walls. It is recommended that a lighter colour paint (preferably white) be used to improve the illumination levels inside the plant workshops.

srk consulting	**GREENSIDE COLLIERY CPR** Greenside Colliery Plant and Main Offices Area	Project No. 566644

Figure 12-1: Greenside Colliery Plant and Main Offices Area

srk consulting	**GREENSIDE COLLIERY CPR** Greenside Colliery Plant Workshops, Eskom Switchyard and Truck Load-Out Area	Project No. 566644

Figure 12-2: Greenside Colliery Plant Workshops, Eskom Switchyard and Truck Load-Out Area

srk consulting	**GREENSIDE COLLIERY CPR** Greenside Colliery Mining Workshops, Daylight Shaft and Change House Area	Project No. 566644

Figure 12-3: Greenside Colliery Mining Workshops, Daylight Shaft and Change House Area

12.2.3. Coal Processing Plant

The coal crushing, screening, washing, filtering stock piling and ancillary plants all appeared to be in good condition, with housekeeping lacking in some places, as is expected of a plant that is striving to achieve 150 direct operating hours (**DOH**) per week. Truck loading facilities are available on site, with rail siding facilities being off site. There is a stockpile at the plant (for underground material) and between the plant and transportation area. Stormwater and water from underground is used primarily in the washing and screening plants. The mine has 40 Ml/day allocation from the eMalahleni Water Treatment Plant. Currently all the Company mines are using about 25 Ml/day.

12.2.4. Mining Equipment

The continuous miner, shuttle cars and roof bolter were visually inspected at the Thandeka underground mining section and all appeared to be well looked after and properly maintained. The mine maintains all its machinery and equipment, except for four CMs and 12 LHDs, which are serviced by the Original Equipment Manufacturer (**OEM**). Other equipment is inspected at regular intervals by internal or external consultants as prescribed by the mine under the maintenance management policies.

12.3. Electrical Infrastructure

[12.10(h)(x)] [SR1.1(ii), SR4.3(iii), SR5.4(ii)]

12.3.1. Bulk Power Supply

Greenside receives its bulk power supply directly from Eskom via three Points of Delivery (**POD**), as indicated in the Eskom Power Usage 2019" spreadsheet (AAC, 2019a). The three PODs are:

- Greenside 1st point MD649 2.2 kV main sub, with agreed NMD of 7.5 MVA;
- Greenside 2nd point MD1656 9 Shaft, with agreed NMD of 1 MVA; and
- Greenside 2 Cairns MD4404 (Cairns Shaft + Blackhill) with initial agreed NMD of 10 MVA, increased to 12 MVA in October 2019.

The Eskom Power Usage 2019" spreadsheet (AAC, 2019a) was reviewed, and the following can be noted:

- The mine never exceeded the agreed NMD at Greenside 1st point and Greenside 2nd Point PODs for the period reviewed, namely January 2019 to July 2019;
- There is no information on the peak demand consumption and the utilized maximum demand at Greenside 2 Cairns POD for the period January to March 2019. However, the spreadsheet indicates that the agreed NMD was exceeded each month from April to July 2019. The utilized maximum demand was 11.4 MVA for the month of April, May and June and 11.9 MVA for July, versus the agreed NMD of 10 MVA at the time. The mine has noted that the agreed NMD has since been increased from 10 MVA to 12 MVA, effective October 2019; and
- The mine was penalised for exceeding the agreed NMD and for the reactive energy charge in June 2019. This is a clear indication that the agreed NMD with Eskom was not enough to supply the power requirements, hence the increase in agreed NMD to 12 MVA. There is also room for improvement on power factor correction at Greenside 2 Cairns POD.

It is recommended that the fixed and variable costs per unit as indicated in the “Eskom Power Usage 2019” spreadsheet be revised to latest Eskom costs, so true power costs are reflected. The mine has engaged with Eskom regarding application for increase in agreed NMD. An increase to 12 MVA in agreed NMD was granted by Eskom, effective October 2019.

12.3.2. Surface Electrical Reticulation

Surface infrastructure power supply is from Greenside 1st Point MD649 2.2 kV main substation. This substation has Vacuum Circuit Breakers (**VCB**s) and remote switching installed. Remote switching is via a pendant. Each bus section has an installed power factor correction capacity of 1 200 kVAR, each made of 800 kVAR and 400 kVAR capacitor banks, to reduce losses in the distribution system thus helping with energy conservation. Two 400 KVA generators have been installed to supply power to critical equipment during Eskom power failures. The switchgear is also equipped with digital relays for protection. Test blocks have been installed so that easy and simplified testing such as secondary injection testing can be achieved.

The mine was busy installing an automatic fire detection and suppression system at the time of the visit. The detection system was fully installed, while the suppression system still needed to be completed and commissioned. The mine has since reported that the fire suppression system was installed after the site visit; Sperosence, the OEM, expected to commission the system in October 2020. The 2.2 kV substation appeared to be well looked after and properly maintained. The substation logbook was also inspected and was found to be in order. The 2.2 kV main substation supplies the following main surface infrastructure with power:

- The Nooitgedacht Plant HT Substation;
- 6# conveyor Motor Control Centre (**MCC**);
- 12 Shaft Fan substation;
- Hostel substation;
- Security substation via the hostel substation;
- Sewage plant via the booster pump fed from the 12 Shaft fan substation;
- Main office substation;
- Recreation club substation via the main office substation;
- Several “housing” minisubs via the rec club substation. It must however be noted that there is no longer accommodation on site and thus some of these “houses” have been turned into offices such as the maintenance management offices, while others remain vacant;
- Lamp room substation;
- Workshop substation;
- No 5 Seam fan house via the lamp room substation; and
- Several auxiliary transformers.

The review of the 2.2 kV reticulation single line diagram indicated that there are still areas such as the main office substation, security substation and recreation club substation where obsolete oil circuit breakers are still in use. This type of circuit breaker is also known to be a fire hazard. Critical areas such as the main offices, recreation club and security substations are equipped with two incomers, to allow for redundant supply in case the other feeder fails. A 90 kW capacity photovoltaic (**PV**) power plant has been installed close to the main offices. Interviews with mine personnel during the site visit revealed that this PV power plant is not dedicated to a particular section but feeds directly into the mine’s distribution network.

12.3.3. Underground Electrical Reticulation

Main power supply to the underground infrastructure is from Greenside 2 Cairns MD4404 (Cairns Shaft + Blackhill) via the 22/6.6 kV Blackhill switchyard. This switchyard in turn supplies power to the 6.6 kV Blackhill consumer substation, the 22/6.6 kV NWS Umlalazi switchyard and the 22 kV/690 V Thandeka switchyard. A ring feed is established between the Umlalazi switchyard and the Thandeka switchyard, while the Blackhill consumer substation is fed via dual supplies from the switchyard, for redundancy.

The Blackhill consumer substation then supplies power to the 6.6 kV Blackhill underground substation, the

Blackhill shaft fan substation and the Blackhill shaft fan substation 550 V MCC. A 125 kVA 6.6 kV/550 V transformer has been installed to step the voltage down from 6.6 kV to 550 V for low voltage distribution at the MCC. Two 6.6 kV/690 V 2 MVA transformers have been installed to step the voltage down to 690 V for low voltage distribution at the shaft fan substation MCC. Supply to both the Blackhill underground substation and the Blackhill shaft fan substation is on a redundant system, for continuous supply should one of the feeders fail. Supply to the Blackhill shaft fan substation 550 V MCC is on a radial feed, as this MCC mainly supplies non-critical equipment such as welding socket outlets and substation pressurisation fans. Power factor correction is installed at the Blackhill consumer substation for energy conservation; however, the capacity of the power factor correction is not indicated on the single line diagram. It is recommended that the single line diagram be updated to the as built status, so it indicates the installed capacity of the power factor correction as well.

The underground NW5 6.6 kV substation was inspected during the site visit. The switchgear is made of VCBs and is fully equipped with digital protection relays. The substation is equipped with a fire detection system; however, there was no automatic fire suppression installed at the time of the visit. The substation fan was also not interlocked to the fire detection system. Information received from the mine in October 2020 is that the installation of the fire suppression system has since begun post the site visit, and that this work was about 70% complete. The work is expected to be completed in October 2020. The substation appeared to be well looked after and well maintained. The 1 000 V feeder breakers panel inspected at Thandeka section was found to be well looked after and well maintained, as were the trailing cables on the shuttle cars. The underground electrical reticulation is as follows:

- 6.6 kV for overall underground medium voltage reticulation;
- 1000 V for mining equipment (shuttle cars and CMs);
- 550 V for pumping; and
- 400 V for lighting and small power.

Phase 1 installation of the eastern block infrastructure was scheduled to start in January 2020 with commissioning expected to be in March 2020. Construction of the East Block infrastructure also includes re-location of the Thandeka fans to the eastern block to adequately ventilate this section. Information received from the mine was that there was a delay in completing this project as previously scheduled. The current status on the project at the time of writing this report is that the E1 belt, which will be tipping onto the 4B belt, will be ready on 13 October 2020. The new Thandeka section belt (panel NE700-02), will be tipping onto the E1 belt. First coal, by Thandeka from the East Block, is expected by 16 October 2020. The ventilation fan drives, which were on Liquid Resistance Starters, have been upgraded to VSDs and will be moved to the East Block.

12.4. Communications and Control

The engineering manager explained that the mine has an Advanced Process Control (APC) system in place, which results in 3% of energy saving. This, together with the PV plant installed close to the offices, not only contribute to some reduction in carbon footprint, but to some power cost saving as well.

The decline access control is based on a robot light system, and underground mobile equipment are also equipped with a Proximity Detection System (**PDS**). The mine also indicated during the site visit that the upgrade of the underground fibre backbone network and switches will be finished in December 2019. This is to improve underground communications such as underground to surface communications. The mine has since reported in October 2020 that this installation has been completed, however the installation was not fully commissioned at the time of writing this report. It was also indicated that the front five trunk belts are on VSDs. The belts are started from the control room and have safety features such as pull wire, belt rip detection, belt alignment switches and start up sirens. Blocked chute detection has been installed at the transfer chutes.

Each area of the mine is equipped with a dedicated server (e.g. Cairn Shaft Control Room, security; managers offices, training pit room etc.) which link to the main server via a fibre network. The main server allows for redundancy and there is also a Wi-Fi system installed, with the main infrastructure positioned at the managers' offices and at the main office block. Voice communications include telephones which are based on the PABX network, and radio communications for production purposes.

12.5. Security and Access Control

Access control is at the main entrance whereby all visitors and short-term contractors will first sign in at the security entrance and declare all belongings such as laptops and tools before gaining access to the mine. A Skycom system is used for access control and time management of permanent employees and long-term contractors. Each employee is issued with a valid and correctly activated electronic clock card, with the following as some of the rules embedded to ensure that only authorized employees are granted time-access:

- Certificate of Fitness expiry date;
- Shift control;
- Work permit expiry;
- Passport expiry;
- Training;
- Correct access area; and
- Induction expiry.

All employees are expected to clock at the beginning and at the end of each shift to control time and time related events such as standby and overtime. This Skycom access control is linked to the payroll administration system. Random personal searches and alcohol testing are conducted by security personnel. SRK is of the opinion that the security and access control around the mine is well designed and properly managed.

12.6. Maintenance Management Systems

The mine was using the computerised Ellipse Maintenance Management System at the time of the site visit. However, the mine indicated that they have since moved to a SAP system in October 2020.

An asset register of all maintenance assets is created, and the metrics of each asset entered.in the system. A critical analysis is carried out to determine the maintenance intervals for each asset. The critical analysis is mainly based on the following:

- Safety;
- Cost of a machine;
- Input from OEMs; and
- Input from foremen and artisans.

The criticality of equipment is classified based on how that particular item will affect safety and production should it break down. For example, ventilation fans and conveyors are classified as “Critical A” items while shuttle cars are classified as “Critical B” items. Some of the predictive maintenance measures adopted by the mine include but are not limited to condition monitoring, on site oil laboratory, online monitoring of ventilation fans and hourly online vibration analysis of critical conveyor belts.

The maintenance management department is further split into two departments, namely the maintenance management and scheduling department and the works management department. The maintenance management and scheduling department is responsible for maintenance scheduling and creating work orders, while the works management team is responsible for assigning relevant artisans to work orders, issuing work orders to artisans and closing off work orders once the jobs are completed.

For unscheduled maintenance, breakdowns and the time that a breakdown occurred are first captured. Then a work order is created and approved by the responsible supervisor. Work is then carried out. The work order is then signed by the responsible artisan and foreman once the work is complete and returned to the Works Management Department for closing off and filing of the work order. The mine continuously does a Pareto analysis (the 80/20 principle) to avoid regular breakdowns, and to ensure that a machine achieves maximum availability with minimum maintenance work being done on it.

The reliability engineer indicated that, depending on the type of equipment, there are weekly, three-weekly, monthly, yearly and three yearly scheduled maintenance cycles. For planned or scheduled maintenance, meetings are held on every Tuesday and Thursday whereby the schedule for the next four weeks is discussed, and the agreed schedules logged into the system respectively. Issuing of work orders follows the same procedure as unplanned maintenance. For maintenance that is carried out by third parties or OEMs, the work order is issued against the responsible foreman a month or two before the work is supposed to be carried out. It is then the responsibility of the foreman in charge to let the third party or OEM involved know of the scheduled date. Examples of maintenance contracts with third parties and OEM's on major equipment are:

- Service contract with Sandvik for the maintenance of 12 LHDs;
- Cost per tonne contract with Joy Mining Machinery for four CMs;
- Yearly transformer oil testing and analysis by Fluidex; and
- Yearly switchgear injection tests by WPI Power Solutions (**WPI**).

Oil sampling and testing facilities (excluding transformer oil sampling and analysis) are available on site.

LDVs and buses are replaced as per age and condition, however the strategy on major equipment such as CMs are group based and is as follows:

- 2.5 Mt – minor overhaul;
- 5 Mt – major overhaul;
- 7.5 Mt – minor overhaul; and
- 10 Mt – machine replacement.

The overhauls and replacements are scheduled in the system. For replacement capital, the maintenance management team will work with the project engineer to compile a cost estimate letter for all equipment that needs to be replaced. The project engineer will then forward this letter to head office for approval. Approval of replacement capital is mainly based on Key Performance Indicators (**KPI**s) of each site, and the reliability engineer indicated that historically above 80% of replacement capital applications were approved. Machine Condition Assessments are first carried out before a request can be done for capital to be swapped around on equipment replacement. In each of the years 2014, 2015, 2018 and 2019, one CM was replaced, and the Business Plan 2020 (AAC, 2020d) provides for further replacement of one machine in each of the next five years.

There were some issues identified by WPI during the injection testing carried out on the Greenside 2.2 kV main substation in July 2019. However, the mine indicated that these issues have since been addressed and closed out. The mine's maintenance and works management systems and strategies appeared to be well followed and effective.

12.7. Engineering Capital and Operating Costs

[SR4.3(vii), SR5.6(iii)]

12.7.1. Capital Costs

[SR5.6(iii)]

No expansion capital has been allocated for Greenside with all capital being classified as SIB and Stripping and Development (S&D). The Capital Dataset (Base Case) document received from the Company contains the following provisions in the Forecast and Business Plan for the next five years (2020 to 2024) (AAC, 2019*o*). The total SIB and S&D capital expenditure as detailed on the Capital Dataset (Base Case) is ZAR1 828 million which include items as indicated Table 12-1.

The amounts budgeted for in the Capital Dataset (Base Case) document were benchmarked relative to similar operations, and SRK is of the opinion that the budgeted amounts are relatively high, considering the potential mine closure in probably 2026. SRK has therefore scaled down the budget due to the reduced maintenance cycles (due to potential mine closure in 2026), as indicated in Table 12-3. This money also incorporates any expenditure necessary to adapt the existing mining fleet to mine in areas of lower mining height.

Table 12-1: Greenside Capital Cash Flow

Item	Category	LoM (ZARm)	2021 (ZARm)	2022 (ZARm)	2023 (ZARm)	2024 (ZARm)
Filter Press Plate Replacement	SIB	16.9		9.6		7.3
Roofbolters overhauls	SIB	59	21.9	11.6	12.4	13.1
O/Haul & Replacement of LSL 190 LHDs	SIB	86	16.6	17.6	18.8	33
Ancillary Equipment	SIB	85.4	30.6	13.5	22.3	19
Plant & SIMMS Phase IV-VII	SIB	47.7		10.5		37.2
CM Replacements	SIB	210.5	66	70	74.5	
East Block access Phase II (S&D)	S&D	270.6	77	133.6	60	
New Dump	SIB	108			13	95
Water Management around Dump	SIB	47.7	35.4	12.3		
Double Header Section	SIB	72.5	72.5			
Shuttle Car Overhaul & Replacement	SIB	167	27	28	29	83
Feeder Breaker Overhaul & Replacement	SIB	34.5		5.7	9.8	19
UCM Overhauls	SIB	176.4	31.6	33.5	35.7	75.6
Underground Conveyor Infrastructure Upgrade	SIB	25.7	25.7			
Fatigue Management System	SIB	7	7			
Underground Fire Suppres.	SIB	81	57	24		
Remote Isolation Systems	SIB	11.8	11.8			
LDV GTS Compliance	SIB	6.2	6.2			
Total Capital		**1514**	**486**	**370**	**276**	**382**

Table 12-2: Greenside Capital Cash Flow from Cost Model 2021 LoM

Item	Category	LoM (ZARm)	2021 (ZARm)	2022 (ZARm)	2023 (ZARm)	2024 (ZARm)
Filter Press Plate Replacement	SIB	9.6		9.6		
Roofbolters overhauls	SIB	16.8	11	5.8		
O/Haul & Replacement of LSL 190 LHDs	SIB	26.5	8.3	8.8	9.4	
Ancillary Equipment	SIB	33.2	15.3	6.7	11.2	
Plant & SIMMS Phase IV-VII	SIB	5.3		5.3		
CM Replacements	SIB	136	66	70		
East Block access Phase II (S&D)	S&D	38.5	38.5			
New Dump	SIB	-			-	-
Water Management around Dump	SIB		-	-		
Double Header Section	SIB		-			
Shuttle Car Overhaul & Replacement	SIB	42.3	13.4	14.2	14.8	-
Feeder Breaker Overhaul & Replacement	SIB	2.6		2.6	-	
UCM Overhauls	SIB	65.1	31.6	33.5		
Underground Conveyor Infrastructure Upgrade	SIB	12.8	12.8			
Fatigue Management System	SIB	3.5	3.5			
Underground Fire Suppres.	SIB	40.2	28.3	12		
Remote Isolation Systems	SIB	-	-			
LDV GTS Compliance	SIB	3.1	3.1			
Total Capital		**436**	**232**	**169**	**35**	**-**

12.7.2. Operating Costs

[SR5.6(iii)]

Table 12-3 is a summary of the historical engineering operating costs based on the historical production as indicated, while Table 12-4 is the forecast operating cost over the next six years. Table 12-3 indicates that engineering labour costs have been increasing by an average of about 10% year-on-year from 2017 to 2020.

Table 12-3: Greenside Historical Engineering Operating Costs

Item	Units	2017	2018	2019	2020
Tonnes	(Mt)	4.70	5.10	4.92	4.65
Labour	(ZARm)	158.7	156.9	189.1	205.6
Stores	(ZARm)	23.7	23.8	28.6	35.9
Sundries	(ZARm)	111.6	122.2	106.8	102.2
WCS	(ZARm)	147.0	145	157.3	175.5
Grand Total	**(ZARm)**	**441**	**448**	**481.8**	**519**
Total Eng Opex	**(ZAR/t)**	**94**	**88**	**98**	**112**

Note:

1. The figures for 2020 are based on actual data for January – August and forecast estimates for September – December.

Values in Table 12-4 are taken from the Cost Model 2020 LoM, as compiled by SRK. From Table 12-4, the following have been considered when compiling the engineering operating costs:

- Engineering labour costs have been assumed at 30% of the total labour costs;
- From the stores' items listed in the model, SRK has considered the maintenance and plant items as falling under engineering. Other items were considered to fall under other disciplines such as mining;
- From the sundries' items in the model, only power and water costs were considered as part of engineering operating costs; and
- All the WCS items were considered as part of the engineering operating costs.

Table 12-4: Greenside Forecast Engineering Operating Costs

Item	Units	2021	2022	2023	2024	2025	2026
Tonnes	(Mt)	5.2	5.2	5.2	5.3	4.8	2.1
Labour	(ZARm)	205.7	205.7	205.7	205.7	205.7	85.7
Stores (Maintenance)	(ZARm)	18.9	19.8	20.9	22.6	21.9	9.1
Stores (Plant)	(ZARm)	21.7	21.7	22.9	24.8	24.0	10.0
WCS	(ZARm)	186.9	191.6	198.3	208.7	204.2	79.2
Sundries (Power and Water)	(ZARm)	112.3	107.2	107.8	110.6	98.8	41.2
Grand Total	**(ZARm)**	**543.4**	**546.0**	**555.6**	**572.5**	**554.6**	**225.2**
Total Eng Opex	**(ZAR/t)**	**100**	**106**	**107**	**107**	**116**	**121**

The factors that have a major influence on operating costs at Greenside (and most other mines) are:

- The cost of electricity and fuel. Except for efficiency improvements, these are for the most part beyond the control of the mine;
- Salaries and wages; which should increase approximately in line with the Business Plan and inflation;
- Machinery repairs and maintenance. Major overhauls and replacements are provided for in the Stay in Business Capital. The maintenance costs for the LHDs and CMs are pegged according to the maintenance contract;
- Mining or other contractors' expenses can be controlled by firm contracts; and
- Other expenditure such as explosives and consumables are mostly sourced locally, and therefore immune to foreign currency exchange rates.

Based on the above, it can be assumed that the mine's current operating costs rates should continue for the next five years with increases approximately in line with inflation. The mine has a solar power plant with an installed capacity of 90 kW, as part of energy efficiency. This solar plant feed directly into the mine's overall reticulation. Continuous investigations into more energy efficiency programmes that can be implemented to try and reduce the power costs should be carried out by the mine.

It is noted that pending legal action by Eskom against NERSA may result in additional increases in future power costs, impacting the forecast operating costs. Eskom is known for requesting tariff increases that are significantly above inflation. It is in the public domain that Eskom has taken NERSA to court over the ZAR69 billion bailout that the government of South Africa gave to Eskom, which NERSA deducted from Eskom's approved revenue for the current tariff period, which ends in March 2022. The Johannesburg High Court has on 28 July 2020 found that NERSA acted unlawfully in doing this, and that the money must now be reinstated to Eskom's revenue in a phased manner over a period of three years. This may lead to tariff hikes of about 15%, which may take effect as early as April 2021. NERSA indicated at the time that they will appeal against a High Court ruling judgement on its Eskom tariff decisions. NERSA was granted leave to appeal the High Court ruling in October 2020, with NERSA indicating that the appeal will be heard by the Supreme Court of Appeal. The matter is important for the country as a whole, as higher tariff increases will put more financial strain on the customers, especially high consumption customers such as the mines.

12.8. Risks

[12.10(h)(x)] [SR5.7(i)]

The bulk power supply unreliability remains a concern for the entire country. Operations such as the mines are normally asked to reduce their consumption (load curtailment) during Eskom load shedding, depending on the stage of load shedding at that particular time. This can result in disruption to production for the mine operators.

Year on year Eskom tariff increases which are above inflation result in higher than anticipated operating cost increases. There may be an opportunity to implement energy efficiency programmes to try and offset the high power costs. However, in doing this, factors such as capital requirements and payback periods will need to be considered to see if implementing these projects will help.

Use of oil circuit breakers as identified in this report remains a fire hazard.

The reader is referred to the risk assessment section (Section 0) of this report for further identified risks and their mitigations.

12.9. Conclusions

The mine's infrastructure is robust and sufficient to provide for the LoM requirements. The agreed NMD is also enough to supply the power requirements of the mine. Forecast capital as revised by SRK is in the right ballpark. This is based on the conclusion drawn after benchmarking with similar operations, considering the size, capital costs and age of the machines, together with their working conditions and maintenance management, that the SIB capital is in the correct order of magnitude for the planned future production. The SIB capital is also in line with historic costs. SRK therefore does not expect the capital to be overspent by a large margin.

Operating costs can be highly influenced by year on year tariff increases that are way above inflation. The electrical infrastructure inspected during the site visit appeared to be well looked after and well maintained.

13. Logistics

[SR5.4(iii)]

Greenside supplies coal to both the domestic and international market. For the international market, coal is supplied through the RBCT, via the RLT which is shared with other mines in the area. For the domestic market, coal is transported from site via various contractors, independent from the mine.

The product from No 4 Seam Plant Module 1 and Module 2 washing plant is transported by the product conveyor to the two stockpiles, namely E1 and D1 stockpiles, by means of E1 and D1 conveyors. From these stockpiles E1 and D1 Withdrawal Conveyors transport the product directly to the J Conveyor which then delivers the product to the Conveyor K, for delivery to the RLT, or the product passes onto the product stockpiles for later reclaim to the RLT. Product from Module 3 washing plant is transported by the product conveyor to the Stockpile R, from where the R Withdrawal Conveyor is used to transport the product directly to the Conveyor K, for delivery to the RLT.

The product from No 5 Seam Plant is put on to its own stockpile where dewatered middlings from the No 4 Seam plant is also placed. The product can also be sent to silos for loading road trucks to the domestic market or it can be sent either to Conveyor K or to a stockpile next to the AFE stockpiles for later loading to the RLT.

Trucking of products to the RLT also takes place. Trucking is done by the independent contractors, Zizwe, who are also responsible for the loading and trucking on site.

13.1. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

- Conveyor K, which is a conveyor that takes the product from Greenside plant to the RLT, is seen as a potential bottleneck. Should this conveyor break down for extended period, additional trucking to the RLT will be required resulting in additional costs; and
- Trucking of product to the RLT by the independent contractor can increase the operational costs due to increase in fuel prices and maintenance costs.

14. Occupational Health and Safety

[12.10(h)(viii)] [SR5.2(viii)]

14.1. Introduction

Due to the nature of mining operations, exposure to various hazards exist that may cause harm to employees and contractors. The prime responsibility for health and safety rests with the management.

The MHSA requires that the employer must be able to prove risk reduction and risk control using various forms of risk assessments (baseline risk, issue-based risk, continuous risk assessments etc.).

The consensus in the South African mining industry is that zero harm is achievable.

While significant progress has been made in improving safety performance in the South African Coal Mine industry in recent years, additional safety improvement plans are required to achieve an environment of zero harm.

14.2. Occupational Hygiene and Health

Occupational health is aimed at the protection and promotion of the health of workers by preventing and controlling occupational diseases and accidents by eliminating conditions hazardous to health at work. The aim is to minimize all occupational hygiene exposures to below OELs as contemplated in all mandatory CoPs and Regulation 9.2 of the MHSA.

The working environment for the Company is similar to all opencast and underground Collieries and the identified occupational health risks are also similar. Identified occupational health risks include airborne pollutants (dust), noise induced hearing loss (**NIHL**) and heat/cold stress-related illnesses.

14.2.1. Occupational Risk Management and Controls

[12.10(h)(x)] [SR5.7(i)]

The Health, Safety and Environment (**HSE**) risk assessment processes are applied equally to matters of occupational hygiene and health. In addition to the risk assessment procedures, the Company has all the HSE management system documentation in place with respect to:

- Hazards to health to which employees may be exposed to be identified and recorded;
- The risks to health to be identified and assessed;
- Control measures are required to eliminate or control any recorded risks at the source;
- As far as the risk remains, the following should be in place;
  - Where possible personal protective equipment is provided; and
  - A programme to monitor the risk to which employees may be exposed has been instituted.

14.2.2. Occupational Hygiene and Health System for Mines

The Company has implemented occupational health control systems as set out in Table 14-1 and complies with the requirements in all material aspects.

Occupational health risks to which employees at the mine may be exposed are summarised in Table 14-2.

14.2.3. Occupational Hygiene Measurements

Airborne Pollutants – Dust

Coal dust is the main airborne pollutant in coal mines and the cause of Occupational Diseases such as Coal Workers Pneumoconiosis (CWP) and Chronic Obstructive Airway Disease (COAD).

The main sources of coal dust at underground and opencast operations are continues miners (CM), cable handling activities, shuttle cars, stone dust tractors, removal of overburden, drilling, blasting, crushing and transport of ore via roadways. The dust measurement results for 2017 to -2020 for Greenside are set out in Table 14-3.

Table 14-1: Summary of Occupational Hygiene and Health Legal Aspects for the Company

Aspect	Requirements	Status
Pollution sources: Drilling, blasting, cutting, loading, hauling, crushing and process plant.	MHSA Section 11 (1) requires: Hazards to health to which employees may be exposed to be identified and recorded; The risks to health to be identified and assessed; Control measures are required to eliminate or control any recorded risks at the source; and as far as the risk remains, the following is required: Where possible personal protective equipment to be provided; and A programme to monitor the risk to which employees may be exposed has to be instituted.	Employees continuously exposed to dust containing silica concentration in excess of 18% are at risk of contracting the lung disease silicosis. Coal seam silica content: 3 to 5%. The Occupational Hygiene Baseline Risk Assessment will have to be reviewed for any material changes in the underground operations and the required controls implemented.
Irrespirable atmospheres	MHSA Section 16.2 (2) If the risk assessment in terms of Section 11 shows that there is a significant risk that employees may be exposed to irrespirable atmospheres at any area of the mine, the employer must ensure that no person goes into such area without a body-worn self-contained self-rescuer which complies with the SABS 1737 specifications.	No surface operations identified with irrespirable atmospheres. All underground employees are issued with approved self-contained self-rescuers.
Occupational hygiene measurements	MHSA Section 12 (1-3) The manager must engage the part-time or full time services of a person qualified in occupational hygiene techniques to measure exposure of health hazards at the mine.	The mine has an appointed Ventilation/Occupational Hygienist.
Mandatory reports to the Regional Principal Inspector (DMRE)	MHSA Section 9.2 (7) The employer must submit to the Regional Principal Inspector of Mines the following reports on occupational measurement results: 21.9 (2) (a) – Airborne pollutants personal exposure; 21.9 (2) (b) – Heat stress exposure; 21.9 (2) (c) – Cold stress exposure; and 21.9 (2) (d) – Personal noise exposure.	These reports are compiled and submitted to the Principal Inspector on a quarterly basis.
System of medical surveillance	MHSA Section 13 (1-8) The manager must establish and maintain a system of medical surveillance of employees exposed to health hazards. A record of medical surveillance for each employee exposed to health hazards must be kept; The records are to be retained until the mine closes; The medical surveillance programme should ensure that the baseline health of every employee entering the workforce is recorded, that their state of health is monitored throughout the duration of their employment. The program should diagnose early signs of ill health, which have to be treated and investigated; All diagnosed cases are thoroughly investigated to determine if the illnesses are worked related or inherited cases before the cases are certified; and Certified cases are referred to the certification board for possible compensation.	The Mine makes use of the Witbank Mine Hospital to conduct medical surveillance of employees.
Annual Medical report	MHSA Section 16 (1) (2) Every occupational medical practitioner at a mine must compile an annual report covering employees at that mine, giving an analysis of the employees' health based on the employees' records of medical surveillance, without disclosing the names of the employees.	Annual reports are compiled by the Witbank Hospital occupational medical practitioner (OMP).

Table 14-2: Identified Occupational Health Risks

Source	Health Hazard	Occupational Exposure Limit (OEL)	Risk
Coal Dust	Inhalable ≥10 µm	10 mg/m³	Upper respiratory diseases
	Respirable ≤10 µm	2.0 mg/m³	Coal miners Pneumoconiosis, Chronic Bronchitis, Emphysema. Compensation claims
Coal Dust	Crystalline Silica	0.10 mg/m³ (New milestone 0.05 mg/m³)	Silicosis Compensation claims
Welding	Metal fumes	5.0mg/m³	Lung diseases Kidney damage
Diesel exhaust emissions (Enclosed areas, workshops etc.)	Gases		
	Carbon Monoxide	30 ppm	Poisonous
	Nitrogen Oxide	25 ppm	Poisonous
	Nitrogen Dioxide	3 ppm	Poisonous
	Particulate Matter		
	Diesel Particulate Matter (DPM)	DMR milestone: 0.16 mg/m³	Carcinogenic (Cancer) Compensation claims
Flammable Gas	Displacement of Oxygen	1.4%	Explosive and asphyxiation
Mine fires	Gases		
	Carbon Dioxide	5 000 ppm	Asphyxiation/toxic
	Carbon Monoxide	30 ppm	Poisonous
Thermal	Heat	WB> 27.5°C	Heat stress
	Cold	DB > 37.0°C	Heat stress
		ECT ≤ 5.0 > - 30	Cold stress
Noise	>85 dB for duration of 8 hours	85 dB	(NIHL Compensation claims
Radiation (weightometers)	Ionizing radiation	20 mSv per annum	Cancer
UV radiation (environment)	Sun burn	-	Skin disorders
Power tools and TMM vehicles	Vibration	-	Musculoskeletal disorders and neurological effects
TMM vehicles	Ergonomics	-	Discomfort, fatigue and musculoskeletal disorders

Note:

1. WB: wet bulb temperature.
2. DB: dry bulb temperature.
3. ECT: equivalent chill temperature.
4. TMM = Trackless Mechanised Mining

Table 14-3: Greenside Dust Measurement Results

Reporting Area	2017	2018	2019	2020
Coal Dust				
Total samples	102	139	217	229
Total samples > OEL (OEL: 2.0 mg/m³)	13 (13%)	14 (10%)	44 (20%)	75 (33%)
Silica Dust				
Total samples	102	139	217	229
Total samples > OEL (OEL:0.10 mg/m³)	0	0	3 (1%)	13 (5.7%)

Note:

1. The 2020 figures are based on actual data for January – September and forecast estimates for October – December.
2. The reason for the increase in dust samples in 2019 and 2020 was due to changes to the DMR sampling guidelines.

SRK Comments

The diagnosed Noise Induced Hearing Loss cases (**NIHL**) cases increased from two cases in 2017 to six cases in 2018 and decreased from six in 2018 to one 2020. With NIHL having long lagging periods before there any symptoms, the diagnosed NIHL cases can fluctuate from year to year. However, in the quest towards zero harm, there is a downward trend in diagnosed cases. Most of samples exceeding the OELs were measured at the CM areas. An increase in employees exposed to coal dust can have a resultant increase in CWP cases.

Employees exposed to dust with a silica content in excess of 18% (gold mines) are at risk of contracting the lung disease silicosis. Coal seam dust with a silica content of 3 to 5% is regarded as a low health hazard (no diagnosed silicosis cases).

Dust Management Plan

The proposed dust prevention programmes include the following:

- Ventilation (dilution);
- Continues miners fitted with water sprays;
- Dust suppression in haul roads (Dust-A-Side);
- PPE. Dust masks. Face masks for the COVID-19 virus also prevent dust inhalation;
- Entry examinations are followed by watering down of all access roads;
- Tipping points equipped with water sprays; and
- Extraction fans in specific areas.

Airborne Pollutants - Diesel Particulate Matter

On 12 June 2012, the World Health Organization (**WHO**) classified diesel exhaust emissions as a Class 1 carcinogen (WHO IARC, 2012). Employees exposed to airborne Diesel Particulate Matter **(DPM)** in excess of the OEL are at susceptible to contracting DPM-related cancers. Underground trackless mining areas are considered a prevalent source of the emission of DPM.

Exposure above the defined OEL can result in employees contracting certain types of cancer.

The DPM measurement results for 2017 to 2019 for Greenside are set out in Table 14-4.

Table 14-4: Diesel Particulate Measurement Results

Reporting Area	2017	2018	2019	2020
Total samples	7	5	5	5
Number of samples exceeding OEL (OEL: Target 0.16 mg/m³) Total Carbon	0	0	0	0

Note:

1. No samples were taken between January – September 2020; all sampling is planned for September – December 2020; thus all 2020 figures are estimates.

SRK Comments

In terms of the annual results for 2017 to 2020, no measurement results exceeded the OEL. During this period, the diesel emissions were well managed. The measurements for 2020 have been planned for the last quarter of 2020; the figures for 2020 are a forecasted estimate.

Airborne Pollutants – Welding Fumes

Although welding fumes have been identified as a health hazard, measurement results are below OEL of 5.0 mg/m³.

Noise Exposure

The Company routinely monitors noise exposure at the Greenside operations. Most underground employees are exposed to noise levels between 85 and 105 dB(A) over an 8-hour time weighted average (**TWA**). In terms of the 2019 quarterly reports, the highest recorded instantaneous noise level did not exceed 103 dB(A). This is the protection level [103 dB(A)] of the current hearing protection devices (HPDs).

The following controls are in place to prevent employees from contracting Noise Induced Hearing Loss (NIHL):

- All areas with noise levels in excess of 85 dB(A), have been demarcated as noise zones;
- Employees must wear hearing protection devices (HPD) in noise zones. The HPDs can reduce noise levels from a maximum of 103 dB(A) to below 85 dB(A); and
- All mining equipment noise levels will not exceed the DMRE milestone limit of 107 dB(A).

Radiation

The weightometers (scale, Troxler gauge etc.) in the process operations are nuclear sourced. In terms of the Occupational Hygiene reports, radiation is not included in the measurement results nor is it recorded in the annual medical reports. Although weightometer Radiation does not pose a significant hazard, radiation measurement results should be included in the annual airborne pollutant reports. Radiation levels should not exceed the maximum permissible level of 20 mSv per annum.

Heat and Cold Stress

In terms of the average surface mid-summer temperatures in the eMalahleni area which average between 25.0˚C and 30.0˚C dry bulb and the shallow mining depths (±100 m) in the underground collieries (average rock temperatures: 22.0˚C), there is no risk of heat disorders for the surface and underground operations.

The mid-winter surface temperatures of 1.0˚C can cause cold stress. Thermal clothing is provided to employees when the temperature approaches the action level of 6.0˚C.

14.2.4. Occupational Health Surveillance

The Company compiles annual health surveillance statistics as shown in Table 14-5.

Table 14-5: Occupational Health Surveillance Statistics

Item	2017	2018	2019	2020
NIHL - Diagnosed cases	2	5	3	1
Silicosis - Diagnosed cases	0	0	0	0
Chronic Obstructive Airway Disease (COAD)	1	0	1	0
Coal Workers Pneumoconiosis – Diagnosed cases	5	5	1	1
Occupational Cardio-respiratory Tuberculosis (TB)	1	0	1	0
Asbestosis -Diagnosed cases	00	6	1	1

Note:
1. The health surveillance results are compiled once per annum in January of each year.
2. The 2020 figures are based on actual data for January – September and forecast estimates for October – December.

The number of diagnosed dust-related occupational health cases fluctuate from year to year. This can be ascribed to occupational diseases having long lagging periods before there are any symptoms of a disease. However, there is a downward trend in the number of diagnosed cases.

It is possible to record occupational tuberculosis cases in the health surveillance statistics. However, from an occupational health point of view, tuberculosis should not be classified as an occupational health illness. Pulmonary tuberculosis is caused by bacteria and therefore, coal dust or any dust for that matter, cannot cause tuberculosis. Many employees contract tuberculosis when they have low immune systems, due to underlying illnesses such as HIV/AIDS and/or Silicosis. Due to the low silica content in coal seams (3 to 5%), there should be no risk of any silicosis-related tuberculosis cases.

One asbestosis case was diagnosed in 2019 and one in 2020. In terms of the baseline risk assessments, asbestos is not associated with coal seams in South African coal mines and therefore cannot be classified as an occupational health hazard at the Company. Asbestosis has a long lag period (up to 50 years) before there are symptoms of the disease. The employees may be inherited cases, who worked in asbestos environments before coming to the Company.

The Company has a good Noise Induced Hearing Loss Management Programme in place. The diagnosed NIHL cases decreased from six in 2018 to one 2020. However, NIHL has a long lagging period before there any symptoms. The diagnosed NIHL cases can fluctuate from year to year.

All diagnosed occupational health disease cases are thoroughly investigated to determine if the illnesses are work related, inherited or non-occupational illnesses before the cases are submitted for certification and compensation.

14.3. Safety

14.3.1. Health and Safety Policy

The Company has a Safety, Health, Environment and Quality (SHEQ) policy in place (updated January 2020) and gained OSHAS 18001 and ISO 14001 certification. SRK understands that the Company has embraced all the key aspects that would be needed to ensure that the operations are operated and managed effectively in these areas.

14.3.2. Safety and Health Legal Compliance

A comprehensive external MHS Act legal compliance audit was undertaken by Advocate N Botha in June 2019. Out of 79 aspects, two minor non-compliances were identified. These have since been rectified.

The safety aspects and requirements for the Company are summarised in Table 14-6, which shows that the Company complies with all the safety requirements.

14.3.3. Safety Performance Monitoring

This section also sets out the current and planned safety targets as well as control/mitigation measures.

Safety Statistics

In terms of the available statistics, since 2013, there have been no fatalities to date, a commendable achievement for an underground Colliery.

The number of lost time injuries and Lost-Time Injury Frequency (**LTIFR**) per million man-hours (2017 to 2019) is set out in Table 14-7. The LTIFR decreased from 1.40 in 2017 to 0.41 in 2020 (only one lost time injury for the year) which is a commendable achievement for an underground operation.

The principle causes of the LTIs reported from 2017 to 2020 were as follows:

- Body parts struck or caught between equipment (mostly hand/arm and finger injuries); and
- Slip and fall.

Table 14-6: Summary of the Main Safety Aspects for the Company

Aspect	Requirements	Status
Regulatory requirements	Legal compliance necessary for managing risk, developing trust with government and other stakeholders Mine Manager is responsible for observance and enforcement of all safety and health regulations. Non-compliance can result in Section 54 temporary closure, penalties or loss of licence.	The Company complies with the minimum legal requirements.
Legal appointments	In terms of the MHSA, the following main legal appointments should be in place: Sect. 2A(1) - CEO;	The required legal appointments for the Company are in place.

Aspect	Requirements	Status
	Sect. 4(1) and 2A(2) - General Manager; Sect. 3(1) - Mine/Operational Manager; Sect 2.17.4 - Chief Safety Officer; Sect. 2.13.1- Engineer; Sect. 2.6.1- Site Manager; Sect. 2.6.1- Plant Manager; Sect. 17.2 - Chief Surveyor; Sect. 2.9.2 - Chief Geologist; Sect. 14.1(8) - Rock Engineer; Sect. 12(1) - Occupational Hygienist; Sect. 5.1(a) & (b) - Occ. Hygienist; Sect. 16.1(1) - Occ. Hygienist; and Sect. 13 (3) - Occ. Medical Practitioner	
Health and Safety Policy	MHSA Section 8(1)(a-d) Every manager must prepare a document that describes the organization of work, establishes a policy concerning the protection of employees' health and safety at work, establishes a policy concerning the protection of persons who are not employees but who are directly affected by mining activities and outline the arrangements for carrying out and reviewing policies. Management's commitment towards zero harm.	A Health and Safety policy is in place.
Health and Safety Committee	MHSA Section 8(2) and 8(3)(b) The manager must consult with the health and safety committee on the preparation or revision of the document and policies referred to in Section 8(1), prominently and conspicuously display a copy of the document referred to in Section 8(1) for employees to read. Each health and safety representative must be supplied with a copy of the document	The Company has the required health and safety committee in place.
Risk management, risk identification and controls	MHSA Section 11(1-4) The employer must be able to prove risk reduction and risk control. The risk management standard should determine how risks are identified and managed	Baseline, issue based and continues risk assessments have been compiled; From the baseline risk assessments, risk registers are created whereby risks are listed in order of severity; Additional Controls: Workshop risk assessment and control; A stop, look, assess and manage (SLAM) document has to be completed before a task commences; Examination and making safe of working places; Occupational Hygiene risk assessment; Fire and Explosion risk assessment; Irrespirable Atmospheres risk assessment. Self - Contained Self Rescuers are issued to all underground employees; Incident reporting and investigations; Risk and change management procedures; Job safety analysis (JSA); Safety improvement plans; Internal audits; Fire audits (external) Hawcroft fire audits (external); OSHAS 18001 audits (external); ISO 14001 and 18001 audits (external); Monitoring audits and review; An excellent system of group and individual mine procedures are in place at all operations; and All documents controlled by document controllers.
Mandatory Codes of Practice	MHSA Section 9(1-6)(7a and b) A manager must prepare and implement a code of practice on any matter affecting the health and safety of employees and other persons who may be directly affected by activities at the mine if the Chief Inspector requires it. Required CoPs: The prevention of mine fires; Emergency preparedness and response; Prevention of Flammable Gas and Coal Dust Explosions; Occupational health programme on personal exposure to airborne pollutants; Thermal stress; Fatigue Management; Noise exposure;	The required mandatory CoPs are in place. The Company has included the following non-mandatory CoPs: Management of Lamp Rooms; and Vehicle Management Plan.

Aspect	Requirements	Status
	Medical incapacitation to work; Combat rock falls in underground mines; Right to refuse unsafe work; Minimum standard for fitness to perform work at a mine; Women in mining PPE; Trackless mobile machinery; Safe use of conveyor belt installations; Safe operation of draw and tipping points; Isolation, lockout and clearance to work; and Mine residue deposits	
Safety training	MHSA Section 10(1-3) An employer must provide employees with any information, instruction, training or supervision that is necessary to enable them to perform their work safely and without risk to health.	A comprehensive training procedure is provided for all new appointments. Refresher training is provided annually.

Table 14-7: Greenside Safety Statistics

Category	2017	2018	2019	2020
Lost Time Injuries (LTI)	3	2	1	1
LTIFR per million man-hours	1.40	0.85	0.41	0.40
Fatalities	0	0	0	0

Note:
1. The 2020 figures are based on actual data for January – September and forecast estimates for October – December.

DMRE Safety Stoppages

Table 14-8 sets out the number of stoppages imposed by the DMRE on the Company from 2017 to 2020. These MHSA Section 54 stoppages are generally implemented for fatalities and where in the opinion of the DMR there is non-compliance with the MHSA and mine procedures.

Table 14-8: Greenside DMR Stoppages

Category	2017	2018	2019	2020
Number	0	0	0	1
Total production days lost	0	0	0	0

Note:
1. The 2020 figures are based on actual data for January – September and forecast estimates for October – December.

There were no production days lost as a result of the one DMR Section 54 notice issued in 2020.

Safety Improvement Plan

In the quest towards zero harm, the Company identified focal areas to reduce the LTIFR and work-related incidents and accidents.

14.4. Safety and Health Risks

14.4.1. Falls of Ground

The potential for falls of ground through rockfalls is seen to have a medium inherent risk status for the underground operations. The reader is referred to the discussion in Section 7 for rock engineering aspects related to the probability and extent of potential falls of ground.

If not managed adequately, the consequences of this risk could be:

- Section 54 work stoppage orders from DMRE;

- Production delays;
- Injuries and/or fatalities; and
- Damage to surface structures depending on the severity and extensiveness of the collapses.

Adherence to legislation, approved Codes of Practice and standard procedures, validation of the designs by industry experts and active training and development of staff is required to mitigate this risk.

14.4.2. Lost Time Injuries

Although the number of lost time injuries have decreased, continued harm to employees can have the following implications:

- Impact on production and profits;
- Increased involvement of DMR with the possibility of additional Section 54 stoppages; and
- Revenue losses.

14.4.3. Flammable Gas

Flammable gas (methane) and coal dust explosions are one of the principle hazards in underground coal mines. Most flammable gas intersections are associated with dykes in the area.

14.4.4. Mine Fires

Major mine fires with multiple fatalities occur in the order of one major incident every ten years at South African mines (the most recent, the underground conveyor belt fire at Impala Platinum with four fatalities in 2016). Underground fires and specifically vehicle, conveyor belt and spontaneous combustion fires, can lead to a rapid increase in toxic gases, which has the potential to result in multiple fatalities.

14.4.5. Airborne Pollutants

Employees continuously exposed to respirable dust levels exceeding the occupational exposure limits in the mining operations can contract compensable occupational diseases such as CWP.

14.5. Risk Management

[SR5.7(i)] [ESG4.1]

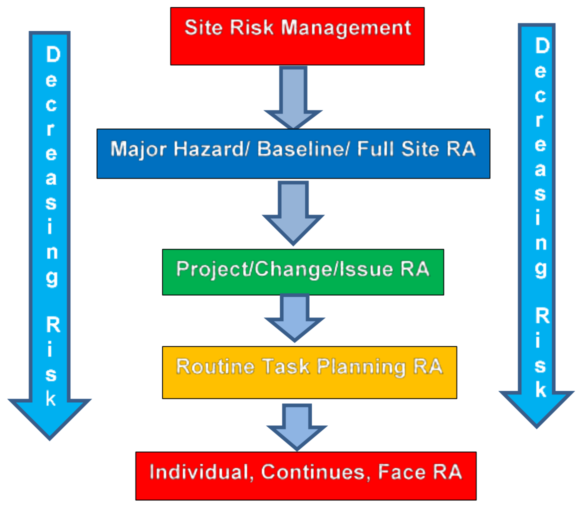
The purpose of applying a risk management process is to proactively and systematically reduce losses. The basic rationale for safety risk management continues to be the need to improve safety performance through improved decision making.

14.5.1. Overall Function, Site Major Hazard, Baseline or Full Site Risk Assessment

The objective is to look across an entire site, find potential major incidents and analyse, establish controls, document and apply approaches so that related risks are as low as reasonably practicable.

All the Company mines make use of the comprehensive “Safety Risk Management Process”.

An example of a flow chart for the systematic approach to risk management is shown in Figure 14-1:



srk consulting	**GREENSIDE CPR** Systematic Approach to Risk Management	Project No. 566644

Figure 14-1: Systemic Approach to Risk Management

15. Environmental and Social Compliance

[12.10(h)(viii)] [SR5.5(i)(ii)(iii)] [SV1.2] [ESG4.3, ESG4.4]

15.1. Environmental Authorisations and Licenses

[SR1.5(ii)(v), SR5.5(ii)(iii)] [ESG4.3]

15.1.1. Mining and Prospecting Rights

The reader is referred to the discussion in Section 3.3.1.

15.1.2. Environmental Management Programme

The reader is referred to the discussion in Section 3.4.2.

15.1.3. Water Use Licence

The reader is referred to the discussion in Section 3.4.1.

Table 15-1: Summary of Water Use Licences

Licence Number	Description	Approval Date	Comments
16/2/7/B100/C80	GNR704 Exemption (4b) - undermining Clydesdale Pan	19/02/2012	
04/B11G/CGI/3730	Amended Retreatment Plant WUL	04/07/2018	Originally approved 25/08/2015
04/B11G/G/2219	Amended PCD WUL	04/07/2018	Originally approved 07/02/2014
06/B11G/CGI/8851	3A North Dump WUL	22/02/2019	
04/B11G/AEGJ/1197	Amended IWUL	28/03/2019	Originally approved 19/07/2011

15.1.4. Mine Waste Disposal

The reader is referred to the discussion in Section 3.4.1.

15.1.5. Social and Labour Plan

The reader is referred to the discussion in Section 3.4.2.

15.1.6. Mining Charter

Greenside submitted its Mining Charter scorecard report in March 2020 (AAC, 2020a) for the 2019 reporting year against the MCIII requirements. Based on the reviewed information, Greenside met its Community Development targets in terms of its SLP. However, the SLP was not published in two languages as per the requirement of the MCIII. Greenside is 100% compliant with MCIII housing and living conditions requirements. According to the MCIII scorecard report in March 2020 (AAC, 2020a) Greenside currently accommodates 65 employees in family units and provides 699 employees with a living out allowance. However, information in the updated Greenside SLP for 2019 to 2023 (AAC, 2020e), indicates the number of staff using company accommodation as 71, with 648 receiving a housing allowance.

Greenside is currently on track to meet its procurement, supplier and enterprise development targets of 70% locally manufactured goods and 80% local services. Performance on employment equity, procurement, supplier and enterprise development is below the required level. Greenside's performance on Human Resource Development (**HRD**) is currently below 50% compliance. This means that Greenside has been spending less than 5% of HRD expenditure as percentage of total annual leviable amount. Greenside currently meets all the ring-fenced elements and is overall compliant with MCIII.

15.2. Environmental Aspects

15.2.1. Environmental Profile

The reader is referred to the discussion in Section 2.6.1.

15.2.2. Environmental Management at Greenside Colliery

[SR5.5(i), SR7.1] [ESG4.1] [ESG4.7]

Environmental management at Greenside is undertaken by the Environmental Department, which includes Mrs Erika Prinsloo (Environmental Coordinator) who is assisted by Ms Liezel Louw (Environmental Officer) and other environmental staff. The Environmental Department falls under the Technical Services Department on the mine. There are also external resources who are involved in the environmental management of the colliery, namely Anglo Coal Environmental Services (**ACES**) and Head Office Management (EMS Procedure, 2018).

Greenside has an Environmental Management System (**EMS**) where environmental information and data is collected, validated and managed. The EMS is saved on the Company's SHE (Safety, Health and Environment) Management System (Enablon). As part of the EMS, environmental staff at Greenside capture all environmental-related issues, risks and opportunities on an EMS register. Risks are rated, assigned management options and then tracked to ensure that the effectiveness of the risk mitigation is achieving the objective.

Greenside is ISO 14001:EMS:2015 accredited and as such is committed to continual improvement of environmental management at the colliery. The mine undertakes annual internal and external ISO 14001 audits usually in June/July each year.

The Environmental Coordinator confirmed that the no environmental directives have been issued for the colliery within the past two years.

Greenside has an approved SHE Policy that is posted at various locations within the mine. The SHE Policy is also communicated through the mine's induction training programme (Environmental Communication Procedure, 2018). As part of the EMS, Greenside has several internal environmental procedures as listed in Table 15-2. This list may not be exhaustive, but the procedures included in Table 15-2 were the only documents provided to SRK as part of the review.

The procedures have been prepared by the Environmental Coordinator and reviewed by designated members of the colliery technical staff and approved by the General Manager.

15.2.3. Environmental Monitoring

[ESG4.1, ESG4.7]

Greenside environmental staff undertake surface, groundwater, air quality and bio-monitoring and report on meteorological conditions; Figure 15-1 indicates the various monitoring sites at Greenside based on the most current monitoring reports reviewed). Monitoring is carried out by several external sub-consultants. Table 15-3 indicates the type and frequency of monitoring at the colliery as well as the name of sub-consultants presently commissioned to conduct monitoring.

Table 15-2: Internal Environmental Procedures

Description	Summary of Purpose	Implementation Date	Document Number	Revision Number
Context of the Organisation Procedure	To outline the process followed in determining the scope of the organisation with specific reference to external and internal issues relevant to Greenside's purpose and that affect its ability to achieve the intended outcomes of the EMS	2018/05/04	AATC025418	00
Environmental Management System Manual Procedure	To define the scope of the EMS, to provide direction to related procedures and other documentation and to illustrate how the mine's EMS complies with the requirements of ISO 14001: 2015	2018/05/21	AATC025391	13
Environmental Aspects Procedure	The Environmental Aspects Procedure forms part of the process of ensuring that management actions arise from new or altered developments (extensions, changes or new projects) and are incorporated into the EMS.	2018/05/21	AATC025390	13
Environmental Audits Procedure	To check if operations and activities specified in the EMS comply with management, operational and monitoring procedures; ensure that the mine complies with legal requirements and corporate guidelines; ensure that objectives and targets are implemented correctly and establish the efficiency of these actions; and to ensure that audit results are communicated to management and used to identify non-conformances for which corrective and preventative action must be generated	2018/05/21	AATC024891	13
Environmental Communication Procedure	The Environmental Communication Procedure describes the means whereby Greenside communicates with its employees and interested and affected parties on environmental issues. It also describes the key meetings used for the dissemination and accumulation of environmental management information	2018/05/21	AATC025406	14
Environmental Competence, Training and Awareness Procedure	This procedure describes actions required for accessing the legal register, monitoring mining related environmental legislation, and updating the legal database	2018/05/21	AATC025433	12
Environmental Documentation Control Procedure	The Environmental Documentation and Control Procedure outlines the actions required during the production, control, amendment, storage and issuing of EMS documentation, as well as the identification, storage, protection, retrieval, retention and disposal of environmental records	2018/05/21	AATC025409	14
Environmental Incident and Complaints Procedure	The Environmental Incidents, Non-conformances and Complaints Procedure describe the procedural requirements for the reporting of an environmental incident, non-conformance or complaint at Greenside	2018/05/21	AATC024890	17
Environmental Legal and Other Requirements Procedure	The purpose of the ISO14001:2015 Objectives & Targets Procedure is to give guidance into the setting and measurement of objectives and targets	2018/05/21	AATC025418	16
Environmental Management Review Procedure	The Management Review Procedure describes the process followed in the Annual Management Review Meeting of Greenside's EMS. This procedure applies to all employees and areas in Greenside	2018/05/21	AATC025426	13
Environmental Objectives and Programmes Procedure	Forms part of the process of ensuring that management actions arise (where applicable) from new or altered developments (extensions, changes or new products) and are incorporated into the EMS	2018/05/21	AATC025421	11
Environmental Waste Management Procedure	The purpose of the ISO14001:2015 Risk and Change Management is to provide a framework for the identification of risks as per the scope that has been defined in the Environmental Management Systems Manual	2019/11/18	AATC025436	17
Leadership, Commitment and Environmental Performance Procedure	Describes and outlines the duties of top management, followed by a description of the environmental performance evaluation process implemented by Greenside, as required under the ISO 14001:2015 standard	2018/05/21	AATC025417	00

Table 15-3: Environmental Monitoring at Greenside

Monitoring	Sub-consultant	Frequency
Air quality: $PM_{2.5}$ and PM_{10}	WSP Global Inc.	Continuous monitoring with monthly reporting
Air quality: Dust	WSP Global Inc.	Monthly reporting
Meteorological conditions	WSP Global Inc.	Monthly reporting
Surface water	Aquatico Scientific (Pty) Ltd	Monthly monitoring and quarterly reporting
Groundwater	Aquatico Scientific (Pty) Ltd	Monthly monitoring and quarterly reporting
Biomonitoring	Digby Wells and Associates (South Africa) (Pty) Ltd	Quarterly monitoring and reporting

Based on a review of the recent monitoring reports (2018 and 2019), the following applies for each monitoring parameter:

- **Air quality: $PM_{2.5}$ and PM_{10}:** PM_{10} concentrations are currently non-compliant, as four exceedances of the 24-hour average standard are permitted per calendar year and nine exceedances have been recorded up to and including the July 2020 monitoring report. To date the PM_{10} running average is 31.70 $\mu g/m^3$) and is compliant with the annual average PM_{10} standard (40 $\mu g/m^3$). $PM_{2.5}$ concentrations are compliant, with no exceedances recorded for the calendar year to date (up until and including the end of July 2020); ;
- **Air quality: Dust**: Dust fallout monitoring at Greenside is conducted at nine monitoring sites, consisting of nine single buckets. Particulate matter monitoring is undertaken at one location using a Topas monitor. According to the July 2020 Air Quality Monitoring Report (WSP, 2020) there have been three exceedances of residential standards over the past twelve months resulting in non-compliance with National Dust Control Regulations. One exceedance of the non-residential standard has been recorded in the past 12 months;
- **Surface water:** Greenside currently monitors surface water quality (physical and chemical) at six surface water points within and around the Mining Rights area (Figure 15-1). These points have been located in various infrastructure areas, golf course dam, Clydesdale Pan, the two crossing points within the Naauwpoortspruit and at two points where water leaves the colliery. In general, according to the latest quarterly water monitoring report prepared by Aquatico Scientific (Pty) Ltd ("**Aquatico Scientific**") (dated 1st Quarter 2020), none of the sampled surface water localities complied with the limits set in the Greenside Integrated Water Use Licence (**IWUL**) where exceedances in terms of sulphates, Total Dissolved Solids (**TDS**), calcium, magnesium, sodium and chloride concentrations were observed which is an indication that the colliery has an impact on the instream water qualities of the Naauwpoortspruit (confirmed in the GNR704 audit conducted by Shangoni Management Services (Pty) Ltd ("**Shangoni**") in 2019). However, the majority of the exceeding concentrations where below the DWA Good Water Quality Guidelines. In terms of chemical water quality, exceedances of resource water limits for sulphate was observed at one surface water point (WP012A);
- **Groundwater:** Greenside currently monitors groundwater quality (physical and chemical) at 14 boreholes within and around the Mining Rights area (Figure 15-1). In general, according to the latest quarterly water monitoring report prepared by Aquatico Scientific (dated 1st Quarter 2020), most sampled groundwater qualities are within the DWA Domestic Use, Class 01 Guideline with exceedances noted in terms of nitrate and manganese at some localities. One borehole (BH03 – located northwest of the PCDs, opencast pit and dumps) recorded high Electrical Conductivity (**EC**), TDS, hardness, calcium, magnesium, sulphate and manganese concentrations. The report also highlights that BH03 shows possible signs of acid mine drainage due to the elevated TDS, sulphate and some metal concentrations;
- **Biomonitoring:** Biomonitoring for Greenside is currently conducted at four locations throughout the colliery (Figure 15-1). The aquatic biomonitoring programme has been developed to classify the potential risks associated with sites of concern (various impoundments related to the GSC mining operations such as PCDs). Two monitoring sites for the EWRP and monitoring pits have also been included in the latest report (Digby Wells and Associates (South Africa) (Pty) Ltd, (**Digby Wells**); 2019 monitoring period) as

well as the second quarterly survey (dated 27 July 2020) for point of reference. The results of the current study indicate that the two out of the four Greenside monitoring sites showed exceedances in guideline values for conductivity levels in the autumn survey (April 2019) and one out of the four sites showed exceedances in guideline values for conductivity levels in the winter survey (July 2019). Three out of the four sites showed exceedances in both pH and conductivity levels in the spring survey (October 2019) and exceedances conductivity levels in the summer survey (December 2019). The general water quality within the monitoring impoundments was regarded as poor in comparison to the upstream reference site. The toxicity tended to vary within the impoundments throughout the 2019 monitoring period. Based on the most recent survey (dated 27 July 2020) it was found that the end-point impoundment (Y2K) greatly exceeded the recommended guidelines values for pH and conductivity and therefore the water emanating from this impoundment could pose a risk to the receiving Noupoort reach and associated biota. The auditor did note that while these results did pose cause for concern, the monitoring point within the Noupoort itself expressed no signs of toxic concern indicating that the Y2K impoundment (and other Greenside impoundments) was not at that point directly impacting on the Noupoort. Ongoing monitoring of these has been recommended by Digby Wells to ensure that the two most downstream impoundments (Y2K and D3) are not impacting on the Noupoort. The GNR704 audit conducted by Shangoni in 2019 has recommended that the colliery determine if remediation for the Naauwpoortspruit is required.

The Environmental Audit Report (Shangoni, 2019) indicated that Greenside manages weeds, alien plants and invasive vegetation according to the Biodiversity Action Plan 2017 - 2019 (**BAP**) (AAC, 2017e). During the site visit it was observed that weeds and alien invasive plants were being managed.

srk consulting	**GREENSIDE COLLIERY CPR** Monitoring Locations	Project No. 566644

Figure 15-1: Monitoring Locations

15.2.4. Environmental Performance

[SR7.1] [ESG4.1, ESG4.7]

In order to comply with South African legislation and good international industry practice, it is necessary to regularly assess environmental performance and progress against the EMPr commitments, environmental authorisations and the relevant corporate policies. In terms of the MPRDA and NEMA, a mine is required to regularly conduct audits to ascertain compliance with the requirements of the approved EMPr.

The Environmental Coordinator at Greenside confirmed that performance audits are undertaken. This was verified through a review of the Greenside Closure Plan (Golder Associates Africa (Pty) Ltd (**Golder Associates**), December 2019). The following environmental internal and external audits are carried out by the colliery:

- Internal audits:
  - WUL audits – annual;
  - ISO 14001 EMS audit – annual; and
- External audits:
  - WUL audits – annual;
  - Environmental performance audits/legal compliance audits (EMPr PAR and EA) – annual;
  - ISO 14001 EMS audit – annual; and
  - GNR704 water audit – every second year.

Audit Findings

The findings are based on a review of available documentation. A summary of the main findings of internal and external audits is provided below.

Internal Audits

A summary of the main findings from each type of internal audit conducted for Greenside are summarised below:

- **Internal ISO 14001:2015 audit:** According to the internal EMS Audit conducted in September 2020 (AAC, 2020e), 11 recommendations for improvement, 14 non-conformances and seven minor findings were observed with no major findings recorded. The minor findings observed were for partially not adhering to internal procedures or saving evidence (lack of record keeping) to support EMS requirements. Despite the non-conformances raised, the internal auditing team have indicated the EMS in general conforms to the requirements of ISO 14001:2015 and that these non-conformances can be improved upon or rectified. The recommendations to raise environmental performance included focusing all efforts to ensure that the EMS is effective to broaden the scope of environmental objectives and to deliver the achievement of objectives and compliance as well as improvement of the EMS and environmental performance. In addition to this the Colliery needs to align the EMS context determination and assessment process with actual strategic assessment processes at the mine; and
- **Internal Water Use Licence audit:** According to the internal WUL Audit (AAC 2020f) dated 15 May 2020 for the existing water use licences, the colliery was found to be generally compliant. There were, however, 12 non-compliances noted. These included non-compliances in stormwater management, seepage observed from the unlined pollution control dam (PCD), exceeding authorised dewatering volumes and storage of dirty water. The mine needed to compile a water management strategy as well as action plans to correct the non-conformances observed. A water management strategy and associated timeline was subsequently developed and provided to SRK for review.

External Audits

A summary of the main findings from each type of external audit conducted for Greenside are summarised below:

- **WUL audit**: The external WUL audit was conducted by Shangoni Management Services and Mervyn Taback Incorporated for the assessment period 1 March 2018 to 28 February 2019 (audit report dated 14 January 2020) (Shangoni and Taback, 2020). Based on the audit, the conclusion was that the colliery is generally compliant with the conditions of the existing WULs. The non-compliances observed in the internal WUL audit were however also observed in the external WUL audit. The colliery was advised to prepare an action plan to address the non-compliances noted during the audit. According to the audit report, the colliery submitted a WUL amendment in July 2019 to address several conditions which were not practical. SRK has not had sight of the action plan or the WUL amendment;
- **Environmental performance audits/legal compliance audits**: The latest Environmental Audit Report (dated November 2019) was conducted by Shangoni Management Services for the audit review period 1 February 2018 to 31 January 2019. The audit was conducted on all the approved EMPrs and EAs for the mine. The mine was found to demonstrate a high level of compliance against the various

management commitments. There were, however, several areas of non-compliance relating to commitments made in the various EMPr documents. Several shortcomings were identified mainly focused on not enough information being provided on how the colliery plans to quantify and manage risks associated with all potential sources of air, surface water and groundwater impacts. It was been recommended that the colliery submit an amendment to the aligned EMPr to address any shortcomings and make it more practical for the current mining operations. It is not certain if Greenside has commenced with the amendment of the EMPr;

- **External ISO 14001:2015 audit**: The external ISO audit carried out by Bureau Veritas in July 2019 indicated raised five minor non-conformances. The audit report documented that the colliery responded to all the non-conformances and the audit actions were closed out and accepted by Bureau Veritas as complete on 8 December 2019. The next audit has been completed for 2020 however the audit report was not available at the time of writing this report. SRK received the close-out presentation (dated 2 October 2020), which indicated that no non-conformances were awarded by the auditor for the 2019-2020 auditing period. One opportunity for improvement was identified whereby the auditor suggested that the colliery should consider analysis hydrocarbons in water going to the reverse Osmosis plant to monitor how effective mitigation efforts are as well as to serve as an early warning system for the plant; and
- **GNR704 water audit:** The most recent GNR704 audit was conducted by Shangoni in July 2019 for the period 1 June 2018 to 30 May 2019. The audit found that there are several activities which are currently been undertaken at Greenside without the required GNR704 exemptions. It was recommended that the colliery apply for the GNR704 exemption at the DWS or that these activities be included in the WUL amendment.

15.2.5. Environmental Risks

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

Non-conformances to the conditions contained within the various environmental licences for the colliery can result in pre-directives and directives being issued, which may result in a reputational risk or, depending on the nature of the directive, cessation of certain activities until the condition is complied with or until the relevant Environmental Department is satisfied that the risk has been mitigated. Several non-conformances have been noted in the internal and external audits, namely:

- Non-conformance to air quality standards in terms of the NEM:AQA for $PM_{2.5}$ and PM_{10} as well as the National Dust Control Regulations; According to the air quality monitoring reports reviewed, the colliery has had several exceedances PM_{10} in various months which has resulted in non-compliance. While this is a risk, if managed correctly, the significance of this risk can be reduced and is not considered material;
- Non-conformance to water quality standards and non-compliance to IWUL conditions: in terms of surface water quality, none of the sampled surface water localities complied with the limits set in the Greenside IWUL and therefore the mine is non-compliant. One borehole (BH03) recorded high EC, TDS, hardness, calcium, magnesium, sulphate and manganese concentrations and shows possible signs of acid mine drainage due to the elevated TDS and sulphate concentrations; and
- Non-compliance to the conditions contained in the approved EMPrs, EAs and WULs: several internal and external audits conducted indicate non-compliance in several areas. The colliery has, however, according to the various auditors, either partially rectified the non-conformances or have compiled action plans to address these areas of non-compliance. If the action plans are managed, these non-compliances can be addressed, and these risks will be non-material. Specifically, in terms of the water use licence conditions, the colliery has submitted an amended WUL include activities requiring GNR704 exemption. Until such time that the amended WUL is authorised, the colliery remains non-compliant. It is recommended that continuous follow up with the authority is undertaken to determine a possible date of authorisation.

15.3. Social Aspects

[SR4.3(v), SR5.5(iv)(v)] [ESG4.1, ESG4.5, ESG4.8]

Based on a review of the Greenside Social Engagement Plan (**SEP**) (AAC, 2019s), Greenside is located in close proximity to a number of receptors, including Mgwewane (3.96 km); Smith Brothers 1 (2.42 km); Smith Brothers 2 (3.98 km); Klipfontein (3.54 m); Groenfontein (2.16 km); Naas farm (3.83 km); Weltevreden (5.57 km); local businesses (3.24 km); and the Blackhill houses (2.44 km). The surface area rights belong to several private individuals (i.e. Smith brothers, J Labuschagne, B Thabethe, BJ Venter and RM Botha). Even though there are no traditionally owned land, Chief Bhorholo Mahlangu, who resides in Weltevreden is regularly engaged by Greenside.

As per information in the Greenside SLP Annual Report for 2019 (AAC, 2020r), the workforce comprised 772 permanent employees and 548 contractor employees. This shows an increase of 6.7% of the permanent workforce and 25.5% of contractors since 2018.

15.3.1. Stakeholder Relations and Supplier Management

[SR7.1]

Greenside's Social Performance team services ensures the implementation of the Anglo American's SEAT. The SEAT process has been designed to understand the positive and negative impacts of the operations on host communities and has now been incorporated as part of the third and latest Anglo American Social Way (**AASW3**). The AASW3 aims to facilitate more structured dialogue with stakeholders through the implementation of management responses. Greenside's Social Performance function implements the AASW3, with audits taking place on an annual basis to measure progress. Outputs are incorporated into Greenside's Community Engagement Plans which is updated on an annual basis. Based on the 2019 Social Performance Organogram, the Social Performance team reports to the General Manager via the Human Resource (**HR**) manager. The HR manager is supported by a Community Development Superintendent.

Greenside has developed a SEP that is aligned with the International Finance Corporation (**IFC**) Performance Standards (**PS**) 1 and 3. The SEP classifies stakeholders according to eight categories, ranging from residential communities, affected parties, pressure groups, local authorities, etc. Based on a review of the SEP (AAC, 2019b), Chief Bhorholo Mahlangu does not seem to be one of the identified stakeholders for Greenside. Although it has been indicated that Greenside engages with Chief Bhorholo Mahlangu from time to time, it is not clear why he does not form part of the SEP.

The Greenside SEP is in compliance with SEAT/AASW3, which requires Greenside to identify impacts and issues associated with stakeholder engagement. Some of the highest risks include a lack of enterprise development and local procurement opportunities at Greenside which could lead to community protests and business interruption. A lack of employment opportunities for the local community (whether direct from the mine or through contractors) is also a high-risk impact with similar consequences. Related to this, the SEP indicated that "access to skills development opportunities and training" could also add to reputational damage. The SEP further highlights environmental risk and emergency preparedness as a high-risk area. It notes the formation of sinkholes near the Mgewane community (an area previously mined by SAEC). Based on a review of the AASW3 assessment for 2019 (AAC, 2019c), it is understood that a health study will be commissioned to better manage any direct, indirect and cumulative impacts associated with IFC PS4.

The Greenside SEP notes that it has a grievance management system in line with IFC PS 1 guidelines. Based on a review of the Greenside SEP, the site makes use of the Company's ENABLON complaints management system, which enables trend analysis and central tracking of complaints and grievances. Complaints and grievances can be submitted via various methods, which includes email, post or fax, telephonic, website, in person or via a complaint register which is kept at the security gate Checkpoint 1. A commitment is made that grievances will be acknowledged within 24 hours and at the latest not more than five business days after receipt of the complaint. Based on a review of the Greenside Stakeholder Impact Analysis (AAC, 2019y), most of the engagements related to employment and procurement opportunities (e.g. Khwezela's LifeX projects). This was confirmed by reviewing the Greenside Enablon social incidents register for 2019. Two grievances were related to the Springvalley Community protest in July 2019 where a lack of direct employment opportunities was the reason given for the protest action. Based on a review of the Greenside Stakeholder Impact Analysis (AAC, 2019y), Greenside's development programmes aim to address grievances raised through these platforms.

Based on information presented in the Greenside SLP (AAC, 2019r), Greenside has quarterly engagement forums, with directly and indirectly affected parties, including mine management; labour unions; permanent- and contract employees; supplier representatives; communities; authorities and non-government organisations. The presentation notes of the September 2019 Ward Committee Forum were reviewed, which provided feedback on community projects as well as training and skills development programmes. Feedback was also provided on the progress that was made on the SLP LED projects between 2014 to 2018. The Complaints and Grievance Procedure was reiterated at the meeting. A review of the Greenside 2019 Engagement log sheet (AAC, 2019z) indicated that Greenside engages on a monthly basis with a variety of stakeholders. The latest record showed that meetings were held with the Ward Committee Members Forum, various ward councillors, local businesses, Greenside contractors and structures within the local municipality during the month of October 2019.

Greenside has an inclusive procurement and skills development programme with an implementation plan, which was initiated in January 2019. AAC aligns their procurement processes to the following focus areas:

- Mining Charter related aspects;
- Ringfencing procurement opportunities; and
- Alignment of internal departmental spend and contractor management. According to Anglo American's inclusive procurement policy, preference will be given to BEE, host community BEE and Historically Disadvantaged Persons (**HDP**) suppliers that meet the required safety, quality, cost and delivery requirements. The policy further encourages access to procurement through several programmes, including Enterprise and Supplier Development (**ESD**) which takes place in consultation with Anglo Zimele, among others. Greenside further complies with the Company's Supply Chain Policy (AAC, 2018r) which emphasises its drive towards preferential procurement and supplier development.

As part of Greenside's drive for inclusive and preferential procurement, the Company embarked on an initiative to prioritise procurement opportunities for host community suppliers through a Request for Information process. This process has yielded 27 opportunities being identified in 2018; seven contracts being awarded to Host Community suppliers to date, and 20 are in the process of being awarded, 26 additional opportunities have been identified in 2019 to be tendered in 2020.

The "AASW3" provides guidance on contractor management as part of Section 4B, encouraging sites to consider its potential social and human rights impacts and risks (and opportunities). According to Section 4B, tender documents and subsequent contracts must highlight these impacts and risks along with controls. Where significant impacts and risks are anticipated, a Contractor Social Management Plan should form part of the Contractor Management Plan. Regular monitoring and auditing must be conducted to ensure adequate management measures are in place (Anglo American Group, 2020).

15.3.2. Social Transition Towards Mine Closure

ESG4.6

Social Obligations

Based on the AASW3 audit findings (Anglo American Group, 2020) a commitments register is in place indicating both legal and constructive obligations. Legal obligations are tracked separately through the environmental department. The commitments register is distributed to management on a quarterly basis and includes time-based indicators. AASW3 audit findings (Anglo American Group, 2020) however found that the commitments are not being properly tracked in terms of closeout.

Greenside did not provide a social obligation list and indicated that the LED section of the SLP should instead be referenced. According to the updated Greenside SLP (AAC, 2020g), Greenside has seven LED projects that are in various stages of completion (Table 15-4).

Table 15-4: Current Social Obligations as Part of the SLP

Project (SLP)	Budget (ZARm)	YTD Actual (ZARm)	Due Date
Community Skills Development and Capacity Building (Operator Machine and Portable skills)	3.0	1.25	2023
Purchase of Ambulance for the Department of Health	2.0	2	2023
Purchasing and installation of Solar streetlights for communities around Witbank	1.0	.80	2023
Community Scholarship/Bursary scheme	3.0	2	2023
Purchasing of pothole patching machine for eMalahleni Local Municipality	6.0	-	2023
Purchasing of Sewer Machine for eMalahleni Local Municipality	9.0	-	2023
Township Economic Regeneration (Infrastructure – Industrial Park)	3.5	2	2023
Total	**27.5**	**8.05**	

Based on the information reviewed in the updated Greenside SLP (AAC, 2020g), an exit strategy is proposed for each of the SLP LED projects. Although an exit strategy has been developed, no clear thought has been given to proposing self-sustainable LED projects. Most of the projects are in the form of donations, which ensures little obligation beyond mine closure, but does not address the socio-economic impacts associated with closure.

Housing

[ESG4.6]

The Company has introduced housing allowances to promote home ownership and 95% of Greenside employees cater for their own accommodation in sustainable areas (AAC, 2019r). A transition away from housing provision at operations to full homeownership was initiated by the Company in 2007 (AAC, 2019r). Accordingly, housing allowances are aligned with market conditions to encourage employees to relocate to sustainable residential settlements in established areas. Greenside is aligned to the Company's Housing Policy and Procedure (AAC, 2011) which allows employees to choose company subsidised housing or a monthly allowance. A request to revert to company subsidised accommodation will not be granted unless approved by the Housing Committee or Human Resource Manager.

The Company further supports bulk infrastructure development within the host communities in order to fast-track housing delivery. As per information viewed in the Greenside SLP Annual Report (AAC, 2019r) employees prefer to rent or buy their own properties in the Duvha and Kwa Mthunzi Vilakazi suburbs of eMalahleni. The Company has investigated options for incorporating the Matimba Village property into Duvha Park. The Greenside SLP Annual Report (AAC, 2019r) indicates that capacity surveys within eMalahleni and KwaMthunzi Vilakazi have already been undertaken and various developments were identified as possible options for infrastructure funding and development.

Future Forum

[ESG4.6]

Greenside has established a Future Forum in November 2015, including both employer and employee representatives (AAC, 2019r). This forum meets as part of the monthly Management / Union meeting. The purpose of these discussions is to:

- Promote on-going discussion / consultations between workers or their representatives and employers about the future of the mine and industry / sector;
- Investigate the future to identify problems, challenges facing the mine and the industry or sector that may contribute to future job losses or decline of the mine and industry/sector, and agree and propose possible solutions;
- Develop turnaround or redeployment strategies to help reduce job losses and to improve business

sustainability; structure and implement proposals agreed on both by Greenside and worker parties; and

- Notify the Minister of Labour of its proposals and to indicate if the Future Forum requires support in the implementation of its plans / proposals.

Based on a review of minutes made available, the last future forum meeting took place on 27 August 2019. The external parties that were present at the meeting included the representative labour union (i.e. National Union of Mineworkers), the representative ward councillors, the eMalahleni Environmental Department, the municipal Integrated Development Planning (**IDP**) and LED managers, the Zimele Hub Manager as well as the Zimele Youth Development Manager. Agenda items include the LoM, environmental considerations, human resource requirements, learning and development opportunities, procurement, Anglo Zimele activities and LED.

Mechanisms to Avoid Job Losses and a Decline in Employment

[ESG4.6]

According to the updated Greenside SLP (AAC, 2020g), should prevailing economic conditions cause the profit revenue ratio of any operation to be less than an average of six percent for a continuous period of 12 months, the Company and Greenside would initiate a consultation process, including the implementation of Section 189 of the Labour Relations Act, 1995 (**LRA**). The Minerals and Mining Development Board will also be informed.

Should Greenside's operations be downscaled or cease with the possible effect of job losses, a consultation process will be implemented, including specifications of the LRA.

Where retrenchments or closure of the operation is imminent, Greenside would put in place the following process to ameliorate the social and economic impact on individuals, regions and economies (AAC, 2020g):

- Assessment and counselling services for affected employees;
- Comprehensive self-employment training programmes;
- Comprehensive training (non-mining skills) and re-employment programmes;
- Creation of jobs for local economies;
- Regeneration of local economies; and
- Accessing the Social Plan Fund.

The updated Greenside SLP (AAC, 2020g) acknowledges that downscaling operations may provide opportunities to employees who would like to start their own enterprises. In these cases, Greenside has included provisions as recommended by the Department of Labour.

The Greenside Closure Plan will furthermore make use of the LED strategy to diversify the economy around Greenside and consider the potential social benefits of utilizing the existing land and infrastructure (AAC, 2019r). This strategy may be expanded to include the establishment of various business structures where stakeholders will be trained and mentored in the appropriate business and technical skills as a part of the LED programme (AAC, 2019r).

The Greenside Closure Plan has not been reviewed as part of this section, please refer to Section 15.4 of this report.

Anglo Zimele

According to AAC (2003), Anglo Zimele was launched as a small business hub at some of its operations to stimulate the development of small enterprises in the communities that surround its operations. The initiative aims to create sustainable businesses towards sustainable social transition after mine closure. The Zimele hubs facilitate loans through the Anglo Zimele Small Business Start-up Fund and provide entrepreneurs with free hands-on advice on the day-to-day running of their businesses.

Contractor Management

Section 4B of the AASW3 makes provision for contractor management as part of the closure process, stating that contractors will report to Business Unit level. A limited view of social transition is taken, only considering the actual closure activities (e.g. rehabilitation) and not the post-closure impact on the loss of business. Provision is included for reviewing contract terms to align with social transition requirements; however, no further mitigation is suggested.

15.3.3. Social Risks

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

- Several Greenside lease agreements have expired. The tendency to allow lease agreements to expire could pose a risk to the operations if procedures are not in place to actively track and renew these agreements;
- There are high expectations from local communities to benefit from LED and enterprise development projects. Due to unrealistic expectations from the community, this aspect may become contentious and a challenge for Greenside to manage; and
- Other than the LED projects included in the SLP, it is not evident whether Greenside effectively tracks their social obligations. This may result in delays in social transition towards mine closure.

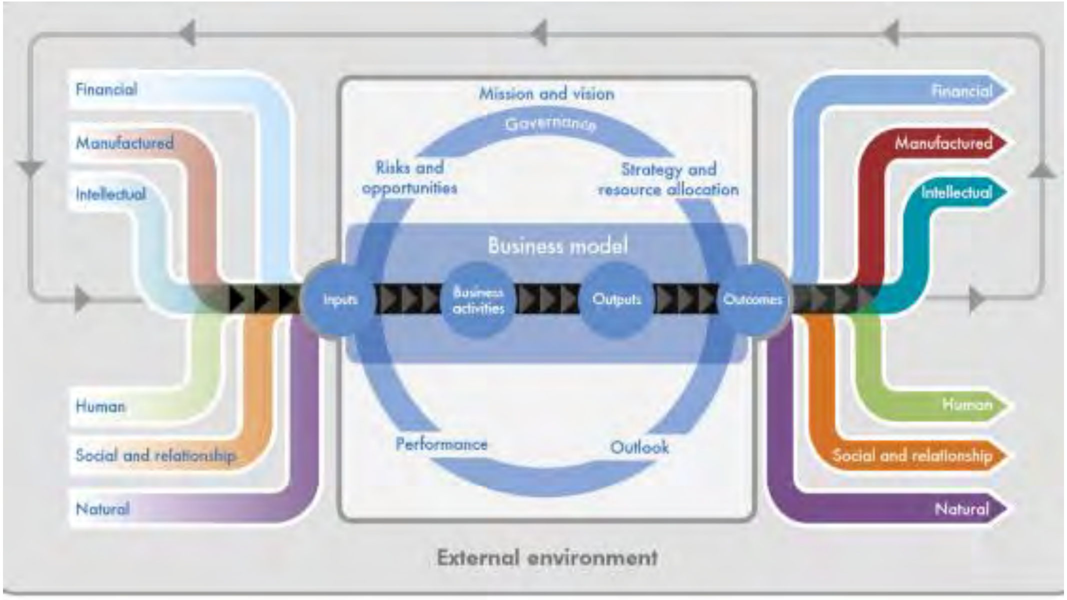
15.4. Sustainability

15.4.1. Introduction

This section reviews the sustainability of the Company according to the six-capital model of sustainable development and correlates it to the SAMESG Guideline (2017) and other reporting tools recommended by the SAMESG Guideline. The six-capital model is used by the International Integrated Reporting Framework (**IIRF**) (2013) to view the value created by business activities based on all aspects that contributes to a sustainable business, not only on financial value. The model recognises that in order to be sustainable and create present and future value, each of the foundational capitals must be considered and be in balance throughout the life of the operation. Figure 15-2 provides an overview of the IIRF sustainability reporting framework.

As evident in Figure 15-2, using the IIRF value creation framework, careful consideration is given to how business activities strengthen (creates value) in each capital area. This framework provides a standardized and internationally recognized manner in which to view the sustainability of operations. The six capitals and a short definition of each are provided below:

- **Financial capital** – refers to the pool of funds available to an organization either through making profits or through debt financing, equity, grants or investments;
- **Manufactured capital** – refers to the physical assets that are available to an organisation for conducting business. These include both physical objects like buildings and equipment and infrastructure such as roads, ports, bridges, water services and electricity;
- **Intellectual capital** – refers to knowledge-based intangibles such as intellectual property and organizational capital imbedded in systems, procedures and protocols;
- **Human capital** – refers to people's competencies, capabilities and experience and the organisation's ability to create a healthy, safe and growth-oriented work environment;
- **Social and relational capital** – refers to organizations' focus on building strong relationships with various stakeholder groups to obtain and maintain social licence to operate as well as to create shared value with host communities; and
- **Natural capital** refers to all renewable and non-renewable environmental resources that supports the current and future viability of operations. These include air, water, land, minerals, biodiversity.



srk consulting	**GREENSIDE COLLIERY CPR** Value Creation through the Six-Capital Model of Sustainable Development (*IIRF, 2013*)	Project No. 566644

Figure 15-2: Value Creation through the Six-Capital Model of Sustainable Development

- the current and future viability of operations. These include air, water, land, minerals, biodiversity.

Within this broad framework of sustainable development and based on the SAMESG Guidelines (2017), an assessment of the sustainability of the Company is done within three areas:

- External factors impacting sustainability (socio-political);
- Sustainability reporting practices; and
- Internal factors impacting sustainability (according to the six-capital model).

The sources of information used to compile this section includes:

- Information provided by AAC corporate regarding overarching sustainability matters (referenced);
- Information gathered from social media (regarding stakeholder sentiment), reputable news agencies and analyst reviews; and
- The results reported in each of the competent persons' sections completed by other specialists (referenced).

In addition to the documentation review, the following interviews also informed the results presented in this section:

- Interview with Stephen Ross, Business Improvement Manager, Greenside, AAC; and
- Interview with Nikki Fisher, Coal Stewardship and Carbon Footprint Manager, AAC.

15.4.2. External Factors Potentially Impacting Thermal Coal Mining Sustainability

[ESG3.5, ESG3.7]

Several external factors could potentially impact the sustainability of thermal coal mining in South Africa. These range from macro-economic, global factors to pressure from coal mining labour unions to keep unskilled workers employed in the sector. A short description of some of these factors are provided below:

COVID-19 and Global Macro-Economic Environment

The global COVID-19 pandemic and the resulting macro- and micro economic volatility across markets influence the both the current demand for thermal coal and the market price for coal due to Rand/Dollar value fluctuations. This volatility creates general uncertainty in world markets and have temporarily delayed calls to transition from coal to more environmentally friendly energy production methods. Most recently, a movement towards building back economies with renewable energy sources and more sustainable ways of doing business have emerged. In the short term, the thermal coal industry in South Africa was able to continue production during the COVID-19 lockdown period which helped absorb the economic impact of the pandemic. The long-term implications of these macro-economic factors for collieries in South Africa are still uncertain but could contribute to higher expectations and pressure from local mining stakeholder groups as local economies struggle as well as a larger thrust to discontinue the use of coal as countries globally rebuild themselves post-COVID-19.

Impact of Climate Change on Coal Production

Both the extraction of coal and the downstream uses of coal contribute to greenhouse gas emissions in South Africa. In turn, increased greenhouse gas emissions are a causative factor for climate change and the resulting extreme weather events. Eskom (South Africa’s state-owned electricity utility) and Sasol (South Africa’s largest coal to-to-chemical producer) together account for more than 50% of South Africa’s greenhouse gas emissions and 85% of the coal used in the local market by volume. Over the last decade, increased understanding of the impact of fossil fuels on the global environment, and more specifically air quality, climate change and extreme weather events led to more pressure for countries to transition to renewable energy sources. South Africa has an ageing fleet of thermal coal power stations that must be decommissioned over the next 20 years. If these power stations are replaced with renewable energy power sources, the demand for coal in the domestic market will be lowered. South Africa’s electricity roadmap to 2030 was recently ratified (The Integrated Resource Plan (**IRP**, 2019)). This plan commits the country to a decarbonation pathway depending strongly on the decommissioning of coal-fired power stations and accompanying deployment of renewable energy infrastructure. The implementation of this plan is wrought with challenges such as how to replace the livelihoods of approximately 82 000 coal miners in the Mpumalanga province.

A ‘Just Transition’ for Coal Mining

The conundrum of a ‘just transition’ for vulnerable workers and communities from coal-fired energy to renewable energy is compounded by pre-existing socio-economic factors such as low skills levels in mining areas, unemployment, inequality and poverty. Coal mining employment numbers in South Africa peaked in 1981 and has been in decline ever since. In addition, the skill levels of coal miners have been on the rise as more mechanised mining methods are increasingly used. Currently, approximately half of coal workers are unskilled. Within the larger South African mining context, there is already an employment crisis that requires intervention from various parties to resolve. Against this backdrop, implementing a ‘just transition’ in coal mining in South Africa might prove to be very challenging. Several scenarios for the transition from coal-fired power to renewable energy have been proposed (Burton, Caetano, McCall, 2018). The conclusion of these studies, evidence from coal transitioning in other countries and recent coal mining trends in South Africa show that South Africa is already facing a coal transition, and that specific coal regions will need support with provincial economic diversification to help lessen the impact of transitioning to a low carbon economy. Currently, instead of focus on wider spread economic diversification, the coal workers trade unions are placing increased pressure on the regulators to delay the eventual demise of the coal industry in South Africa through regulatory measures.

Social Transitioning During Closure and/or Care and Maintenance

In recent years industry bodies such as the International Council of Minerals and Metals (ICMM) have been issuing integrated mine closure good practice guidelines with sections on the importance of assisting employees and host communities of mines to transition during mine closure to other types of livelihoods (ICMM, 2019). Communities in mining footprints, like in Mpumalanga province, are often overly reliant on direct and indirect income from the mines. This leads to overdependence and a devastated local economy when the mine closes or goes onto care and maintenance. The recent restriction on mining during the COVID-19 lockdown is a good example of how deep socio-economic turmoil is felt in mining communities during care and maintenance. Within the South African mining closure regulatory framework, some mines prolong a care and maintenance status quo in order to avoid immediate decision making regarding permanent closure. Care and maintenance and the resulting job losses and decrease in secondary spend in mining communities can have the same devastating effect as closure, without the legal provisioning associated with closure.

Social and Labor Legacy Issues during Mergers and Acquisitions

In recent years, the coal industry in South Africa has been characterized by increased mergers, acquisitions and restructuring activities. The corporate turmoil and uncertainty often accompanying mergers, acquisitions and restructuring can contribute to labour and community unrest (Botchway, 2010). This destabilizing factor is compounded in the current South African context with pre-existing legacy challenges in the coal industry and the economic consequences of the global COVID-19 pandemic. Ernst & Young's (2020) top two risks for the mining industry in 2020 is social license to operate and the future of the workforce whereas reducing carbon footprint is new to the top ten risks at number four. This analysis indicates that mines whose social license to operate and workforce is threatened and who are unable to reduce their carbon footprint is at increased risk and management plans should be formulated to address these risks in a systematic manner.

This list of external factors that could influence the sustainability of a colliery in South Africa is not exhaustive, but rather indicative of the current context in which coal mining in South Africa is conducted.

15.4.3. Sustainability Reporting Practices

A high-level review of the Company's sustainability reporting practices was undertaken. Corporate sustainability reporting practices give stakeholders the assurance that the reporting entity reports its ESG practices against international good practice standards. This review is significant in the current report as it indicates what level of corporate support Greenside receives from the Company. The data underlying these corporate sustainability reporting practices are collected on site level through environmental, social, human resources, health and safety management systems and the compilation and interpretation of the data is managed at corporate level. A summary of the review is presented in and Table 15-5 indicates which sustainability reporting initiatives the Company partakes in and if the information disclosed is aggregated for the Company's operations or if standalone information for Greenside is available.

As evident from Table 15-5, the Company aggregates its sustainability reporting practices into the reports of the larger group. This practice has two implications for Greenside as a standalone entity – the onsite staff does not have the skills and capacity to perform the tasks associated with public sustainability reporting and there might be a disconnect between public reporting and governance standards and practices at individual operations.

15.4.4. Internal Factors Impacting Sustainability at Greenside Colliery

The results of the sustainability review indicate that the following indicative sustainability risks are present. For a full review of LoM risks and the keys to risk classification used in this report, see Section 20:

- High risks are present in manufactured and social and relational capitals;
- Moderate risks are present in human capital, external sustainability risks and sustainability reporting practices;
- Minor risks are present in natural capital; and
- Insignificant risks are present in intellectual capital.

The issues identified that could potentially affect the sustainability of Greenside are presented in Table 15-6.

Table 15-5: The Company's Corporate Sustainability Reporting Practices

Reporting Standard	Does the Company participate?	Aggregated/ Standalone	Reference
Carbon Disclosure Project (CDP) – Climate Change	No	Not applicable	www.cdp.com
CDP – Water Stewardship	No	Not applicable	www.cdp.com
Sustainability reporting in line with Global Reporting Initiative Requirements	Yes	Aggregated	https://www.angloamerican.com/~/media/Files/A/Anglo-American-Group/PLC/investors/annual-reporting/2020/aa-sustainability-report-2019-v1.pdf
Extractive Industries Transparency Initiative (EITI)	Yes	Aggregated	https://eiti.org/supporter/anglo-american
Public policies and governance	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
Alignment with the Sustainable Development Goals	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
United Nations Global Compact	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
Voluntary Principles on Security and Human Rights	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
UN Guiding Principles on Business and Human Rights	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
UK Modern Slavery Act Statement	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies

Table 15-6: Identified Sustainability Risks

	Sustainability Area	Identified Sustainability Risks
Internal Factors	Financial Capital	See Section 19 for economic valuation and risks.
	Manufactured Capital	Well established access and water for operations and routes for marketing; Infrastructure provisioning for closure may not sufficient; and Unreliable bulk power supply due to load shedding.
	Intellectual Capital	Efficient environmental and social onsite management systems, policies, procedures and protocols in place; Sufficient corporate human rights, climate change, sustainability, water stewardship and employment equity policies in place as guidance for sites; and Lack of on-site knowledge of sustainability reporting and strategy; should Greenside become a standalone entity, senior staff with additional skills will have to be recruited.
	Human Capital	Local employment targets and employment equity targets not met; Human resources development spend below 50% of target; and
	Social and Relational Capital	Local procurement targets set by Mining Charter not met; Enterprise and supplier development initiatives in SLP not fully implemented; Community skills development targets not met; Self-sustainability of LED projects not considered (important with reference to relative short LoM); and Lack of prior planning for social transitioning during mine closure (LoM 2026).
	Natural Capital	Minor non-compliances found in – air- and water quality, risk management, GNR704 water audit, but in process of being mitigated; Some surface right agreements have lapsed REF; Sinkholes forming close to Mgewane community possibly caused by prior neighbouring mines; Surface water risk – Lake Lucy maintenance not in place – risk for spillage if dam embankment fails; and Risk for contaminated groundwater post-closure.
External Factors	Other Sustainability Considerations	Reliance of host communities on income from colliery a risk considering current LoM; Governance systems well developed and in place on corporate level, but will require on-site specialist skills should Greenside be a standalone operation; and Social licence to operate and labour legacy challenges might resurface and/or intensify during mergers and acquisitions.
	Sustainability Reporting Practices	No CDP reporting found on public platform; No Water Stewardship (CDP) reporting found on public platform; No human rights due diligence information supplied by site or corporate; Public sustainability reporting aggregated into Anglo American corporate reporting; and Confirmation of materiality workshops with local stakeholders at site level not found.

15.5. Mine Closure, Planning and Financial Provision

[SR1.7, SR5.2(ii)]

15.5.1. Data Review

SRK undertook a site visit to the colliery on the 28 November 2019. The intent of the visit was to understand the layout of the colliery as well as to visit the different operational aspects to gain an understanding of the nature of the likely closure activities required to manage operational impacts and closure risks. During the visit, SRK also engaged with Ms E Prinsloo to understand the current operational activities and potential environmental impacts associated with Greenside. SRK also had engagements with Mr. J Human (AAC Land Management Superintendent) to broadly understand AAC's approach to closure planning, liability estimates and how AAC is dealing with legislative uncertainties at the operations. SRK also used this opportunity to request specific information relating to closure cost estimates.

SRK made use of the following documents below to provide the opinion:

- Closure Planning Reports for Greenside Colliery, as Aligned to the NEMA Financial Provisioning Regulations, 2019 (Golder Associates, 2019a);
- Update of Greenside Colliery Unscheduled and Scheduled Closure Costs Using Third Party Contractor

Rates, as at December 2019 (Golder Associates, 2019b - and related spreadsheet '*19121496 Greenside_NEMA_Unshed_Final_Dec2019_RevA.xlsm'*;

- Update of Greenside Colliery Unscheduled Closure Costs Using DMRE Master Rates, as at December 2019 (Golder Associates, 2019c - and related spreadsheet '*19121496Greenside_DMR_Unshed_Final_Dec2019.xlsx'*;
- SACE COMPLEX – Post-closure Groundwater and Geochemical Model (Delta H, 2016); and
- Note for the Record – Annual Financial Statement 18 February 2020 indicating financial position (AAC, 2020c).

15.5.2. Regulatory Environment

[SR1.5(v), SR1.7(i)]

Prior to November 2015, the determination of the expected closure liability and the provisioning of funds for closure was regulated by the MPRDA. On 20 November 2015, regulations under NEMA, Financial Provisioning Regulations, 2015 GNR.1147 (GN1147) were promulgated and replaced certain sections of the MPRDA. The intent of the GN1147 was to require mining operations to adopt a strategic approach to closure planning and financial provisioning. The intention is to require operations to undertake focussed closure planning and then actively implement rehabilitation measures during operations to reduce the liability at the end of the life of the mine. When GN1147 was promulgated, compliance with GN1147 was required by February 2017. However, as there are several technical issues with the regulations, various proposed amendment to the regulations have been published for comment, although no substantial amendments have yet been promulgated. Because of the technical issues related to GN1147, an extension of the Transitional Arrangements to June 2021 (as promulgated in GN24) is in effect. Although various amendments have been published for comment, there is no definition as to the final version of the regulations and how they will differ from GN1147.

Although compliance to GN1147 is not required until June 2021, mines are still required to make provision for the liability and assess the quantum of the liability under Regulations 53 and 54 of Regulation 527 under the MPRDA.

15.5.3. Closure Cost Estimates

[SR1.7(i), SR5.6(ix] [ESG4.1]

SRK understands that the liability for Greenside is assessed annually by a third party and that this assessment is used as the basis of the provision that the Company negotiates with the DMRE. The approach that is used to assess this liability is based on the 2005 Department of Minerals and Energy Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine. The 2019 assessment for Greenside indicated that the unscheduled closure liability for Greenside was ZAR554.9 million, which includes a 10% contingency, a 6% Preliminary and General and a 15% VAT provision. AAC has provisions to the value of ZAR598.3 million, as of 31 December 2019 with the DMRE as illustrated in Table 15-7. These costs are reportedly submitted to the DMRE; however, SRK was not provided with evidence the DMRE had accepted the cost estimate. As AAC has an overprovision of ZAR43.4 million, SRK is of the opinion that Greenside complies with its legal requirements to make provision to the DMRE.

Table 15-7: Greenside's Provision to the DMRE for Greenside Liability on 31 Dec 2019

Item	2019 Provision (ZARm)
Balance in Trust	362.2
Bank Guarantees	236.1
Total	**598.3**

Although Greenside has assessed the liability using the DMRE 2005 Guideline approach, there is a general recognition in the industry that the DMRE Guideline may not be an accurate reflection of the closure liability for an operation. This is because the DMRE Guideline adopts a generic approach to closure activities and the costing thereof, with this shortcoming being recognised in the Financial Provision Regulations. As there is the potential inaccuracy in the DMRE Guideline approach, Greenside has undertaken an assessment based on the Financial Provision Regulations approach where commercial rates are applied to the actual closure activities. The estimate that has been calculated using the more focussed Financial Provision Regulation approach at Greenside is ZAR440.6 million for unscheduled closure at end December 2019 (ZAR458.6 million at end December 2020) and ZAR370.3 million for scheduled closure at end December 2019 (ZAR385.9 million at end December 2020). This represents a ZAR114.3 million reduction from the DMRE approach in respect of unscheduled closure. While it is unusual for the liability assessed using the DMRE approach to be lower than that assessed using the Financial Provision Regulation, the cause of the difference at Greenside arises from the fact that a water management provision has been included in the assessment for the full extent of the underground workings. While this may be a requirement of the DMRE Guideline, this is not necessarily a true reflection of the management requirements at Greenside. The Delta H investigation (2016) concluded that no direct decant from the underground workings is predicted for Greenside. Thus, including water management requirements in the DMRE estimate may result in an overestimate of the true liability. Although the ZAR440.6 million (Financial Provision Regulations) is likely a more accurate reflection of liability than the ZAR554.9 million (DMRE Guideline), SRK is of the opinion that there may be some omissions from this number, as discussed under risks below.

SRK is of the opinion that the closure liability for Greenside is in the range of ZAR450 million to ZAR600 million (adjusting the 2019 DMRE assessment for inflation to end December 2020), with these currently appropriately reflected in the assessments Greenside has undertaken. There is a risk that the costs could be significantly higher than ZAR600 million, if complex covers are required on the discard facility as discussed below. SRK is further of the opinion that the evidence provided indicate that Greenside is compliant with statutory requirements relating to making a provision to the DMR.

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of Dec 2020.

15.5.4. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

Theft and Vandalism of Closure Structures:

SRK is of the opinion that there is a risk that potential artisanal miners may damage the closure covers placed on the discard facilities in an attempt to recover material that they may consider has economic value. There is also a risk that the various shaft plugs are damaged by miners attempting to illegally access underground working after closure. Although there is no requirement to manage underground water, there may be a requirement to install a pump and treat system to manage the groundwater impacted by the discard facilities. Should a system be installed, there is a risk that the infrastructure may be vandalised, or equipment stolen post closure, when security on the operation is reduced. Should one or more of these risks manifest, there is the potential that Greenside may not achieve their closure relinquishment criteria and that additional work may be required. This could increase the closure liability and could extend the period for which the Company is still liable for the property

Post-Closure Water Management:

As indicated, there is unlikely to be a direct requirement to manage the water made underground in the post closure environment. There may, however, be a requirement to manage the groundwater around the discard facilities as monitoring data indicate that the shallow groundwater has been impacted. As it is likely that one of the closure relinquishment criteria will be to achieve Water Use Licence requirements for groundwater, a pump and treat system may be required to mitigate the operational impacts from the discard facilities. Should a groundwater management requirement manifest, the quantum of the closure liability could increase by ZAR20 to ZAR70 million

Underestimate of Liability associated with Discard Facilities:

An estimate of the closure liability for the discard facilities is included in both the DMRE and Financial Provision Regulation estimate. The Financial Provision Regulation estimate allows for the removal of the Schoonie Dump and consolidation of the discard into the Greenside dump. The Financial Provision Regulation estimate also makes provision for the placement of a neutralising barrier, capping with 500 mm of low permeability cover and placement of a growth medium cover. While this approach has been used at other discard facilities managed by the Company, the success has been mixed and there is risk that it may not be successful at Greenside. In addition, this has not been tested with the authorities and may not meet the requirement of the National Environmental Management: Waste Act (Act No 59 of 2008). Should the regulators require a more complex closure solution including complex covers on the discard facility, there is the potential that the closure costs associated with the discard facility could increase materially (ZAR250 to ZAR350 million).

Rehabilitation of the Clydesdale Pan:

A provision is made in the Financial Provision Regulation estimate for the rehabilitation of the Clydesdale pan which has been impacted by Greenside and others mining activities. However, the actual rehabilitation requirements have not been defined, with it being SRK's opinion that the provision included is there to recognise that there may be a future liability rather than an actual quantification of the liability. SRK is of the opinion that this approach has been adopted as Greenside assumes that the Clydesdale pan will be removed by future opencast mining activities and the liability will therefore not exist. SRK considers that, while pan removal may occur, if the pan remains, the rehabilitation liability may be significantly higher (ZAR40 – 50 million) than the ZAR9 million currently included.

Integrated Closure:

As Greenside is considered by the Company to be one of the operations that is part of the SACE complex, there is an opportunity to integrate the closure requirements of all the collieries in the complex. This may result in a post closure land capability that offers more opportunities to potential post closure land users. There may also be an opportunity to integrate post closure water management and benefit from economies of scale and the requirement to have fewer management systems if integration is undertaken.

Based on SRK assessment of risks, SRK has summarised our interpretation of the closure quantum in Table 15-8. This table includes an inflationary adjustment to both the DMRE and NEMA assessment to end June 2020.

Table 15-8: SRK Summary of Greenside Liability

Item	Related Financial Closure Provision (ZARm)	
	As calculated at December 2019	Adjusted to June 2020
DMRE Assessment:		
Unscheduled	554.9	577.65
NEMA Assessment:		
Unscheduled	440.6	458.6
Scheduled	370.3	385.9
Provision to DMRE (2019 data)	598.3	Will not change until end 2020
Surplus/difference between provision and DMR assessment	*43.4*	
Additional Liability arising from Risk Items:		
Dump Covers	250 - 350	250 - 350
Water Treatment	20 - 70	20 - 70
Illegal/artisanal post closure activity	Cannot quantify	Cannot quantify
Clydesdale pan	Cannot quantify	Cannot quantify

15.5.5. Colliery Dependence on eMalahleni Water Reclamation Plant

Background

Several collieries owned by the Company generate contact water as a result of mining activities, which presents an environmental and reputational risk to the Company. In order to mitigate these risks, the Company constructed the EWRP in 2007 to treat the contaminated water. The EWRP is owned by the Company; and in addition to treating water from its own mines, the EWRP also has a contractual agreement with SAEC to treat water from the South Witbank Mine.

SRK conducted a high-level assessment of the EWRP, to establish whether it is able to meet the water treatment requirements of the mines it services. This included a review of documents provided by the Company, as well as a discussion with the plant manager of the EWRP.

Plant Feed Water Flows

The collieries that the EWRP services include: Khwezela North (Navigation and Kromdraai), Khwezela South (Bokgoni), Greenside and Zibulo, and SAEC's South Witbank Mine.

Figure 15-3 presents the plant water block flow diagram (AAC, 2020). The plant is split into two phases, with Phase 2 having been commissioned in 2018 (a ZAR835m expansion). Phase 1 and Phase 2 provide the Company with capacity to treat 44.6 Ml/day. Based on an assessment of the spreadsheet the EWRP uses to track inflows, outflows, and its costs; SRK concluded that the plant has sufficient capacity to meet the current treatment demands of the mines it services. The Company has developed a water balance with future projections of feed water flows into the plant, up until 2037. This balance indicates that the EWRP is able to accommodate these future flows. The Company intends that the plant continues to service the mines currently sending water to the EWRP and potentially other mines, during operation and post closure.

Infrastructure components are repeatedly stolen from the Kromdraai pipeline, which prevents Kromdraai water from being pumped to the EWRP. Kromdraai is a major source of contaminated water, and this presents an environmental and reputational risk for the Kromdraai operation.

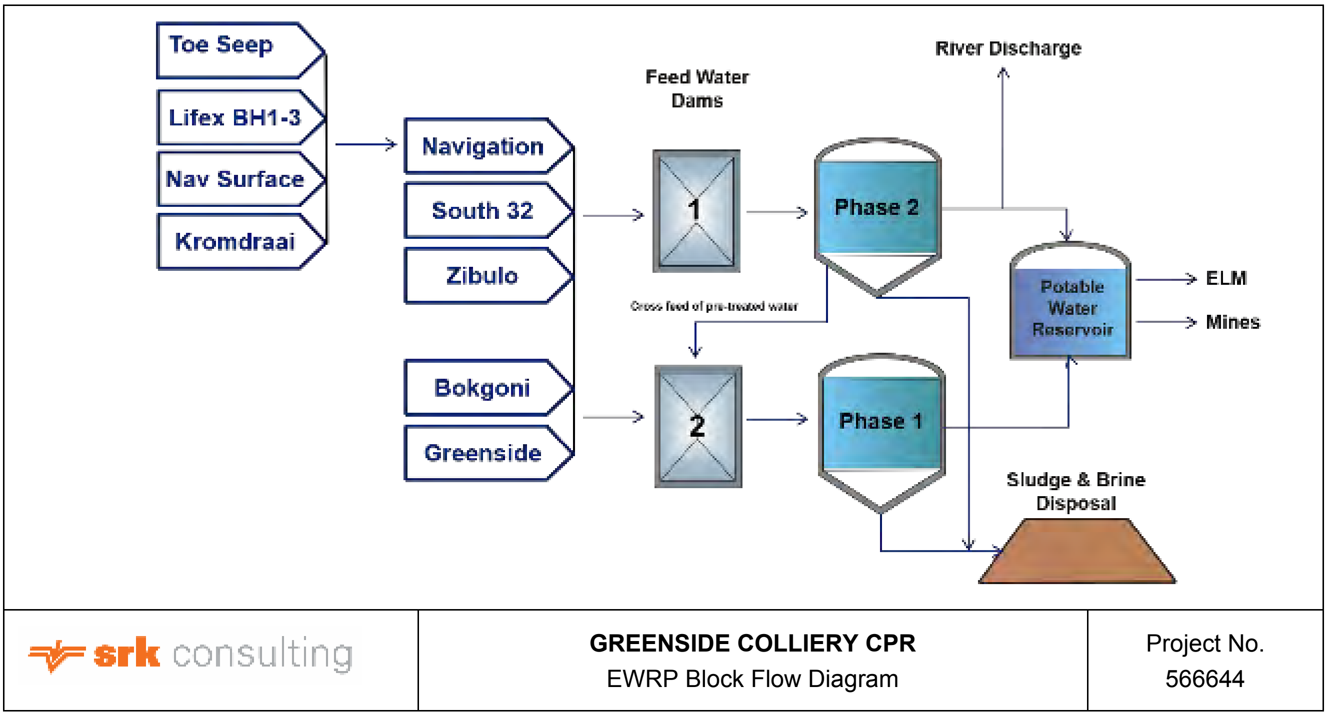


Figure 15-3: EWRP Block Flow Diagram

Plant Product Water Flows

The EWRP supplies potable water to the eMalahleni Local Municipality (**ELM**), Khwezela North, and Bokgoni (via the SACE line); and potable and process water to Greenside and the Phola Coal Processing Plant. The EWRP also releases some treated water into the surface water reserve, to assist in maintaining sufficient flow for ecological requirements.

The EWRP is a bulk water supplier, but is not a water services provider, and as such, it is not authorised to supply water to communities.

The EWRP is contractually obliged to supply water to the ELM; however, this contract is renegotiated on a three-yearly cycle; and contractually agreed volumes are expected to be aligned with future EWRP feed flows. If feed flows from the mines decrease, it is expected that the agreed supply volume to ELM will decrease proportionally.

Plant Water Quality

The Company is currently completing quality projections for the mines; however, these were not available at the time of this assessment. The EWRP Manager highlighted the following as the major quality risks for the collieries:

- Greenside: deterioration in water quality;
- Zibulo: fluctuation in sodium concentration, which has an impact on the process. Mitigated by water exchange with SAEC's Klipspruit Colliery. Other mitigation includes treating this water in the brine reduction plant;
- Kromdraai: poor quality water (low pH); and
- Navigation Lifex and Navigation Blaauwkrans MRD Toe Seep: variable quality depending on source of water at the Navigation operations. Poor quality from the Toe Seep Dam (low pH, high iron and aluminium).

Plant Waste Streams

Brine

The EWRP operates a 330 Ml multi-lined brine storage facility. Brine storage capacity is limited to the capacity of this facility, and therefore the EWRP is required to manage the stored brine volume to ensure sustained capacity.

The EWRP Team has reduced the Brine Facility level from 100% in early 2019 to 70% through the retreatment of brine in a high-pressure reverse osmosis plant (ZAR42m Capex and ZAR26m Opex). By the end of 2020 it is anticipated that the brine dam level will have been reduced to less than 45%.

In collaboration with a contractor, the EWRP Team has developed an option to extend the current Brine Recovery Plant's useful life by a minimum of four years to 2024. This will defer the capital expenditure for a secondary brine treatment process (budgeted at ZAR70m). The intent of the deferral is to further investigate options and technologies for salt removal.

However, regardless of the deferral, a final treatment process for the brine will need to be designed and procured. The final brine product or crystals will need to be disposed of, which may require encapsulation on site in purpose-engineered facilities or alternatively, disposal at a commercial waste landfill. This eventuality would present a significant operational expenditure for the EWRP.

Gypsum

The EWRP produces a gypsum waste product, from which water is removed in filter presses/vacuum filters, to form filter cake. The EWRP has an offtake agreement with Africa Lime Industries (Pty) Ltd (**Africa Lime)** to purchase the gypsum until 2022. Changing economic conditions have led to sporadic offtake, and the EWRP is currently in discussions to investigate constructing Africa Lime's storage facilities closer the EWRP. In the event of delays in offtake, the EWRP is licensed to dispose of gypsum at the Bloukrans Co-disposal Dump, in the Yellowboy compartment. The EWRP has disposed of sludge in this compartment previously, when processing issues necessitated the emptying of clarifiers in the plant, although this is not routinely undertaken. The EWRP has the capacity to stockpile two days' worth of gypsum production on site.

Life of Plant

The EWRP Phase 1 and Phase 2 were each designed with a plant life of 20 years. However, the EWRP is intended to operate indefinitely into the future. It is anticipated that the plant will need to undergo major maintenance periodically, including membrane replacement and structural component repair/replacement. A major maintenance plan was not available for review at the time of this assessment.

According to the latest structural integrity audit, the risks associated with the structures that form part of the EWRP are not critical and are manageable. The risks must be managed by way of maintenance and repair.

Risks

Approach

A high-level risk assessment was carried out to highlight the main risks to the operation of the EWRP. Aspects of the EWRP that affect the operational and closure phases of the associated collieries are addressed separately in the respective CPRs for those collieries.

The risk framework used in the Company's 2019 CPR was used in order to maintain consistency in approach, terminology and rating values[7]. The approach is summarised as follows:

- The risk, the cause of the risk and the consequence/s that are associated if the risk is realised, were described;
- The probability of occurrence and the consequence were rated, using the standard terminology; and
- Based on the likelihood of occurrence and consequence if realised, the inherent rating of each risk was determined.
- Mitigatory measures were identified for the risks and described; and
- Based on the interpretation that the actions for mitigation will be incorporated into the risk management of the project, and the perceived efficacy of the implementation, the residual risk ratings were determined.

Overview of Results

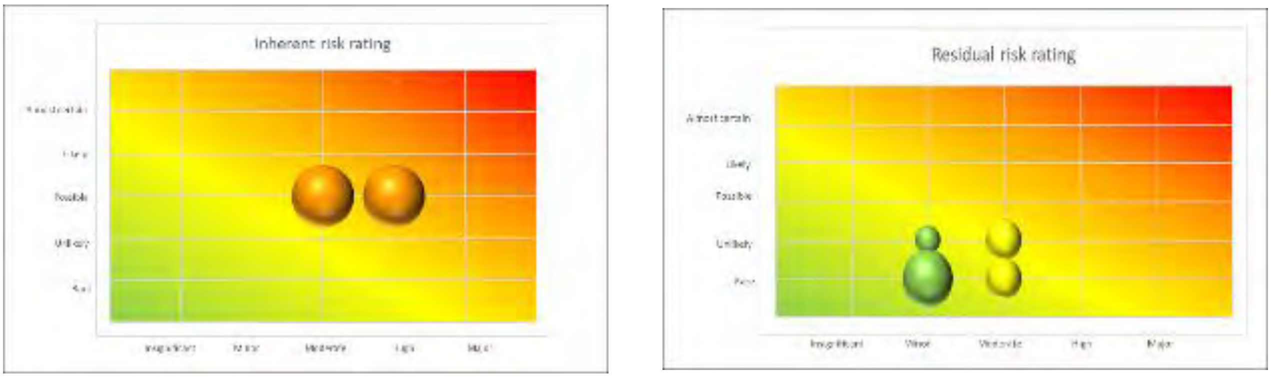
The results of the risk assessment show that a forced cessation of EWRP operation and unplanned plant stoppages (of varying duration) are the main risks.

The nuances of the risks lie in the *cause* of the forced cessation of EWRP operation and *cause* of the unplanned stoppage, particularly:

- Forced cessation of EWRP operation caused by:
  - Additional brine storage/treatment capacity not constructed in time for when the current pond capacity is reached in 2024; and/or
  - There being no gypsum storage capacity as result of no defined plan for gypsum sale post 2022.
- Unplanned plant stoppages
  - In the short-term (days), caused by poor/variable feed quality and/or no projections of feed water quality into the future; and/or
  - In the medium-term (weeks), plant stoppages caused by structural failure/critical component failure due to no or deficient major maintenance/overhaul plan for future operation.

The mitigation is therefore tailored to address the risk, while considering the specific cause. The heat maps in Figure 15-4 show risk rankings, pre-mitigation and post-mitigation.

[7] The risk framework used in the AOPL CPR was used in order to maintain consistency in approach, terminology and rating values, namely: Anglo American (2019b). Greenside Colliery Competent Person's Report (CPR) Greenside Colliery Competent Person's Report. page 145-147.



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EWRP: Distribution of Risk Rank Elements (pre- and post-mitigation)

Project No. 566644

Figure 15-4: Distribution of Risk Rank Elements (pre- and post-mitigation)

Opportunities

Opportunities exist in relation to several of the risks, namely:

- There is a potential cost saving that could be realised for brine storage/treatment. The opportunity relates to:
  - Approaching authorities proactively to establish whether they will allow for brine crystal encapsulation and disposal on site, or whether they will require trucking to a licenced commercial waste disposal facility;
  - Identifying potential offtakers for crystallised brine;
- Unplanned, short-term (days) plant stoppages caused by poor or variable feed quality and/or no projections of feed water quality into the future. The opportunity relates to:
  - Compiling response plans for each colliery for the event of feed flow stoppage at the EWRP. These could include identifying buffer storage areas/facilities at each mine, where excess water could be stored temporarily;
- Forced cessation of EWRP operation due to no gypsum storage capacity (as result of no defined plan for gypsum sale post 2022):
  - Confirming capacity of Yellowboy compartment and planning accordingly; and
  - Conducting a market study for gypsum products (in South Africa and globally).

Concluding Remarks

The technical risks to the Company associated with the EWRP are manageable, by implementing mitigation measures.

In terms of financial risks; the Company is still determining post-closure water management solutions at a number of collieries nearing End of Life; and there are currently no provisions for EWRP Opex and Stay-In-Business Capex included in the closure cost estimates for the collieries serviced by the EWRP.

16. Water Management

[12.10(h)viii] [SR3.1(i), SR4.3(ii), SR5.2(viii)]

This section deals with the technical aspects of water management at Greenside, while Section 15 deals with the legal compliance aspects. However, this section does provide context and further information about the non-compliances, specifically related to GNR704.

16.1. Surface Water Management

[12.10(h)viii] [SR3.1(i), SR5.2(ii)]

16.1.1. Site Layout

A layout of the Greenside can be seen in Figure 16-1. The colliery is located within the 1:100-year floodline of the Naauwpoortspruit. There are numerous wetlands in the immediate vicinity of the colliery.

srk consulting	GREENSIDE COLLIERY CPR Stormwater Infrastructure Layout	Project No. 566644

Figure 16-1: Stormwater Infrastructure Layout at Greenside Colliery

16.1.2. Potable Water and Make-up Water

The EWRP treats contaminated underground water that is pumped to surface from several mines in its vicinity. The EWRP is operated by the Company, and as such, potable water supply to the mine is not seen to be a risk to the operation of Greenside. Potable water is pumped into the Blue Tank at Greenside.

Make-up water to the system is primarily supplied from the No 2 Seam boreholes, with a small volume of treated water received from the EWRP.

16.1.3. Note on Water Inter-Dependencies with the eMalahleni Water Reclamation Plant

Greenside is reliant on the EWRP for the supply of potable water and some make-up water. It also relies in the EWRP to treat some of its underground water. The EWRP treats contaminated water from several mines in its vicinity, and as such, it is not a dedicated facility for Greenside. A description of the operational interactions between the EWRP, Greenside and other mines; is given in Section 15.5.5.

16.1.4. Sewage

Greenside has a sewage treatment plant (**STP**). The treated sewage effluent discharges into Green Dam.

16.1.5. Stormwater Management Systems and Controls

[ESG4.2, ESG4.4]

There are two farm dams at Greenside, both on the golf course ("Big Golf Course Dam" and "Small Golf Course Dam"). The Big Golf Course Dam is an in-stream dam in the Naauwpoortspruit.

Lake Lucy and Y2K Dam are Pollution Control Dams (**PCDs**) that are not lined. Lake Lucy receives runoff and washdown from the Plant area, which bypasses the borehole. Y2K is used only as a contingency dam in the event that Lake Lucy or Plant Erichsen Dam (**PED**) overflow. It also receives runoff from the surge pad area. The New PCD is to be used as a contingency in the future.

The PED is a process water dam that is used to balance water between the plant, Lake Lucy, and the Y2K Dam. Lake Lucy is a catchment dam for the plant and workshop. The water flows from the PED to Y2K Dam in a trench.

Dam 3 is a seepage collection dam for the discard dump. The dam collects toe seepage up to 1.3 m deep and runoff from the northern footprint of the discard dump. The discard dump will be rehabilitated. In future, the seepage will be collected in a pump and treat system and transferred to the new lined PCD. The pump and treat system will comprise a concrete-lined trench around the discard dump. Clean water will be diverted around the discard dump into the Naauwpoortspruit.

Western Trench collects run-off and toe seep from the discard dump. The trench daylights into the environment.

The shaft areas have dirty water trenches (Highveld Trench and Railway Trench) to divert dirty water to the borehole sump. The sump collects water and transfers it into the underground workings. There is also a clean water trench that conveys water past the workshops into the Naauwpoortspruit. The clean and dirty channels/trenches on site that were designed to convey dirty or clean water, have been repurposed and, where appropriate, have been split into sections. At the split, one side continues to convey dirty water, and the other side conveys clean water. The concrete trenches were constructed in 2013, when the new PCD was built.

16.1.6. Compliance with Legislation

[SR7.1]

Greenside has a GNR704 exemption to mine under a pan.

A summary of the non-compliances to GNR704 identified in the CCS stormwater management assessment (CCS, 2019), is as follows:

- Erosion from the discard dump contaminates downstream water resources;
- Several unlined channels were constructed;
- Lake Lucy, Y2K and Dam 3 are not lined;
- The stability of the existing dam embankment of Lake Lucy is of concern, due to rodent holes and severe erosion of the dam embankment;
- Calculated stormwater run-off for the 1:50 and 1:100 flood event exceeds the storage capacities of the current capacity of Lake Lucy, Y2K and Dam 3;
- Y2K, Dam 3 and current adjacent dirty water unlined channels are within 100 m of the Naauwpoortspruit (and nearby wetlands) or within its 1:100-year flood-line;

- Gravity drainage from Lake Lucy, Y2K and Dam 3 is not possible because their downstream outflow channels are lower than the current inflow level of the existing PCD;
- The current unlined dirty water channels around the discard dump (southern side) reflect severe erosion, and are not able to accommodate peak flood events;
- The storage capacity of Lake Lucy, Y2K and Dam 3 is reduced due to large volumes of silt and an abundance of vegetation. Lake Lucy's silt trap is also non-functional;
- Some of the unlined/lined channels in plant area are not large enough to accommodate the 1:50 year flood event;
- Existing coal stockpiles next to stormwater channels are not contained by means of a retaining wall, and spill into the channels, which compromises channel capacity. These stockpiles have been relocated.
- The drainage capacity of the existing boreholes inside the downstream channels are not able to accommodate the 1:50 year flood event and high volumes of process water;
- Seepage of contaminated groundwater around the northern area of the discard dump (downstream water quality has been impacted); and
- Storm water from haul roads near the pan area could contaminate the pan area during peak flood events.

Following the above assessment, a new stormwater management strategy for Greenside was compiled in early 2020. The strategy aims to rectify the findings listed above and is planned to be implemented from 2020 to 2022. It consists of an upgrade to Lake Lucy (including repair of the oil-water separator and silt trap). Lake Lucy will be lined as part of the upgrade, and a pipeline will be constructed to transfer water from Lake Lucy to the new PCD. Y2K Dam will be rehabilitated as part of the strategy. Implementation of the strategy has commenced, and the following findings have been rectified:

- Dam 3 has been de-silted; and
- Existing coal stockpiles that are located next to stormwater channels, have been relocated.

However, until the strategy is fully implemented, Greenside remains non-compliant with GNR704.

16.1.7. Water Recycling

Shaft water is recycled via the Shaft Erichsen Dam and dirty stormwater is recycled from the pollution control dams, via the Plant Erichsen Dam.

16.1.8. Water Quality Monitoring Plan

ESG4.1

Greenside has a water quality monitoring plan in place. A summarised description of surface water quality is taken from the 2019 Integrated Water and Waste Management Plan (Shangoni, 2019):

- The majority of surface water localities could be described as neutral, and very saline to extremely saline. In terms of hardness, majority of surface water localities could be described as very hard.
- Localities WP101 and WP012B were the only sampling points which could be classified as “Good” water quality while localities WP012A, WP109 and WP129 could be classified as “Unacceptable” water quality due to high sulphate and magnesium concentrations.

16.1.9. Water Balance

The water balance modelled various rainfall scenarios and calculated resultant spillage. The Golder water balance and its recommendations were used to inform the CCS Report on Visual Inspection of Existing Dirty Water Drainage and the Water Management Strategy. The water balance made recommendations to divert overflows, and/or to construct surge facilities, to prevent overflow into the environment.

16.1.10. Key Issues and Risks

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

Key Issues

The specific surface water risks are:

- If the Lake Lucy dam embankment fails, this will result in discharge of dirty water into the environment. This will in turn result in the contamination of surface and groundwater resources;
- In the event of a 1:50-year storm (or greater), dirty water from the dams and/or channels will be discharged to the environment. This will in turn result in the contamination of surface and groundwater resources; and
- There is already evidence of surface and groundwater contamination in the vicinity of the site. This poses a compliance and reputational risk.

16.2. Groundwater Management

[12.10(h)(viii)] [SR5.2(viii)]

16.2.1. Aquifer Characteristics

The area is characterised by two major water-bearing zones; a shallow perched aquifer and a deeper fractured rock aquifer within the Karoo stratigraphy. The shallow aquifer is generally low yielding and most groundwater users rely on the deeper fractured aquifer. Recharge to both aquifers is considered to be from rainfall and is estimated at between one and three percent of Mean Annual Precipitation.

Groundwater flow is controlled by geological structures such as dykes, faults and contacts. The estimated transmissivity in the fractured zone varies between 1.0 and 1.7 m^2/day, with the matrix characterised by an estimated transmissivity of between 0.15 and 0.25 m^2/day. The low transmissivity minimises the rate of groundwater flow, and migration of any contaminants away from the mine workings.

16.2.2. Baseline Hydrogeological Setting

The regional groundwater levels vary from artesian conditions (zero metres below ground level (**mbgl**) within the low-lying areas to 20 mbgl in the topographically elevated areas. Local groundwater levels within the Greenside area have been distorted by the mine dewatering. Groundwater levels in the underground mine workings clearly show a decline due to the ongoing groundwater abstraction. The identical trends in groundwater levels for the No 4 Seam and No 2 Seam indicate hydraulic interconnection between the two sets of mine workings. The surrounding communities rely on groundwater for domestic purposes, livestock watering and irrigation.

An assessment of the regional groundwater chemistry shows that the background water quality is generally of good quality and suitable for human consumption. The following facilities are potential sources of contamination into the groundwater:

- Groundwater from old mine workings mixing with natural groundwater flow;
- Seepage from coal handling areas, primarily temporary stockpiles; and
- Seepage from the unlined surface storage dams.

Groundwater and surface water monitoring shows that the water downstream of the mining area has been impacted by mining activities, with elevated concentrations of sulphate and magnesium. The low pH values measured in some of the downstream boreholes and dewatering boreholes indicates acid rock drainage reactions.

16.2.3. Mine Inflows

Parts of the old No 2 Seam and No 5 Seam workings are flooded and promote the ingress of groundwater into the current No 4 Seam workings through geological structures such as fault, joints, dykes, boreholes, unsealed shafts and sinkholes. Dewatering of the active mining areas is achieved by pumping from the flooded No 2 Seam compartments via boreholes drilled from surface. Water seepages into the No 4 Seam workings are channelled towards the lower No 2 Seam workings. The mine keeps records of water pumped from underground and utilized for various purposes, though the records are not complete. The water abstracted from the underground workings is pumped to the EWRP for treatment.

16.2.4. Hydrogeological Risk Assessment

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

Risks to the groundwater systems in the area have been identified as follows:

- A numerical model developed by Delta-H (2016) indicates no direct decant from underground workings is expected but may potentially occur via unsealed exploration boreholes, historical declines or shafts. The Waterpan North area is the lowest topographically in the area and there exists a potential for decant;
- Anticipated pollution of groundwater from underground mine workings, surface dams and coal handling areas, especially the discard dump;
- Depleted of groundwater resources by mine dewatering activities. Dewatering is carried out to maintain a specific groundwater level and the low transmissivity minimises the extent of the cone of drawdown;
- Excessive ingress of seepage from surface dams into mine workings; and
- Generation of acid rock drainage.

The above risks, their rating and mitigations are discussed in detail in Section 0 of this report.

16.2.5. SRK Comments

It is SRK's opinion that the current dewatering strategy is sufficiently effective in maintaining groundwater levels below the current active No 4 Seam mine workings, for safe mining.

Elevated concentrations of sulphate and magnesium are expected within the mining area and the important factor is to ensure that water management is such that the affected water is not released into the receiving environment through discharge, decant or even plume movement.

The main concern, therefore, relating to groundwater is the post-mining decant of contaminated water, which may need treatment and management in perpetuity. If decanting occurs, pumping of water from the workings to the treatment plant will have to continue after cessation of mining.

Given the clear interconnection between the weathered and fractured aquifers, groundwater monitoring should be strictly adhered to and detailed records kept for groundwater abstraction from boreholes that pump from both aquifers.

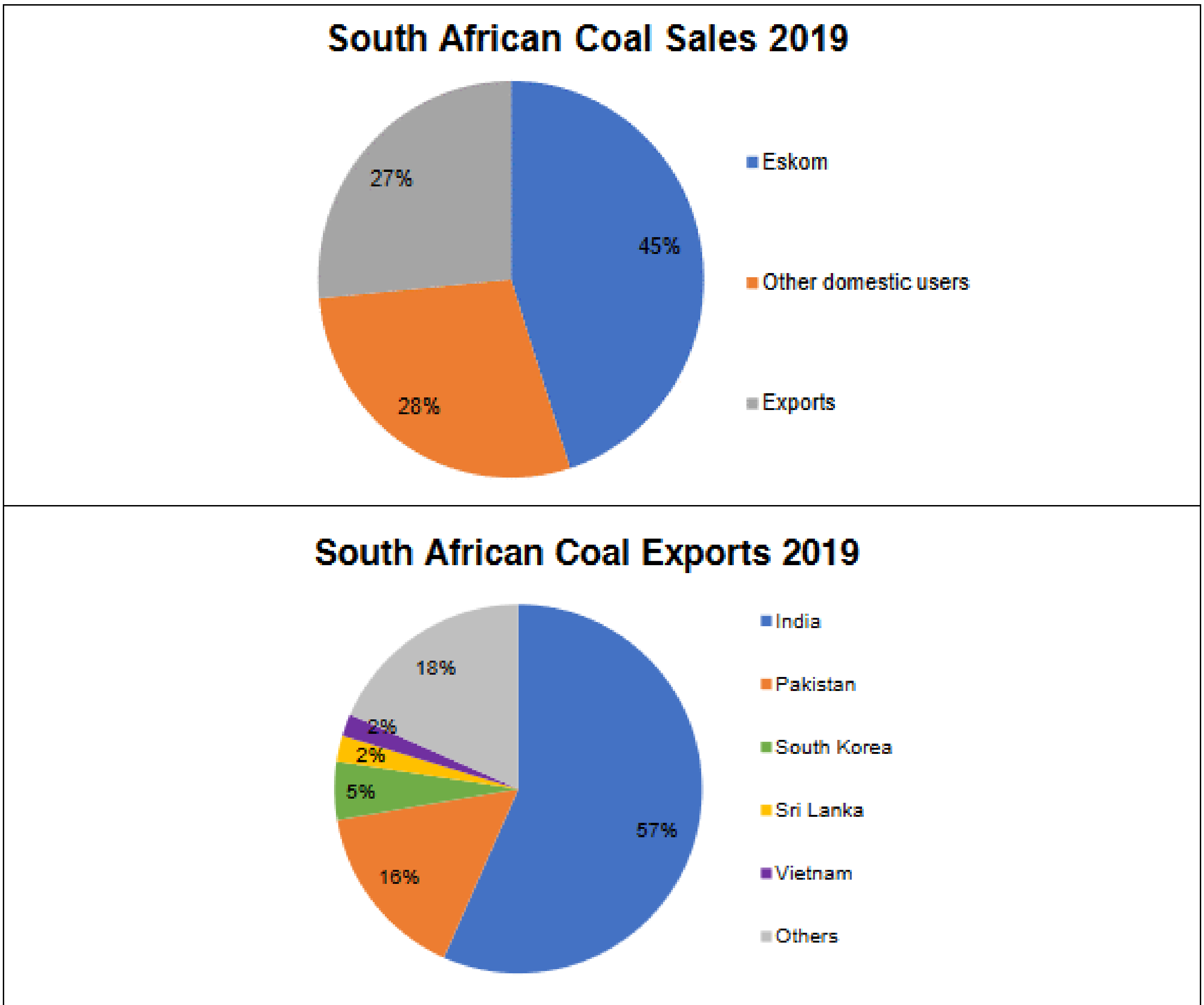
17. Utilization and Marketing Overview

[SR4.3(vi), SR5.6(i)(ii)(vi)] [SV1.14]

17.1. Introduction

The benchmark for South African export prices is the "RB1" Richards Bay free-on-board (FoB) price for a 6 000 kcal/kg premium product (minimum of 5 850 kcal/kg). This category is only a small part of South Africa's total thermal coal exports, but it is quoted the most often. Prices for lower quality coals largely follow the RB1 trend. Other coals commonly exported are the RB2 specification (minimum of 5 700 kcal/kg) and the RB3 specification (5 500 kcal/kg, minimum of 5 300 kcal/kg).

Exports made up 27% of South African coal sales in 2019, much lower than the 45% sold to Eskom (Figure 17-1, top). Coals destined for use by Eskom generally have CV[1]s around 4 800 kcal/kg of 20 MJ/kg. India is South Africa's main export market, accounting for about 57% of 2019 exports, with Pakistan a distant second (Figure 17-1, bottom).



srk consulting	GREENSIDE COLLIERY CPR South African Coal Sales and Exports 2019 *(source: Afriforesight, 2020)*	Project No. 566644

Figure 17-1: South African Coal Sales and Exports 2019

Historical coal prices for thermal coal FoB out of Richards Bay for 2013 to Quarter 2 2020 varied between USD50/t (Quarter 1 2016) and USD100/t (Quarter 3 2018) (Afriforesight, 2020). Domestic coal prices for 2014 to Quarter 2

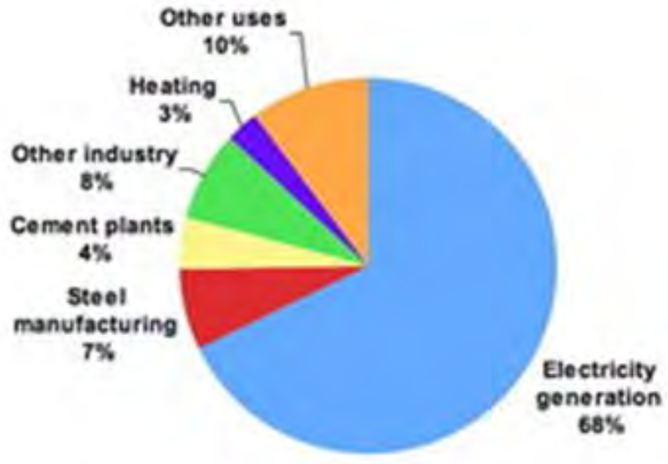
2020 have varied between ZAR440/t (Quarter 2 2015, Quarter 2 2020) and ZAR620/t (Quarter 4 2018) (Afriforesight, 2020).

17.2. Coal Uses

Different types of coal have different uses:

- Steam coal - also known as thermal coal - is mainly used in power generation;
- Coking coal - also known as metallurgical coal - is mainly used in steel production (World Coal Organisation, 2020); and
- Source of chemicals for industrial purposes.

Coal has a wide range of uses and is used in several different industries and applications (Figure 17-2.)



srk consulting	**GREENSIDE COLLIERY CPR** Uses of Coal *(Source: coalfacts.weebly.com, 2020)*	Project No. 566644

Figure 17-2: Uses of Coal

According to the Minerals Council South Africa (2020)and the World Coal Organisation (2020), the uses of coal are:

- Thermal coal is used in power stations to generate electricity;
- The steel industry is the second largest user of coal. Coking coal is used as a fuel to melt iron in furnaces to produce cast iron which in turn is further refined to produce steel;
- Energy-intensive industries such as cement, paper and aluminium use coal as the most cost-effective source of energy;
- By-products generated from burning coal, typically fly ash, are also used in production of concrete and cement bricks;
- Many chemical products are manufactured from the by-products of coal. Refined coal tar is used to make chemicals such as creosote oil, naphthalene, phenol and benzene. Soap, aspirins, solvents, dyes, plastics and fibres, such as rayon and nylon, use coal or coal by-products as components;
- Coal is converted into gas and liquid which can be used to fuel cars, motorcycles and ships;
- Coal can be turned into ammonia fertiliser. Ammonia gas recovered from coke ovens is used to

manufacture ammonia salts, nitric acid and agricultural fertilisers;

- Coal is also an essential ingredient in the production of specialist products:
  - Activated carbon - used in filters for water and air purification and in kidney dialysis machines;
  - Carbon fibre - an extremely strong but light weight reinforcement material used in construction, mountain bikes and tennis rackets;
  - Silicon metal - used to produce silicones and silanes, which are in turn used to make lubricants, water repellents, resins, cosmetics, hair shampoos and toothpastes.

17.3. Coal Market Report

The summary set out below is adapted from a report prepared for the Company by Wood Mackenzie Ltd (2021), a leading research and consultancy business for the global energy industry.

Demand for thermal coal in 2020 has been negatively impacted by the COVID-19 pandemic, declining to 6.6 Bt. It is expected that demand will rebound from 2021, growing to a peak of 7.2 Bt in 2026 and declining again by 2030 to 7.0 Bt as sources of renewable power generation increase. Demand for thermal coal will increase rapidly in the short term at 2.1% compound annual growth rate (**CAGR**), while in the long-term demand will flatten to 0.0% CAGR. In 2020, 79% of global coal-fired power generation was from Asia, up from 75% in 2019. While global coal generated power is not expected to increase significantly in the coming decade, Asia’s share of the coal power generation market is expected to grow further to 86% by 2030 when coal generation in Asia will reach around 8 910 TWh. Thermal coal is still a highly competitive source for electricity generation in sizeable markets that matter for thermal trade including China, India and the traditional markets of Japan, South Korea and Taiwan.

After sustained growth over several decades, demand for seaborne thermal coal peaked in 2019 at 1 009 Mt, before dipping to 933 Mt in 2020. This disruption is expected to be followed by recovery of demand, reaching a lower peak of 1 001 Mt in 2023 before softening to 956 Mt in 2030. South and Southeast Asia are expected to be the key growth regions through the forecast, offsetting declines in other regions including Japan, South Korea and Taiwan, Europe and China. India, the largest export market for South African thermal coal, is expected to overtake China as the largest demand centre for seaborne thermal coal in 2023.

South Africa is the world’s fourth largest export thermal coal producer. Total marketable thermal coal production was 243 Mt in 2020. South African thermal coal supply has declined over the last decade as many existing mines have reached end of life and domestic demand has declined slightly as renewable power generation capacity has been developed. Production from existing mines is expected to fall to 186 Mt by 2030 and additional projects and expansions will need to be developed to maintain supply and meet demand. South Africa produces good quality thermal coal for the export market with an average energy content of 5 594 kcal/kg NAR, which is above the global weighted average. South African coal is valued for its low levels of moisture, volatile matter and sulphur. India is the largest destination for exported South African thermal coal accounting for 50% of South Africa’s thermal coal exports in 2020 and is expected to continue at current levels through to 2030.

The South African benchmark FoB Richards Bay 6 000 kcal/kg NAR average annual price in real USD terms is expected to rebound from its 2020 low of USD66/t to USD85/t in 2021, then plateau at USD81/t by 2023 to finish the forecast period at USD82/t in 2030. Forecast ZAR:USD exchange rates and API 4 export prices as provided by Wood Mackenzie are set out in Table 17-1.

Table 17-1: Forecast Exchange Rate and API Export Price (Real Terms)

Item	Units	2021	2022	2023	2024	2025	2026	2027	2028
Exchange Rate	(ZAR/USD)	16.24	15.58	14.99	13.75	13.75	13.75	13.75	13.75
API 4 Price	(USD/t)	85.2	82.4	80.7	79	79.3	79.4	79.5	81.1

Source: Wood Mackenzie (2021)

17.4. Marketing Strategy

Greenside is operated within a portfolio of Company collieries that target an export-type product, ranging from the typical RB1 specification to an RB3 specification. The product specification for each colliery considers the capabilities of the beneficiation plant and the trade-off of the yield versus price discount for the lower grade products. The focus of the exports is due to historical investments in the rail logistics and the RBCT. In most collieries in the Witbank Coalfield, the No 2 Seam coal was ideally suited to create these export products as the ash and sulphur contents were such that the product specifications could be met at high yields. Recently, however, most of the No 2 Seam has been mined out. The export product is now mainly sourced from the No 4 Seam, which although able to meet the specifications, does so at a lower yield. In cases where both seams are exploited, they are normally mixed in the beneficiation plant and the product extracted from the combined feed. Typical export contracts limit the amount of ultrafine material added into the mix. Product sizing is normally from 1 mm upwards and so the ultrafine material is extracted by the beneficiation plants. The product ash contents are typically around 15% ash for an RB1 product, which rise as the product heat value decreases, leading to the price discounting.

In some collieries where a secondary beneficiation stage is available, a lower grade export product of 4 500 kcal/kg is produced from the second stage wash; this can be exported, albeit at a highly discounted price. This material is also a direct substitute for the better domestic-grade power station coal and, provided the logistics arrangements are suitable, can be switched between the two markets, depending upon the arbitrage between domestic and export prices. This product can also be used alongside the higher-grade products to reduce their heat value and supply a wider range of product specifications by blending with the premium product. It is not practical to produce this lower-grade product in place of the normal export product, as often the raw coal quality exceeds the lower-grade specification resulting in limited ability to control the product quality. Similarly, the wash density of the plant for these products exceeds the designed operating range of the primary stage beneficiation plants, leading to inefficient beneficiation.

Customer requirements regarding sulphur and volatile matter content is also important, as many of these products are mixed with other lower-priced, poorer quality coal; this blending is done to minimise pollution costs and heat value costs. The combustion of these mixed coals is aided by having good enough quality parameters in the better grade coal.

The other factor affecting the marketing strategy is the under-utilisation of the infrastructure for exporting coal. In recent years, all the larger shareholders in RBCT have not fully utilised their RBCT entitlement. Two marketing strategies have been developed to address this:

- Buy in coal from smaller producers who do not have entitlement and beneficiate this as necessary; and
- Sub-lease entitlement to the smaller producers to gain revenue from the spare capacity.

Both strategies are applied, but not to the extent that more than 10% of the Company's RBCT entitlement is used.

17.5. Customers

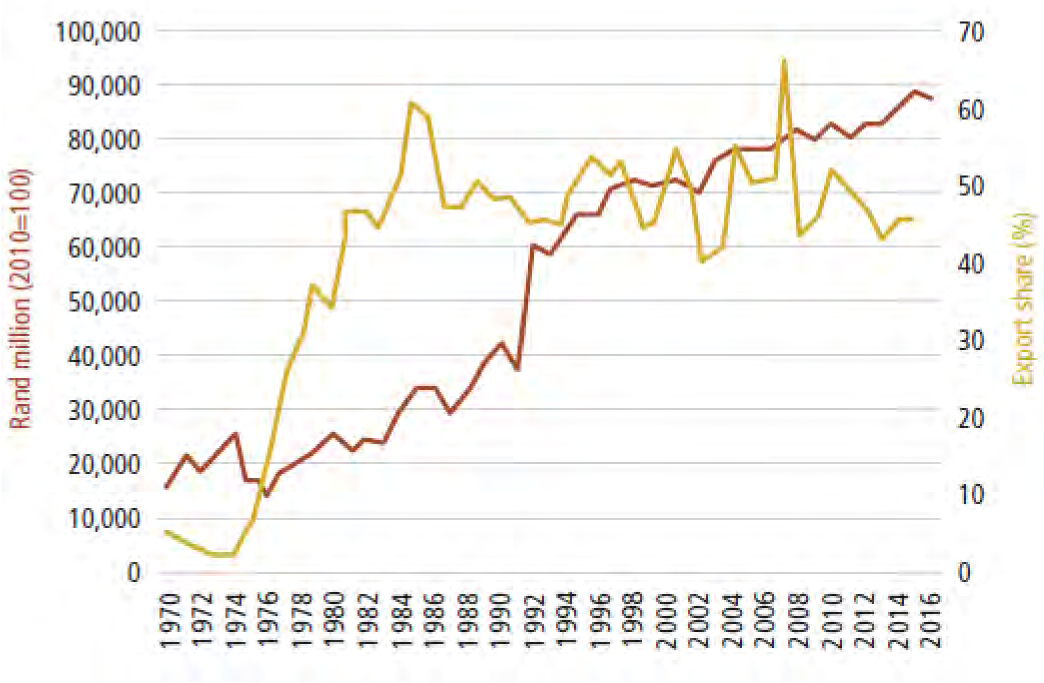
17.5.1. Export Market

The main customers today are in the Middle East, India, Pakistan, and the Far East (Japan, the Philippines and Vietnam). The former customers in Europe, who were the mainstay of the South African export market when it was developed, are no longer significant customers as they have moved to alternative fuel sources for their power stations. The markets of India and Pakistan are the consumers who take the lower-grade export products (around 5 500 kcal/kg), while the higher-grade material is targeted at Japan and Korea. The competition for this supply is mainly from Australia and Indonesia, who both have a well-developed coal exporting infrastructure and are closer to these markets.

17.5.2. Domestic Power Station Market

The domestic coal market is made up of established long-term power station contracts (often by means of dedicated supply mines) and shorter contracts to make up the supply deficiencies, usually sourced from smaller-scale operators. Most of the Company's mine infrastructure is geared towards the export market and is designed for large volumes. It is not profitable to generate the separate smaller-volume products, except where the secondary wash plants exist, creating a product that can be switched between markets. These products are best managed as supply from the existing MRDs and tailings facilities, through a third party. The short-term nature of these contracts also does not encourage investment at the small scale that a third-party operator is better equipped to undertake.

Over time, the export market has been the fundamental driver of South African coal products (as demonstrated in Figure 17-3 below) but has stabilised over the last few years. For the next five to ten years the remaining export resources will come under pressure to be replaced and the infrastructure established to facilitate the exports will become further under-utilised. A plan to find suitable alternative resources or to adapt the export strategy even further to accommodate future constraints is required.



srk consulting	**GREENSIDE COLLIERY CPR** RSA Exports Share of Coal Market and Value *(Source: Chamber of Mines, 2018)*	Project No. 566644

Figure 17-3: RSA Exports Share of Coal Market and Value

18. Material Contracts

[SR5.6(i)(ii)(vi)]

18.1. Introduction

This section discusses material contracts which govern the allocation, transportation and shipping of export coal, as well as those services associated with the mining of the coal

Some examples of short-term contracts for the purchase and/or sale of coal are presented. The Company advised SRK that it does from time to time lease additional capacity for the transportation and shipping of export coal.

The mine is predominantly an electrical energy consumer with most of the diesel being used in the support vehicles underground. The other necessary services are contracted out apart from items such as mine planning, financial services, etc. The total cash cost of operations is approximately ZAR1 600 million per annum and most of the service expenditure is procured under contracts procured via tenders.

18.2. Transnet Freight Rail

THE Company signed an agreement with Transnet SOC Limited acting through its Transnet Freight Rail Division (**TFR**) for the transportation of coal to the RBCT. The agreement commenced on 1 April 2014 and runs for ten years to 31 March 2024. The agreement can be extended by mutual agreement.

In terms of the contract, the contracted tonnage allocated to AOPL is 19.08 Mtpa, being 23.56% of the stated rail capacity of 81 Mtpa. Of this contracted tonnage, 18.13 Mtpa is referred to as committed tonnage, with the balance of 0.95 Mtpa allocated to emerging miners (uncommitted tonnage, at 5% of contracted tonnage). To the extent that the uncommitted tonnage is not used in any given year, AOPL can utilise that capacity.

The contract operates on a “take or pay” basis, except where the transport services offered by TFR exceed the contracted tonnage. If the volume of coal railed on behalf of AOPL is less than 95% of the contracted tonnage in a contract year, AOPL is liable to pay an unutilised capacity charge according to a formula.

AOPL will be liable for certain additional charges, where:

- Overloading – the mass of coal on a wagon exceeds its maximum carrying capacity by 2 t;
- Underloading – the mass of coal on a wagon is more than 10 t below its maximum carrying capacity; and
- Train handling time (**THT**) for each site – the time taken to handle a train, i.e. from the time the train is delivered by TFR until the time it is collected again, exceeds the agreed THT for a given site per the lower of the THT agreed in the service level agreement (**SLA**) or four hours. This is a charge per hour or part thereof.

Per Annexure B of the agreement, the Company specified five loading sites at which its export tonnage will be loaded (Table 18-1). The Company reviews the distribution of capacity to each nominated loading site annually based on the business plan and the capacity at each loading site.

Table 18-1: Specified Loading Sites

Loading Site	Coal Allocation (Mtpa)	Coal Allocation as percentage of Contracted Tonnage (%)
Phola – 743345	4.96	26.0
SACE – 750735	8.29	43.5
Bank – 751405	2.21	11.6
Goedehoop - 754986	2.53	13.3
Mafube – 749907	1.06	5.6
Total	**19.05**	**100**

A different rail tariff was specified for the first contract year for each site. The annual rail tariff price escalation is based on:

- An index escalation based on a formula comprising PPI (64%), labour (22%), steel price (7%), electricity (5%) and diesel (2%); plus
- A capital related tariff adjustment (an adjustment based on the increase or decrease in actual Capex spent relative to the projections set out in TFR's feasibility study done at the time the agreement was signed).

18.2.1. Leased TFR allocation

The Company signed an agreement with SA Coal Mining Holdings Ltd (**SACMH**) for the lease of 500 kt (to the nearest train load) of TFR capacity for the period 27 January 2020 to 31 January 2021. The leased entitlement equates to five 8 300 t trains per month, or 60 jumbo train loads.

The Company pays SACMH a fixed rate in USD/t for the TFR leased entitlement, based on the mass calculated by RBCT when the coal is offloaded.

18.2.2. RBCT Entitlement Agreements

AAIC leased up to 5 Mtpa of TFR entitlement from the Company via two agreements, signed in 2007 and 2012 (cf. Section 18.3.2).

18.3. Richards Bay Coal Terminal

The Company was one of seven coal exporting companies that were involved in Phase 1 of the development of the RBCT. The Company participated in each phase up to and including the Quattro Optimisation Project (Table 18-2), in the process securing a linked entitlement of 20.88 Mtpa. This entitlement grants the Company six allocated grades of coal it can export and 16 allocated stockpiles. In terms of RBCT rules, there has to be a minimum of two stockpiles per grade of coal exported, with each stockpile being a minimum of 30 000 t and a maximum of 120 000 t.

Table 18-2: Phased Development of RBCT

Phase	Commissioning Date	Design Capacity Increase (Mtpa)	Total Design Capacity (Mtpa)	Number of Coal Grades	Company Participation
	April 1976	12.0	12.0		Yes
Phase II	September 1978	12.0	24.0		Yes
Phase III	October 1984	20.0	44.0		Yes
Phase III Upgrade	August 1993	19.0	63.0		Yes
Brownfields expansion	April 2000	9.0	72.0	30	Yes
Quattro Optimisation Project	January 2009	4.0	76.0	34	Yes
Phase V expansion	May 2010	15.0	91.0	38	No

RBCT operates on a commercial breakeven basis whereby it recovers its operating costs from the shareholders based on tonnages of coal exported. In terms of the shareholders' agreement, each shareholder is required on a "use or pay" basis to export a minimum annual tonnage of coal through the terminal based on its linked entitlement and committed annual tonnage usage (**CATU**).

RBCT recovers its costs via a wharfage fee, which comprises:

- **An operating charge:** a cost per tonne loaded into ships, calculated as the total actual cost incurred by RBCT to operate the terminal divided by the greater of the actual tonnage loaded into ships and the aggregate CATU for that year;

- **An interest charge:** the interest and costs incurred in connection with loans raised by RBCT to finance the respective development phases. The total interest charge for each year shall be allocated to the applicable participating shareholders in relation to the applicable phase pro rata according to the applicable participation ratios;
- **A capital charge:** participating shareholders in any development phase incur a capital charge in respect thereof pro rata to their respective participation ratios;
- All shareholders incur a capital charge equal to the cost of amortising assets in proportion to the amounts contributed by shareholders; and
- **A usage surcharge:** an additional charge that arises where one or more users do not achieve their respective CATUs.

A shareholders' agreement was signed by all shareholders in RBCT on 24 July 2013 to amend and restate the prior versions of the shareholders agreement with effect from the effective date of 12 April 2013, without prejudice to any accrued rights or obligations under any of the prior versions of this Shareholders' Agreement except where dealt with in the current agreement. The June 2013 agreement also sought to align a revised memorandum of incorporation for RBCT with the Companies Act and prior shareholders' agreements.

18.3.1. Leased RBCT Allocation

The Company signed an agreement with SACMH for the lease of 500 kt of RBCT capacity for the period 27 January 2020 to 31 January 2021. As part of the leased entitlement, the Company is assigned two 30 000 t stockpiles at RBCT.

If the Company wishes to use SACMH's designated stockpiling areas, only RB1 specification coal can be exported, as this is governed by SACMH's participation in the Phase V Expansion of the RBCT. The Company indicated that it prefers to use its own stockpiling areas, as this enables it to have better control over its coal.

The Company pays SACMH a fixed rate in USD/t for the RBCT leased entitlement, according to the mass of coal as offloaded and measured at RBCT.

18.3.2. RBCT Entitlement Agreements

First RBCT Entitlement Agreement

The Company signed a RBCT entitlement agreement with AAIC on 27 November 2007 whereby the Company granted a leased entitlement to AAIC of 2 Mtpa of both its RBCT and TFR capacity for 18 years. The leased entitlement was premised on the Company's RBCT entitlement of 19.44 Mtpa and TFR entitlement of 19.8 Mtpa. If AAIC does not achieve 90% of the leased entitlement (the guaranteed tonnage), it will pay as if it had achieved the guaranteed tonnage.

AAIC pays a rental charge which comprises the RBCT operating charge (as ZAR/t) plus an annual fixed non-operational charge expressed in ZAR/t, times the leased entitlement.

The agreement refers to coal produced at Zondagsfontein and the loading site used by Zibulo.

The Company undertook to provide the 2 Mtpa rail capacity, either as a lease of part of the Anglo rail entitlement, or by procuring an agreement between AAIC and Spoornet or other entitled party.

Second RBCT Entitlement Agreement

The Company signed an additional RBCT entitlement agreement with AAIC on 2 April 2012 which continues to 31 December 2029. The agreement can be terminated if either party is no longer part of the Anglo Group.

This agreement grants AAIC an additional leased entitlement of up to 3 Mtpa for Zibulo, which has to be reserved two months before the beginning of any year. If AAIC does not use all the reserved additional leased entitlement, it will have to pay as if it had used all that additional tonnage.

AAIC pays a rental charge which comprises a RBCT operating charge (as ZAR/t) plus an annual fixed additional non-operational charge priced in USD/t, times the additional leased entitlement.

AAIC is responsible for any penalties levied by RBCT due to impurities in its coal, hot coal (>40°C) and dusty coal. All conditions applicable to RBCT shareholders, such as the “equal pain principle”, apply equally to AAIC.

The additional leased TFR entitlement remains with AOPL, but on a full cost and liability recovery basis payable by AAIC to the Company. In addition, AAIC assumes all the Company’s responsibilities regarding liaison with TFR for the additional entitlement.

18.4. Volume Allocations

Given the TFR and RBCT capacities to which the Company is entitled, the volumes of production, railings and sales for the respective collieries have to be carefully managed and allocated.

This however gives the Company the flexibility to modify the production mix from the collieries to take advantage of changes in market demand for different coal product qualities.

18.4.1. Production

Historical production volumes by colliery and product type for 2017 to 2019 and first half of 2020 (**H1-2020**) are set out in Table 18-3.

Table 18-3: Historical Production Volumes per Colliery

Colliery / Product	Units	2017	2018	2019	2020
Goedehoop Primary Export	(Mt)	4.65	3.45	3.05	2.13
Goedehoop Secondary Export	(Mt)			0.90	
Goedehoop Domestic	(Mt)		1.99	2.12	3.82
Goedehoop Total	(Mt)	4.65	5.44	6.07	5.96
Greenside Primary Export	(Mt)	3.23	3.41	3.40	3.07
Greenside Secondary Export	(Mt)			0.13	0.54
Greenside Domestic	(Mt)	0.60	1.04	1.32	0.97
Greenside Total	(Mt)	3.83	4.45	4.85	4.58
Zibulo Primary Export	(Mt)	4.69	4.34	3.52	3.30
Zibulo Secondary Export	(Mt)			1.81	2.15
Zibulo Domestic	(Mt)	1.55	2.04	0.03	
Zibulo Total	(Mt)	6.23	6.38	5.36	5.45
Khwezela Primary Export	(Mt)	2.86	2.33	1.64	2.61
Khwezela Secondary Export	(Mt)			1.00	0.79
Khwezela Domestic	(Mt)	2.85	3.20	3.12	3.11
Khwezela/Landau Total	(Mt)	5.71	5.53	5.76	6.51
Mafube Primary Export	(Mt)	1.56	0.78	1.15	1.19
Mafube Secondary Export	(Mt)				0.63
Mafube Domestic	(Mt)		0.37	0.65	
Mafube Total	(Mt)	1.56	1.15	1.80	1.82
Total Company Production	**(Mt)**	**21.98**	**22.95**	**23.84**	**24.32**

Note:
1. The figures for 2020 are based on actual data for January – September and forecast estimates for October – December.

18.4.2. Rail Shipments

The historical railed coal volumes by colliery for 2017 to 2020 are set out in Table 18-4.

Table 18-4: Historical Railed Sales Volumes by Colliery

Railed	Units	2017	2018	2019	2020
Goedehoop Total	(Mt)	4.65	4.15	3.94	2.26
Khwezela South Total	(Mt)	1.15	1.42	1.94	2.01
Greenside Total	(Mt)	3.37	3.14	3.73	3.55
Zibulo Total	(Mt)	6.01	5.87	5.60	5.26
Khwezela North Total	(Mt)	2.03	1.34	0.84	1.46
Mafube Total	(Mt)	1.77	1.03	1.86	1.90
Sub-total - Company Railed	(Mt)	18.97	16.96	17.91	16.43
Third-party					
Third-party railed	(Mt)	0.27	0.92	1.69	1.62
Total - railed	(Mt)	19.24	17.87	19.61	18.06
Company entitlement	(Mt)	19.10	19.10	19.10	19.10
Additional entitlement	(Mt)			1.12	1.50
SAEC entitlement	(Mt)	0.41	0.29		
SACMH entitlement	(Mt)				0.20
TFR entitlement not used	(Mt)	0.27	1.52	0.61	2.74

Note:
1. The figures for 2020 are based on actual data for January – September and forecast estimates for October – December.

18.4.3. RBCT Sales

The historical export coal sales by colliery via RBCT for 2017 to 2020 are set out in Table 18-5.

Table 18-5: Allocated Sales Volumes by Colliery (ex RBCT)

Sales	Units	2017	2018	2019	2020
Goedehoop Total	(Mt)	4.45	4.37	3.92	2.30
Khwezela South Total	(Mt)	1.17	1.40	1.90	1.98
Greenside Total	(Mt)	3.31	3.3	3.75	3.45
Zibulo Total	(Mt)	4.63	4.34	3.65	3.14
Khwezela North Total	(Mt)	2.01	1.38	0.87	1.45
Mafube Total	(Mt)	1.76	1.17	1.79	1.86
Sub-total - Company sales	(Mt)	17.34	15.97	15.89	14.17
Third-party purchases	(Mt)	0.23	0.94	1.63	1.59
AOL Marketing	(Mt)	1.33	1.70	1.90	2.03
Sub-total - third-party sales	(Mt)	1.56	2.64	3.53	3.62
Total - sales	(Mt)	18.90	18.61	19.43	17.80
Company RBCT entitlement	(Mt)	19.80	19.80	19.80	19.80
Additional RBCT Optimum entitlement	(Mt)			3.16	3.16
SAEC entitlement	(Mt)	0.41	0.29		
SACMH entitlement	(Mt)				0.20
RBCT capacity used / (available)	(Mt)	-1.30	-1.49	-3.53	-5.36

Note:
1. The figures for 2020 are based on actual data for January – September and forecast estimates for October – December.

The total sales in each period in Table 18.5 did not fully utilise the entitlement available to the Company

18.5. Short-term Contracts

The Company uses two forms of short-term contracts, viz. coal purchase agreements and domestic coal sales agreements.

18.5.1. Coal Purchase Agreements

Examples of short-term coal purchase agreements in Table 18-6 show the type of coal, contract duration, contracted volume, selected coal specifications, selected price adjustment criteria and the delivery point. As coal purchases are linked to the export price, the Company uses short-term contracts to mitigate the volatility in the export coal prices.

18.5.2. Domestic Coal Sales Agreements

Examples of short-term domestic coal sales agreements in Table 18-7 show the type of coal, contract duration, contracted volume, selected coal specifications, selected price adjustment criteria and the delivery point.

The Company uses short-term sales contracts to cater for flexibility in pricing and balance security of demand.

18.6. Coal Marketing

The coal is typically supplied under an export contract that is normally based on a standard-type export contract that dictates supply price, qualities, etc. These contracts are normally based on delivery as free on board; however, in some cases they can be concluded at different delivery points. There are no specific long-term customers and most export customers prefer to have shorter term contracts to maintain their flexibility of supply in terms of volume and quality. Some coal is also sold on the export market through the coal trading platforms and the contract arrangements will then be those as applied per the trading platform.

On the domestic front, some coal is sold to Eskom but is mostly done through Black Empowered nominees who have their own contracting arrangements with domestic suppliers. The arrangement between the Company and the nominees is then as a coal supplier arrangement and is mostly done from the MRDs.

Table 18-6: Examples of Purchase Agreements

Coal Type	Contract Duration	Contract Volumes (kt)	Selected Coal Specifications			Price Adjustments	Delivery Basis
			Size (mm)	CV[1] (kcal/kg)	Total Moisture (%)		
4 800 kcal/kg (NAR) coal	Feb - Apr'20 (completed)	51	<30% -3 <10% -0.5	Min 4 600	Max 12%	CV[1]: <4 600 TM: 1% of price for each 1% >12% S: variable, sliding scale	Delivered to Woestalleen Siding
RB3 5 500 kcal/kg	Feb – Jul'20	102	<25% -3 <10% -0.5	Min 5 300	Max 12%	CV[1]: <5 300 TM: 1% of price for each 1% >12% S: 1% of price for each 0.1% above 1%	Delivered to Woestalleen Siding
5 500 kcal/kg (NAR)	Oct'19-Mar'20 (completed)	72	<30% -3 <10% -0.5	Min 5 300	Max 14%	CV[1]: <5 300 TM: 1% of price for each 1% >14% S: 1% of price for each 0.1% above 1%	Delivered to Richards Bay
4 800 kcal/kg (NAR)	Dec'19-May'20 (completed)	72	<30% -3 <10% -0.5	Min 4 600	Max 12%	CV[1]: <4 600 TM: 1% of price for each 1% >12% S: 1% of price for each 0.1% above 1%	Delivered to Richards Bay
4 800 kcal/kg (NAR)	Mar – Aug'20	102	<25% -3 <10% -0.5	Min 4 600	Max 12%	CV[1]: <4 600 TM: 1% of price for each 1% >12% S: 1% of price for each 0.1% above 1%	Delivered to Blinkpan Siding
RB3 5 500 kcal/kg	Feb'20–Jan'21	144	<25% -3 <10% -0.5	Min 5 300	Max 14%	CV[1]: <5 300 TM: 1% of price for each 1% >12% S: variable, sliding scale	Delivered to Blinkpan Siding
4 800 kcal/kg (NAR)	Dec'19-Nov'20	144	<30% -3 <10% -0.5	Min 4 600	Max 12%	CV[1]: <4 600 TM: 1% of price for each 1% >12% S: variable, sliding scale	Delivered to Highveld Siding and RLT
5 500 kcal/kg	Jan - Dec'20	144	<30% -3 <10% -0.5	Min 5 300	Max 12%	CV[1]: <5 300 TM: 1% of price for each 1% >12% S: variable, sliding scale	Delivered to Highveld Siding
4 800 kcal/kg (NAR)	Jan - Dec'20	216	<30% -3 <10% -0.5	Min 4 600	Max 12%	CV[1]: <4 600 TM: 1% of price for each 1% >12% S: variable, sliding scale	Delivered to Highveld Siding
4 800 kcal/kg (NAR)	Feb'20-Jan'21	144	<30% -3 <10% -0.5	Min 4 600	Max 14%	CV[1]: <4 600 TM: 1% of price for each 1% >14% S: variable, sliding scale	Delivered to Blinkpan Siding or Derwent Siding

Table 18-7: Examples of Domestic Coal Sales Agreements

Colliery (Coal Type)	Contract Duration	Contract Volumes (kt)	Selected Coal Specifications			Price Adjustments	Delivery Basis
			Size (mm)	CV[1] (MJ/kg)	Total Moisture (%)		
Khwezela (Umlalazi A grade duff)	Jan'19-Dec'20	168	<10% +12 <12.5% -0.5	27.2 (26.5 – 27.6)	7.0 (5.0 – 8.5)	CV[1]: <26.5 or >27.8 TM: <5% or >8.5%	On rail truck at Hayford Siding
Khwezela (Umlalazi A small nuts)	Jan – Mar'20 (completed)	3	<10% +50 <12.5% -25	27.0 (26.5 – 27.6)	7.0 (5.0 – 9.0)	Size: >12.5% -25 CV[1]: <26.5 or >27.2	On rail truck at Hayford Siding
Khwezela (Umlalazi RoM 4-Seam top coal uncrushed	Jan – Mar'20 (completed)	45	-	18	8.0	-	On road truck at mine site
Greenside (PRE Middling)	Jan – Mar'20 (completed)	15	<12.5% -3 <10% -0.5	21.7 Min 21.5	10	Size: >12.5% -3 CV[1]: <26.5 or >27.2	On road truck at mine site
Khwezela (Landau 3 MRD, either or both Goedehoop North (Bank) MRD untreated, unwashed	Sep'18-Aug'19 (completed)	1 440	- -	14.25 13.65	4.7 8.0	-	On road truck at mine site
Greenside filter cake	Feb – Mar'20 (completed)	1.5	-	19.5	21.0	-	On road truck at mine site
Khwezela (Umlalazi A grade peas)	Oct'19- Dec'20	105	<10% +35 <12.5% +10	27.2 (26.5 – 27.8)	7.0 (5.0 – 8.0)	TM: <5.0% or >8.0% CV[1]: <26.5 or >27.8 Size: >12.5% -10	On rail truck at Hayford Siding
Khwezela (Umlalazi M3 middling)	21-29 Feb'20 (completed)	2.5	-	22.5 (21.5 – 23.5)	7.0 (5.0 – 8.5)	CV[1]: <21.5 or >23.5	On road truck at mine site
Khwezela (Umlalazi A grade duff)	Jan - Dec'20	30	<10% +12 <12.5% -0.5	27.2 (26.5 – 27.6)	7.0 (5.0 – 8.5)	CV[1]: <26.5 or >27.8 TM: <5% or >8.5%	On rail truck at Hayford Siding, or on road truck at mine site
Khwezela (Landau 3 MRD) Unwashed, untreated	Feb – Mar'20 (completed)	40	-	Main 16.25 Bottom 14.10 Lens 10.82	-	-	On road truck at mine site
Greenside MRD unwashed, untreated	Aug'19–Jul'20	180	-	18.15	3.2	-	On road truck at mine site

The Company plans to enter into an exclusive offtake agreement with Anglo American Marketing Limited (**AAML**), a subsidiary of Anglo American, whereby AAML will purchase all saleable export coal produced by the Company. It is further envisaged that the Company will conclude a domestic marketing agreement with AAML (or a South African subsidiary of AAML), as well as a management services agreement in terms of which AAML can utilise any unused capacity on the Company's logistics (TFR/RBCT) channels. AAML will be able to source third-party coal to fill such unused capacity, which is expected to be cost-neutral to the Company.

The agreement will be for an initial term of three years, calculated with effect from the listing date of the Company. This will be followed by a period of two years in which the Company may put its volumes out to tender provided that AAML has the right to match any offers received by the Company from third parties. Neither party will have a right to extend the agreement beyond this period.

The marketing fee payable to AAML will be a percentage of the realised price of the coal. In the case of the export coal, the price realised will be the ruling price for API4 coal less an adjustment for the actual CV[1] of the exported coal and a discount (typically a USD/t amount) for the Ash content.

The three agreements are designed to ensure that the Company is demerged in a sustainable manner and provide a guaranteed offtake and secure cash flow generation for five years. It also enables the Company a transitional period to build capability and establish a standalone marketing function.

The current arrangements between the Company and AAML will continue as usual until the listing date. These arrangements are essentially the same as what are envisaged above.

18.7. Provision of Services

18.7.1. Joy/Sandvik Maintenance Contract

The mine has a contract with Joy Manufacturing and Sandvik for the servicing and maintenance of the mining equipment and the support equipment, respectively. Both these contracts cover the procurement of the stores necessary for the maintenance as well as the labour and other items required for the servicing of the equipment.

The expected expenditure on these contracts is in the order of ZAR90 million per annum on both contracts. The contracts have provision for annual escalation and other items such as exchange rate, etc.

18.7.2. Power and Diesel Supply

The diesel supply is under a single contract and the annual expenditure is approximately ZAR12 million per annum. A small supply is kept at the mine, but the main supply is managed from a depot in Witbank.

The power supply is the largest supply item and is managed through a customer contract with Eskom. The net expenditure on this is approximately ZAR120 million per annum.

18.7.3. Mining Supply

The main mining supply for the underground is the provision of mining support in the form of roof bolts and associated accessories for roof support. This is done through a single contract and the estimated annual expenditure is around ZAR15 million. The other key supply is for stonedust, which is a smaller contract of approximately ZAR5 million value. The underground conveyor belts are also a major supply item of approximately ZAR28 million per annum, but this is split into multiple purchase contracts as the suppliers of the motors, gearboxes, belting, etc are different. This applies to the plant conveyors; the balance of the plant maintenance cost is similarly procured under several smaller supply contracts. The net value of the plant procurement is approximately ZAR30 million, split between several contracts.

18.7.4. Equipment Hire

The contract for the mining and delivery of the discard material to the No 5 Seam plant covers most of the equipment hire, with a value of approximately ZAR30 million per annum.

Table 18-8: Greenside Colliery's Main Contracts

Contract	Estimated Annual Value (ZARm)
Joy/Sandvik Maintenance Contract	90
Power and Diesel Supply	12
Mining Supply:	
Roof bolts	15
Stonedust	5
Underground conveyor belts	28
Plant procurement	30
Equipment hire	30

18.8. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

18.8.1. Risks

Potential risks associated with the TFR and RBCT contracts are the "take or pay" basis of the contracts. If the Company does not use the full contracted volume per year, the TFR logistics cost and the RBCT charge incorporated into the cash flow model for each export colliery may be understated.

The CPR reflects the proposed principles to be incorporated into the coal marketing agreement, which has not yet been concluded. The marketing fee included into the cash flow model for each export colliery may be understated.

The mine has the ability to reduce the supply quality over the LoM to a 5 500 kcal/kg product to counter the potential declining yield of the coal but needs to do so with a clear understanding of the discounts applied to the lower grade products. The current plan has allowed a move in the last three years of the life of mine plan. This risk can be controlled by having sufficient planning to allow the trade-off between yield and price to be continually evaluated. The mine schedule does not have enough pit space to allow mining sections to high-grade the sequence to adapt to price variations. The mine is currently a high-productivity mine and is designed to maximise throughput to maintain profitability. There is some risk that as the lower mining heights are encountered there may be some loss of productivity, affecting the overall economic viability of the mine. This risk is countered by ensuring that the support services of coal clearance, beneficiation, ventilation, etc. are maintained at a high standard to ensure maximised cutting time.

The mine costs are optimised for the level of throughput achieved but are largely fixed costs; thus, the maximization of the mining tonnage is the key strategy to ensure the mine profitability is not impacted by the costs. In the short term, the power costs will be subject to tariff increases but not to the extent that they will affect the mine significantly and the security of supply of power, which is also a risk, is currently managed effectively.

18.8.2. Opportunities:

The Company purchases export quality coal from other producers from time to time to enable it to fulfil its obligations per the TFR and RBCT contracts.

Domestic coal sale agreements are generally done on an opportunistic basis and are of short duration. Such opportunistic sales have not been considered in the cash flow model for each colliery.

The mine has recently used the MRD to create additional value streams; the vast resource of MRD material should be investigated for producing ongoing domestic sales. Similarly, while the mine has been extensively mined out, there are areas that may still be shallow enough that a potential opencast pillar recovery option can be investigated for mine life extension.

19. Material Asset Valuation

[12.9(a)(i), [12.10(f), 12.10(h)(xii)] [SR5.6 (iii)(iv), SR5.8] [SV1.2, SV1.4, SV1.7, SV1.9, SV1.11, SV1.12, SV1.13, SV1.14, SV1.15, SV1.17, SV1.18, SV1.19]

The valuation of Greenside and the contained coal deposits has been prepared in accordance with the SAMVAL Code (2016) and is reported at the Valuation Date (which is also the Effective Date) of this CPR, viz. 31 December 2020.The TEM has been independently constructed by Ms V Snyman of Cornerstone Infrastructure Advisors using the TEPs as provided by Mr N McGeorge of SRK, which commence on 1 January 2021. The transactions have been identified and reviewed by Mr A van Zyl of SRK who has, based on the outputs of the TEM and his interpretation of the transactions used for the Market Approach, developed an opinion on the value of the assets and signed off on the valuation. The value is intended to reflect the Market Value of the asset on a third-party arms-length basis and no restriction was placed on the valuation.

Compensation was not contingent on the outcome of the valuation and neither Ms Snyman nor Mr Van Zyl have any interest in the assets.

19.1. Valuation Approaches and Methods

[(12.10(a)] [SV1.12] [SR5.6(iv)]

19.1.1. Valuation Approaches

There are three main and generally accepted analytical valuation approaches that are in common use for determining the “Fair Market Value” of mineral assets, each of which is described below, and which largely rely on the principle of substitution, using market derived data. The three generally accepted approaches to mineral asset valuation, as given in Section 3.3 of the SAMVAL Code are:

- Income Approach - The Income Approach relies on the ‘value-in-use’ principle and requires determination of the present value of future cash flows over the useful life of the Mineral Asset;
- Market Approach - The Market Approach relies on the ‘willing buyer, willing seller’ principle and requires that the monetary value obtainable from the sale of the Mineral Asset is determined as if in an arm’s-length transaction. The application of certain logic in Mineral Asset Valuation, such as ‘gross in-situ value’ simply determined from the product of the estimate of mineral content and commodity price(s), is considered unacceptable and inappropriate; and
- Cost Approach - The Cost Approach relies on historic and/or future amounts spent on the Mineral Asset, and is a valuation approach based on the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction.

The applicability of the three valuation approaches to the different property types as set out in the SAMVAL Code is shown in Table 19-1.

Table 19-1: Applicability of Valuation Approaches to Property Types

Valuation Approach	Early Stage Exploration	Advanced Stage Exploration	Development Properties	Production Properties	Dormant Properties		Defunct Properties
					Economically Viable	Economically Not Viable	
Income	Not generally used	Not generally used	Widely used	Widely used	Widely used	Not generally used	Not generally used
Market	Widely used	Widely used	Less widely used	Quite widely used	Quite widely used	Widely used	Widely used
Cost	Widely used	Widely used	Not generally used	Not generally used	Not generally used	Less widely used	Quite widely used

The SAMVAL Code requires that at least two valuation approaches must be applied and the results from the valuation approaches and methods must be weighed and reconciled into a concluding opinion on value. SRK has determined the Technical Value for Greenside utilizing the Market Approach and Income Approach.

The Market Approach or "Fair Market Value" in respect of a Mineral Asset is defined as the amount of money (or the cash equivalent of some other consideration) determined by the relevant expert for which the Mineral Asset or Security should change hands on the Valuation Date in an open and unrestricted market between a willing buyer and a willing seller in an "arm's length" transaction, with each party acting knowledgeably, prudently and without compulsion. The "fair market value" of a mineral asset usually comprises two components: the underlying or "technical value" of the assets and a premium or discount relating to market, strategic and other considerations. The fair market value is therefore more likely to fluctuate with time.

The Income Approach or "Technical Value'" in respect of a Mineral Asset is derived from the future net economic benefit at the Valuation Date under a set of assumptions deemed most appropriate by an Expert or Specialist, excluding any premium or discount to account for factors such as market or strategic considerations. The Income Approach relies on the 'value-in-use' principle and requires determination of the present value of future cash flows over the useful life of the Mineral Asset.

The currency of valuation used in this report is South African Rand (ZAR). As this CPR will be used for both the JSE and LSE, the USD equivalent is also provided.

19.1.2. Materiality

[SV1.10]

The SAMVAL Code definition for materiality requires that a public report contains all the relevant information that investors and their professional advisors would reasonably require, and expect to find, for the purpose of making a reasoned and balanced judgement regarding the mineral asset valuation.

The determination of what may be material depends on both qualitative and quantitative factors. Something may be material in the qualitative sense because of its very nature, e.g., country risk. In the case of quantitative issues in this CPR, SRK considers that if omission or inclusion of an item could change the value or post-tax pre-finance annual operating cash flow by more than ten per cent (10%), the item is material and would have to be included.

19.1.3. Transparency

In terms of the SAMVAL Code, the reader of a Public Report (this CPR) must be provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and not be misled.

19.2. Valuation – Income Approach

[SV1.12, SV1.14] [SR5.6(iv), SR5.8(ii)(iii)(iv)]

The most widely used valuation method for pre-development, development and operating mines is the discounted cash flow (**DCF**).

This method considers the majority of factors that can influence the value of a business enterprise, including expected changes in the mineral asset or property's operating activity. Under this approach, it is necessary to utilize projections of revenues, Opex, depreciation, income taxes, Capex and working capital requirements. The present value of the resulting cash flows provides an indicated value of the operating business enterprise.

In order to eliminate the impact on value of the different long-term financing arrangements that have been or could be implemented, analysis is generally done on a debt-free basis. The **NPV** of the projected post-tax pre-finance cash flows, using either mid-year or end-year discounting, provides an indication of the value for the mineral asset or property appraised. This NPV will need to be adjusted to take into account any debt or cash at the Valuation Date to derive the net value of the property or asset.

SRK compiled a TEM for Greenside which incorporates LoM production schedules for the mine within the licence areas. The TEPs in the TEM have been compiled by SRK as outlined in this report. The TEM parameters and Modifying Factors were used to construct an independent cash flow model in constant money terms.

19.2.1. Summary of the TEPs

[SR1.6(i)]

The key TEPs and output from the Greenside TEM are summarised in Table 19-2 for the period 2021 to 2026 which represents the LoM. As the mine is in South Africa, the TEPs are presented in ZAR to enable the MPRDA royalty and company tax for Greenside to be calculated correctly.

The TEM is presented on a 100% equity basis in constant-money terms, so that interest and debt-servicing is not considered in the cash flows.

Royalties in terms of the Royalty Act are based on the unrefined minerals formula.

For the working capital movement calculation, SRK has taken accounts receivable and accounts payable to be 30 days and 60 days respectively. Inventories have been excluded from this calculation. The opening working capital balance as at the Valuation Date is ZAR264 million (or USD18.0 million) based on accounts receivable and accounts payable at 31 December 2020.

The Company provided the following inputs as at 31 December 2020, which were used in the tax calculation:

- No reported accumulated tax loss;
- Unredeemed capital of ZAR752 million (USD51.2 million); and
- Unredeemed Capex in terms of calculating the Royalty Tax of ZAR809 million (USD55.0 million).

Provision for mine closure has been made as follows:

- Estimated Scheduled Mine Closure Cost ZAR386 million (USD26.1 million) plus provision for water treatment cost ZAR20 million (USD1.4 million) plus provision for dump covers ZAR250 million (USD17.0 million) less the balance in Trust Account as at the Valuation Date ZAR383 million (USD26.1 million). This has been provided for annually on a ZAR/t RoM basis over the remaining period of the LoM; and
- Separation Benefit of ZAR198 million (USD13.5 million) provided for based on 1 week's benefit for every year of service assuming an average of 15 years' service. This has been provided for equally in the last two years of operation.

The forecast API 4 coal prices and ZAR:USD exchange rates used in the Greenside TEM are as provided by Wood Mackenzie (2021) in Table 17-1. A heat adjustment was made for the respective products and discounts of 2.1% and 18% have been applied to the 5 800 and 4 800 kcal/kg saleable products, respectively. In addition, a provision of USD1 per saleable tonne to account for an ash discount was deducted from the sales price.

A marketing fee of 1% has been applied to total revenue.

SRK has reviewed the historical operating costs and production statistics to confirm that the projections in the TEM are reasonable (refer to Figure 8-12 and Section 8.7). The summary operating costs are included in Table 19-2.

The resultant post-tax pre-finance cash flows are then converted to US Dollars according to spot exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

Table 19-2: Summary of the TEM

Parameter	Units	LoM	2021	2022	2023	2024	2025	2026
Mining (RoM)	(Mt)	27.7	5.1	5.2	5.2	5.3	4.8	2.1
Sales								
Export - 5800 product	(Mt)	17.9	3.7	3.3	3.1	3.4	3.1	1.4
Export - 4800 product	(Mt)	1.4	0.3	0.4	0.3	0.2	0.2	0.1
Domestic - Eskom 5 Seam (AR)	(Mt)	0.8	0.4	0.4				
Discard treated	(Mt)	1.3	0.7	0.7				
Total Rail Volume (AR)	(Mt)	20.5	4.2	3.9	3.6	3.8	3.5	1.6
Sales Prices								
RB1 Base coal price	(USD/t)		85.2	82.4	80.7	79.0	79.3	79.4
Export - 5800 product	(USD/t)		79.6	77.0	75.4	73.8	74.0	74.1
Export - 4800 product	(USD/t)		54.9	53.1	51.9	50.8	51.0	51.1
Domestic - Eskom 5 Seam (AR)	(ZAR/t)		365.0	365.0	365.0	365.0	365.0	365.0
Discard treated	(ZAR/t)		45.0	45.0	45.0	45.0	45.0	45.0
Foreign Exchange Rate								
USD:ZAR	(rate)		16.2	15.6	15.0	13.8	13.8	13.8
Capital Costs								
SIB Capital	(ZARm)	(436)	(232)	(169)	(35)			
Operating Cost								
Mining	(ZARm)	(7 232)	(1 279)	(1 277)	(1 289)	(1 314)	(1 276)	(797)
Labour	(ZARm)	(3 885)	(686)	(686)	(686)	(686)	(686)	(457)
Stores	(ZARm)	(793)	(131)	(137)	(144)	(155)	(148)	(78)
WCS	(ZARm)	(858)	(147)	(151)	(155)	(162)	(159)	(83)
Contractors	(ZARm)	(1 448)	(271)	(259)	(260)	(267)	(239)	(152)
AAC Reimbursables	(ZARm)	(248)	(44)	(44)	(44)	(44)	(44)	(27)
Processing	(ZARm)	(243)	(39)	(41)	(43)	(46)	(45)	(30)
Services	(ZARm)	(2 064)	(373)	(368)	(368)	(371)	(359)	(225)
Total Operating Cost	(ZARm)	(9 539)	(1 691)	(1 685)	(1 701)	(1 731)	(1 680)	(1 052)
Cost per ROM tonne	(ZAR/t)		329	326	327	325	352	494
Rail and RBCT Wharfage	(ZAR/t)		215	215	215	215	215	215
Cash Flow								
Export Revenue	(ZARm)	21 325	4 973	4 231	3 713	3 568	3 319	1 520
Domestic Revenue	(ZARm)	351	175	175				
Royalty tax	(ZARm)	(593)	(150)	(163)	(111)	(92)	(72)	(6)
Carbon Tax	(ZARm)	(29)	(2)	(2)	(6)	(6)	(9)	(4)
Operating Cost	(ZARm)	(9 539)	(1 691)	(1 685)	(1 701)	(1 731)	(1 680)	(1 052)
Rail and RBCT Wharfage	(ZARm)	(4 410)	(893)	(829)	(771)	(816)	(755)	(345)
Capital expenditure	(ZARm)	(436)	(232)	(169)	(35)			
Change in working capital	(ZARm)	(264)	(408)	60	64	17	15	(12)
Company Tax	(ZARm)	(1 471)	(372)	(410)	(280)	(234)	(175)	
Closure cost	(ZARm)	(272)	(51)	(51)	(51)	(52)	(47)	(21)
Separation benefit	(ZARm)	(198)					(99)	(99)
Cashflow	**(ZARm)**	**4 247**	**1 300**	**1 115**	**785**	**618**	**465**	**(35)**

19.2.2. Weighted Average Cost of Capital

The weighted average cost of capital (**WACC**) for the Company has been derived according to the parameters set out in Table 19-3. As the Company intends to have its primary listing on the JSE, the WACC has been calculated according to parameters ruling in the Republic of South Africa.

Table 19-3: Derivation of the ZAR-denominated WACC for the Company

Parameter	Value	Source / Comment
Un-levered (asset) beta	1.004	Median of selected peer producers
Re-levered beta	1.314	Unlevered beta x [1+[(debt/Mkt equity value) x (1 – tax rate)]]
Equity risk premium	7.90%	SA Risk equity premium from: http://www.market-risk-premia.com/za.html and https://www.statista.com/statistics/664880/average-market-risk-premium-south-africa/
Risk free rate	9.26%	RSA 10-yr bond from: http://www.worldgovernmentbonds.com/country/south-africa/
Cost of equity	19.64%	Risk free rate + [(levered beta) x (market risk premium)]
Base rate	3.88%	3-month JIBAR from: https://www.resbank.co.za/Research/Rates/Pages/CurrentMarketRates.aspx
Credit spread	3.50%	Assumed to be less than bond spread. 10 Years vs 2 Years bond spread is 433 basis points from: http://www.worldgovernmentbonds.com/country/south-africa/
Pre-tax cost of debt	7.38%	Base rate + Credit spread
Tax rate (RSA)	28.00%	SA corporate tax rate
After tax cost of debt	5.31%	
Equity	70%	
Debt	30%	Company targeted leverage
WACC (nominal)	15.34%	
WACC (real)	**10.70%**	forecast CPI to average 4.2% for 2020, from: https://www.focus-economics.com/country-indicator/south-africa/inflation

The real WACC to apply to the ZAR-denominated cash flows for Greenside is therefore 10.7%.

19.2.3. Sensitivities

[SR5.8(iii)(iv) [SV1.14]

The following tables present the NPVs of the constant money post-tax pre-finance cash flows as determined from the TEM. In summary they include the following:

- The variation in constant money NPV with discount factors (Table 19-4);
- The variation in constant money NPV at the WACC with twin API4 price and foreign exchange rate sensitivities (Table 19-5); and
- The variation in constant money NPV at the WACC based on twin revenue and operating expenditure sensitivities (Table 19-6).

Table 19-4: Variation of Constant-Money NPV with Discount Rates (real)

Discount Rate	NPV (ZARm)	NPV (USDm)
9%	3 456	235.0
10%	3 384	230.1
10.7% (WACC)	**3 335**	**226.8**
11%	3 314	225.4
12%	3 247	220.8
13%	3 182	216.4

Table 19-5: Variation in Constant Money NPV (ZARm) at the 10.7% WACC based on Twin Sensitivities (API4 price and Foreign Exchange Rate)

			Long Term average API 4 Price							
			68	**72**	**76**	**80**	**84**	**88**	**92**	**96**
			-15.0%	**-10.0%**	**-5.0%**	**0.0%**	**5.0%**	**10.0%**	**15.0%**	**20.0%**
Average Long Term Exchange Rate	**12.38**	**-10.0%**	843	1 340	1 819	2 297	2 774	3 250	3 720	4 182
	13.06	**-5.0%**	1 304	1 809	2 313	2 816	3 318	3 811	4 298	4 785
	13.75	**0.0%**	1 748	2 278	2 807	**3 335**	3 852	4 364	4 876	5 387
	14.44	**5.0%**	2 190	2 745	3 299	3 842	4 380	4 917	5 453	5 988
	15.13	**10.0%**	2 632	3 212	3 782	4 345	4 907	5 468	6 029	6 589
	15.81	**15.0%**	3 073	3 672	4 260	4 847	5 434	6 019	6 604	7 189
	16.50	**20.0%**	3 512	4 125	4 737	5 349	5 960	6 570	7 179	7 788

Table 19-6: The Variation of Constant Money NPV (ZARm) at the 10.7% WACC based on Twin Sensitivities (Revenue and Operating Expenditure)

	Percentage	Revenue Sensitivity				
		-10.0%	**-5.0%**	**0.0%**	**5.0%**	**10.0%**
Operating Cost Sensitivity	**-10.0%**	2 741	3 268	3 781	4 294	4 806
	-5.0%	2 509	3 038	3 560	4 073	4 585
	0.0%	2 278	2 807	**3 335**	3 852	4 364
	5.0%	2 046	2 575	3 104	3 631	4 143
	10.0%	1 814	2 344	2 872	3 400	3 922

In the range of Foreign Exchange Rate and API4 RB1 Price sensitivity, the following is seen from Table 19-5:

- At an API4 RB1 Price and USD:ZAR 5% decrease or depreciation the NPV at 10.7% varies between ZAR2 313 million; and
- At an API4 RB1 Price and USD:ZAR 5% increase or appreciation the NPV at 10.7% ZAR4 380 million.

In the range of ±5.0% for the Revenue and Opex sensitivity, the following is seen from Table 19-6:

- Revenue: The NPV at 10.7% varies between ZAR2 807 million to ZAR3 852 million; and
- Opex: The NPV at 10.7% varies between ZAR3 104 million and ZAR3 560 million.

In aggregate, this suggests a range in values per the Income Approach of ZAR2 955 million to ZAR3 706 million.

A further sensitivity was undertaken to assess the risk and impact on the NPV in respect of potentially higher or additional closure costs. In this sensitivity the upper limits of the water treatment cost (ZAR70 million), dump covers ZAR350 million and a provision of R50 million for the Clydesdale pan was included. The impact on the NPV at the 10.7% WACC was a reduction of ZAR121 million resulting in an NPV of ZAR3 214 million.

SRK has also evaluated the cash flows for Greenside in a “Tornado” plot in Figure 19-1.

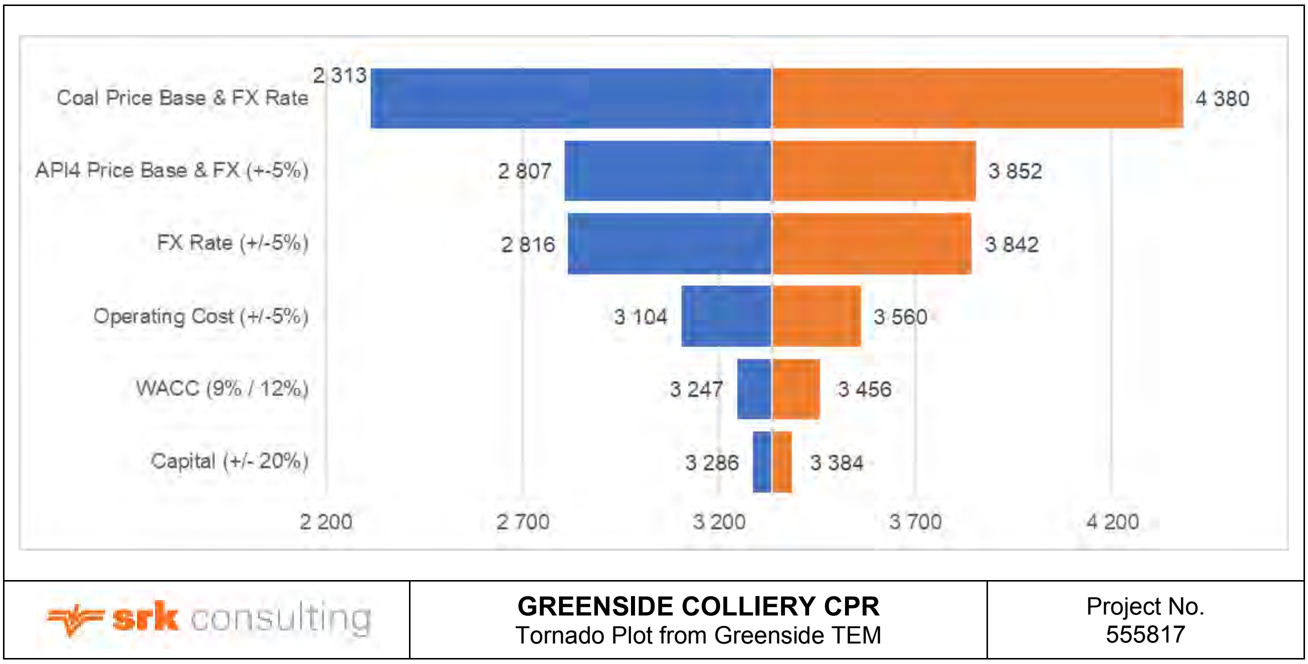


Figure 19-1: Tornado Plot from Greenside TEM

The NPV at the Company’s WACC of the post-tax pre-finance cash flows provides the preferred value for Greenside.

Thus, the value for Greenside per the Income Approach is shown to be ZAR3 335 million (USD226.8 million) in the range of ZAR2 955 million (USD201.0 million) to ZAR3 706 million (USD252.1 million).

The values presented here are derived from cash flows in a TEM which are of a forward-looking nature. These forward-looking statements are estimates and involve several risks and uncertainties that may cause the actual results to differ materially from those anticipated in the CPR.

19.2.4. SRK Comments

The Greenside valuation is extremely sensitive to fluctuations in the market price and foreign exchange rate. The current market volatility due to COVID-19 further exacerbates the potential impact and volatility. Prevailing uncertainty around the rate and extent of any recovery in the global economy and this impact on exchange rates and coal demand arguably reduces the confidence in the price and exchange rate forecasts.

19.3. Valuation - Market Approach

[SV1.18]

The Market Approach attempts to determine the market value of the asset in a third-party, arms-length transaction. The value is not intended to represent the value to a specific purchaser and, as such, does not consider any strategic or sentimental value nor any unique synergies.

19.3.1. Sources of Information

A list of all transactions in South Africa over the past ten years was compiled. This was then filtered by removing the following:

- Any transactions where the primary commodity was not coal;

- Properties where no Reserve or Resource information was available (to infer a value per Resource or Reserve tonne);
- Transactions where no deal value is given; and
- Transactions where the price paid was not available.

Table 19-7 shows the metals and mining company and property deals.

The price paid per tonne reflects the total purchase price per tonne of either Resource inclusive of Reserve (**R&R**) or of Reserve tonnes only (**Rsv**). The percentage paid reflects the total transaction value divided by the value of the tonnes (either R&R or Rsv only) where the value of the tonnes is the price per tonne multiplied by the total tonnage. The advantage of this measure is that it automatically normalises to the price paid whereas the price paid per tonne does not directly consider the prevailing coal price. Neither the price paid per tonne nor the percentage consider the influence of the price outlook, which in some instances will be the primary consideration.

SRK considers that the acquisitions of Leeuw Mining by Bayete Energy and Total Coal by Exxaro represent outliers in the dataset in Table 19-7 and should be excluded in the derivation of the metrics to apply to Greenside. Similarly, the Somkhele transaction relates to an anthracite mine, which has different market dynamics to steam coal and should also be excluded. The resultant set of metrics to be used is shown in Table 19-8.

Table 19-7: Metals and Mining Company and Property Deals

Completion Date	Target	Buyer	Seller	Percent Acquired (%)	Announced Transaction Value (USDm)	R&R Value (ZAR/t)	Price/R&R Value (%)	Rsv Value (ZAR/t)	Price/Rsv Value (%)
Coal Company Deals*									
30/06/2017	Eloff Mining Company (Pty) Ltd	Universal Coal Development IV (Pty) Ltd	Canyon Springs Investments 80 (Pty) Ltd	29.00	3.35	0.315	0.03		
20/06/2017	Keaton Energy Holdings Ltd	Wescoal Holdings Ltd	NA	100.00	67.08	1.83	0.20	7.06	0.76
01/12/2016	Exxaro Resources Ltd	Undisclosed buyers	Dreamvision Investments (Pty) Ltd	4.85	107.53				
01/12/2016	Exxaro Resources Ltd	Undisclosed buyers	Anglo American Plc	9.70	216.74				
08/06/2017	Leeuw Mining & Exploration (Pty) Ltd/Amalahle Exploration (Pty) Ltd	Bayete Energy Resources (Pty) Ltd	Keaton Energy Holdings Ltd	100.00	0.02	0.027	0.003	0.481	0.05
15/02/2016	Leeuw Mining and Exploration (Pty) Ltd	Keaton Energy Holdings Ltd	JPI Leeuw and Associates (Pty) Ltd	8.00	0.90	2.02	0.26	68.75	8.74
20/08/2015	Total Coal South Africa Ltd	Exxaro Resources Ltd	Total S.A.	100.00	467.50	252.41	29.26		
30/09/2015	Leeuw Mining and Exploration (Pty) Ltd	Keaton Energy Holdings Ltd	JPI Leeuw and Associates (Pty) Ltd	18.00	2.44	1.48	0.17	6.53	0.73
Coal Property Deals*									
31/10/2018	North Block Complex	Investor group	Exxaro Resources Ltd	100.00	14.28	8.63	0.90	44.737	4.65
01/08/2018	New Largo project	Investor group	Anglo American Plc	100.00	71.63	1.45	0.16		
27/11/2017	Eloff Project	Universal Coal Development IV (Pty) Ltd	Exxaro Resources Ltd	51.00	6.49	0.33	0.04		
02/11/2017	Mooiplaats Colliery	Mooiplaats Coal Holdings (Pty) Ltd	Investor group	100.00	13.29	2.10	0.23	9.135	0.99
01/03/2018	Eskom-tied coal operations	Seriti Resources (Pty) Ltd	Anglo American Plc	100.00	166.52	3.94	0.43	6.475	0.70
26/06/2017	Uitkomst Colliery	Coal of Africa Ltd	Pan African Resources Plc	91.00	19.62	12.49	1.35	23.10	2.49
14/04/2016	Assets of Optimum Holdings	Tegeta Exploration and Resources (Pty) Ltd	Glencore Plc	67.58	141.24	3.25	0.41	11.24	1.43
27/08/2015	Rietkuil project	Anglo African Capital Ltd	Sable Mining Africa Ltd	63.50	1.28	0.16	0.02		
12/11/2015	Somkhele mine	Business Venture Investments No 1770 (RF) (Pty) Ltd	Petmin Ltd	20.00	28.07	16.56	2.11	53.21	6.77
01/04/2016	Uitkomst colliery	Pan African Resources Plc	Investor group	100.00	15.91	7.78	0.99		
30/07/2015	New Clydesdale Colliery	Universal Coal Development VIII (Pty) Ltd	Exxaro Resources Ltd	100.00	14.94	3.09	0.33	61.70	6.51
31/01/2014	Woestalleen Complex	Blue Falcon 212 Trading (Pty) Ltd	Coal of Africa Ltd	100.00	7.90	1.61	0.17	56.93	5.94
30/07/2013	Kendal property	Joe Singh Group of Companies (Pty) Ltd.	Homeland Energy Group Ltd	100.00	25.15	4.92	0.56	14.24	1.61
31/12/2011	Mpumalanga assets	Imbawula Group	Xstrata plc	100.00	43.00	0.74	0.07	13.67	1.30
					Average	**16.26**	**1.88**	**26.95**	**3.05**
					Median	**2.06**	**0.25**	**13.96**	**1.52**
					Minimum	**0.03**	**0.00**	**0.48**	**0.05**
					Maximum	**252.41**	**29.26**	**68.75**	**8.74**

Note:

R&R – Coal Reserves and Coal Resources inclusive

Rsv – Coal Reserves only

*Sourced from Standard and Poors © S&P Global Market Intelligence

Table 19-8: Metrics from Transaction Data, excluding Outliers and Somkhele

Statistic	R&R Value (ZAR/t)	Price/R&R Value (%)	Rsv Value (ZAR/t)	Price/Rsv Value (%)
Median	2.02	0.23	13.96	1.52
Minimum	0.16	0.02	6.48	0.70
Maximum	12.49	1.35	68.75	8.74

From Table 19-7, SRK determined that there were nine transactions that were directly comparable to Greenside. These are highlighted in Table 19-7. The statistics from these nine transactions have been extracted to provide the filtered set shown in Table 19-9.

Table 19-9: Filtered Set of Metrics from Transaction Data applicable to Greenside

Statistic	R&R Value (ZAR/t)	Price/R&R Value (%)	Rsv Value (ZAR/t)	Price/Rsv Value (%)
Median	3.09	0.33	18.39	1.96
Minimum	0.74	0.07	6.53	0.73
Maximum	12.49	1.35	68.75	8.74

The maximum is unaffected as the relevant transaction is not amongst those that are filtered out. However, the minimum is changed and, since all transactions impact these values, the median and mean are also affected.

19.3.2. Market Valuation Metrics

A summary of the above metrics applied to the Coal Resources and Coal Reserves is presented in Table 19-10. The subset of export collieries is shown in the three columns on the right and the implied valuation from each of the metrics is shown in the final six rows (median, minimum and maximum for the ZAR/t and percentage of in situ value). Note that the median is not referred to as preferred and minimum and maximum are not referred to as low and high. These are merely the products of the ZAR/t or percentage in situ and the corresponding tonnages. The selected range is then from these values. The subset was filtered based on discussions with the CP.

Using the spot values for a price of USD87.25/t for a 6 000 kcal/kg coal and an exchange rate of ZAR14.703 = USD1.00 at the Valuation Date, the equivalent price for coal of different CV[1]s is determined.

Table 19-10: Value Ranges from Market Assessment

Item/Description	Units	Exclude Outliers and Somkhele			Export Colliery Transaction Subset		
		Sale Rsv	RoM Rsv	R&R	Sale Rsv	RoM Rsv	R&R
Saleable Reserve	(Mt)	19.3			19.3		
Saleable CV	(kcal/kg)	6 272			6272		
Saleable Price	(ZAR/t)	1341			1341		
RoM Reserve	(Mt)		27.8			27.8	
RoM CV	(kcal/kg)		5 331			5331	
RoM Price	(ZAR/t)		1140			1140	
MTIS Res	(Mt)			57.15			57.15
MTIS CV	(kcal/kg)			5556			5556
MTIS Price	(ZAR/t)			1188			1188
In situ Value	(ZARm)	25 881	31 686	67 890	25 881	31 686	67 8909
Median (ZAR/t)	(ZAR/t)	13.96	13.96	2.06	18.39	18.39	3.09
Median (%)	(%)	1.52	1.52	0.25	1.96	1.96	0.33
Min (ZAR/t)	(ZAR/t)	0.48	0.48	0.03	6.53	6.53	0.74
Min (%)	(%)	0.05	0.05	0.00	0.73	0.73	0.07
Max (ZAR/t)	(ZAR/t)	68.75	68.75	252.41	68.75	68.75	12.49
Max (%)	(%)	8.74	8.74	29.26	8.74	8.74	1.35
Median based on ZAR/t	(ZARm)	269	388	118	355	511	177
Median based on % *in situ*	(ZARm)	393	482	166	507	621	224
Minimum based on ZAR/t	(ZARm)	9	13	2	126	182	42
Minimum based on % *in situ*	(ZARm)	13	16	2	189	231	48
Maximum based on ZAR/t	(ZARm)	1327	1911	14426	1327	1911	714
Maximum based on % *in situ*	(ZARm)	2262	2769	19865	2262	2769	917

Note:

1. Rsv is the exclusive Reserve and R&R are Resources inclusive of Reserves. Sale Rsv is the saleable portion of the Reserve and a subset of the RoM (Run of Mine) Reserve.

19.3.3. Derivation of Market Values

The previous transactions reflect a wide range of values paid. It is apparent from Table 19-10 that the Market Approach gives values between ZAR2 million and ZAR16 billion. However, preference is given to the metrics linked to the Reserves (rather than Resources inclusive of Reserves) and with the filtered transactions in the three columns on the right more representative of the value of an export mine. This reduces the range to ZAR126 million to ZAR2.8 billion.

The median prices paid (based on a ZAR/t and the percentage of *in situ* value) for the saleable and RoM Reserves are in the region of ZAR350 - 650 million (ZAR 355, 507, 511 and 621 million). An upper limit for similar metrics is then in the range of ZAR1.3-2.8 billion (ZAR 1327, 2262, 1911 and 2769 million). The range selected from these transactions is from ZAR550 million (approximately in the centre of the median percentage in situ paid for Saleable Reserves – ZAR 507 and 621 million) to ZAR2.75 billion (paid for RoM Reserves on a percentage *in situ* basis).

The selected range for Greenside from the Market Approach is ZAR550 million to ZAR2 750 million. SRK has not identified a preferred value from the Market Approach as the overall preferred value is from the Income Approach. SRK considers the Income Approach to be a more appropriate indicator of value with the Market Approach providing corroboration.

Applying the metrics in Table 19-9 to the declared Coal Reserves of 27.75 Mt (including 1.9Mt of Inferred and for a total of 19.4 Mt Saleable of which 1.3 accrues from the Inferred tonnes), the minimum and maximum values for Greenside according to the Market Approach are derived (Table 19-11). Note that the Inferred RoM and Saleable is included in the calculation as these tonnes are in the LoM plan and because mining has taken place in adjacent blocks.

Table 19-11: Market Valuation for Greenside

Units	Minimum	Maximum
Value (ZARm)	550	2 750
Value (USDm)	37	187

19.4. Derivation of Value

The preferred, minimum and maximum values per the Income and Market valuation approaches are compared in Table 19-12, and shown diagrammatically in Figure 19-2.

Table 19-12: Comparison of Income and Market Valuations for Greenside

Valuation Approach	Units	Minimum	SRK-preferred	Maximum
Income	(ZARm)	2 955	3 335	3 706
Market	(ZARm)	550		2 750
SRK-selected	(ZARm)	2 750	3 335	3 750
Income	(USDm)	201.0	226.8	252.1
Market	(USDm)	37.4	-	187.0
SRK-selected	(USDm)	187.0	226.8	255.0

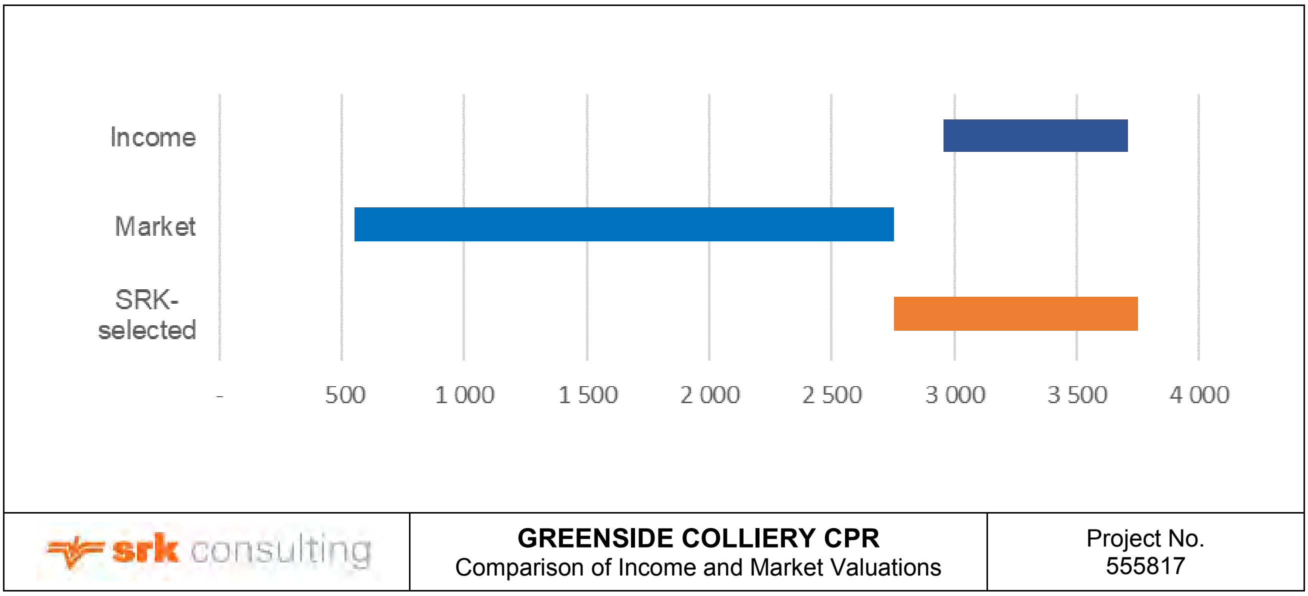


Figure 19-2: Comparison of Income and Market Valuations in ZARm

SRK considers the values derived from the Income approach to be more appropriate given that they are based on cash flows derived from a LoM production schedule and costs that are well understood.

The SRK-selected values in Table 19-12 still need to be adjusted for balance sheet items (e.g. inventories, debt and cash on hand) at 31 December 2020. Accounts receivable and accounts payable at 31 December 2020 were taken into account in modelling the working capital movements in the TEM.

19.5. Previous Valuations

[SV1.11]

SRK is not aware of any valuations for Greenside that have been published in the public domain during the previous two years.

19.6. Summary Valuation for Greenside Colliery

[12.10(h)(xii)] [SR5.8(i)] [SV1.12, SV1.14, SV1.15]

The summary valuation for Greenside at the Valuation Date is set out in Table 19-13.

The values for Greenside were derived on a 100% basis and reflect SRK's preferred value derived for the Coal Reserves derived from the Income and Market valuation approaches. The effect of debt/loans and debt servicing was excluded in the compilation of the TEM used in the Income Approach valuation method, with the necessary adjustments reflected in Table 19-13.

Adjustments have been made in Table 19-13 for balance sheet items, which include cash on hand, medium- and long-term borrowings (debt) and finished product inventories. The Company confirmed to SRK that there are no hedge or derivative contracts in force.

The medium- and long-term borrowings for Greenside is a pseudo position, since Greenside is not a legal entity, does not have its own bank account and as such does not have a standalone external net debt position. The "borrowings" are intra-company amounts held at the AOPL level. However, at the Listed Company level these various intra-company "borrowings" are eliminated and only the external net debt/cash position is reflected. It is the intention that upon demerger, the Listed Company will not have external net debt within its capital structure. The invested equity adjustments required to redeem the "borrowings" are undertaken at a subsidiary level within the Group. Consequently, this change does not have an impact on the equity value at the Listed company level, as the mines held in AOPL are 100% owned and accordingly AOPL is 100% held by SACO which in turn is 100% held by the Listed entity. As such the flow-through interest held by AOPL, SACO and the Listed entity in Greenside does not change when the demerger occurs.

Entries in Table 19-13 were derived in ZAR terms and converted to USD terms at the spot exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

Table 19-13: Greenside Colliery Summary Valuation (at 31 December 2020)

Contract	Selected Value		The Company's Interest (%)	Fair Value to the Company	
	ZARm	USDm		ZARm	USDm
Greenside Colliery	3 335	226.8	100%	3 335	226.8
Sub-total	3 335	226.8		3 335	226.8
Adjustments					
Cash on hand				0	0
Medium and long-term borrowings[1]				0	0
Finished product inventories[2]				191	13.0
Exploration budget costs				Included in cash flows	
Hedge contracts – mark to market				None in force	
Environmental liabilities				Included in cash flows	
Net Greenside Value				**3 526**	**239.8**

Notes:
1 Medium- and long-term borrowings are intra-company amounts that will have no cash impact on Greenside.
2 Finished product inventories are valued by the Company at the lower of cost of net realisable value. The holding value of consumables and spares inventories has been excluded.

SRK repeated the construction of Table 19-13 using the selected minimum and maximum values derived from the Income and Market valuation approaches.

SRK considers that the fair value for Greenside after adjustment for balance sheet items is ZAR3 526 million (USD239.8 million), in the range of ZAR2 941 million (USD200.1 million) to ZAR3 941 million (USD268.1 million).

19.7. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

The risks are discussed in detail in the risk review section. The risks from price and exchange rate variation are both risks and opportunities. This has been simplistically dealt with in the risk review section by allowing that both outcomes are possible and reducing the likelihood of the risk materialising. The price has been volatile recently in USD, as shown by the price history, and this is currently exacerbated by the volatility of the ZAR. The current weakness is favourable, but a range of possible paths could see both up- and downside. The potential financial impact of the risks has been considered in the risk section and sensitivities are included in this section and give an indication of a potential range of outcomes.

19.8. Conclusions

[SV1.15]

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

SRK considers the values derived from the Income Approach to be more appropriate given that they are based on cash flows derived from a LoM production schedule and costs that are well understood; however, the value is sensitive to fluctuations in the coal price and foreign exchange rates. The values derived from the Market Approach are not dissimilar to those from the Income Approach.

SRK considers that the fair value for Greenside after adjustment for balance sheet items is ZAR3 526 million (USD239.8 million), in the range of ZAR2 941 million (USD200.1 million) to ZAR3 941 million (USD268.1 million).

20. Risk Assessment

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

20.1. Introduction

An iterative, integrated and collaborative risk assessment was carried out as part of the study to identify existing and potential vulnerabilities that could affect the project, using inputs from each of the project disciplines.

The risk assessment was highly participative, with inputs from various technical team members, identified in Table 1-1. The various technical team members populated the risk register electronically, prior to the risk workshop. The risk workshop served to confirm and evaluate the various items from the risk register.

20.2. Approach

The risk framework used in the Company's 2019 CPR was used in order to maintain consistency in approach, terminology and rating values[8]. The approach is summarised as follows:

- Description
  - The risk, the cause of the risk and the consequence/s that are associated if the risk is realised, were described;
  - The probability of occurrence was rated, using the standard terminology shown in Table 20-1; and The consequence was rated, using the standard terminology shown in Table 20-2.
- Inherent Rating
  - Based on the likelihood of occurrence and consequence if realised, the inherent rating of each risk was determined using the standardised risk matrix shown in Table 20-3.
- Mitigation and Residual Rating
  - Mitigatory measures were identified for the risks and described; and
  - Based on the interpretation that the actions for mitigation will be incorporated into the risk management of the project, and the perceived efficacy of the implementation (as shown Table 20-4), the residual risk ratings were determined using the risk matrix in Table 20-3.

The risk assessment concluded with the theme of Risk Resilience [8] – which is understanding the Residual following the implementation of mitigation. Using this concept, the residual risks can be classified into four types:

- Resilient – where the reduction in risk is nil or very small, and the residual risk is essentially the same as the initial risk;
- Robust - where the reduction in risk is limited, and although the risk has been mitigated to some degree, the residual risks remain of concern and further mitigation is necessary;
- Temperate - where the reduction in risk is moderate, and although the risk has been mitigated to a larger degree, some further mitigation may be necessary; and
- Weak - where the reduction in risk is considerable, and the risk has been effectively mitigated and further mitigation is probably not necessary.

[8] The risk framework used in the AOPL CPR was used in order to maintain consistency in approach, terminology and rating values, namely: Anglo American Coal (AAC). (2019b). Competent Persons Report (CPR) Reserves and Resources for the period ending 31st December 2019. Greenside Colliery. page 145-147.

Table 20-1: Descriptors for Probability of Occurrence

Description	Probability	Informal Guidance
Rare	<3% likelihood of occurring	Occurs only in **exceptional** circumstances
Unlikely	3% to 10% likelihood of occurring	May occur in uncommon circumstances
Possible	>10% to 30% likelihood of occurring	Might occur at some time
Likely	>30% to 90% likelihood of occurring	Will probably occur in most cases
Almost certain	>90% likelihood of occurring	Is expected to occur in most circumstances

Table 20-2: Descriptors for Consequence

Description	Financial/ Economic	Operational/ Business Interruption	Health and Safety	Skills	Natural Environment	Social	Corporate Image/Reputation	Legal
Insignificant	<5% change in value	2.5% of project schedule overrun	Medical treatment case, dressing station, no impairment	<5% unavailability of critical skills	Natural processes are affected but with impacts being reversible immediately	Issue of no political and community concern	Issue of no public concern	Low-level legal issue
Minor	5% to 10% change in value	5% of project schedule overrun	Reversible impairment or Lost Time Injury	Up to 10% unavailability of critical skills	Natural processes are affected, but continued in a modified way with impacts being reversible within lifetime of operation	Local concern consisting of repeated complaints	Local press interest and Local political concerns	Non-compliance and breach of regulations
Moderate	10% to 25% change in value	10% of project schedule overrun	Lost Time Injury - Reportable	Up to 25% unavailability of critical skills	Natural processes are notably altered but continued in a modified way with impacts being reversible within lifetime of operation.	Declared Provincial Concerns and serious inflow of community complaints.	Limited damage to reputation, extended local press interest/ Provincial press interest.	Breach of regulations; investigation or report to authority with prosecution and/or moderate fine possible.
High	25% to 80% change in value	20% of project schedule overrun	Single fatality, multiple injuries or permanent disability	Up to 80% unavailability of critical skills	Natural processes are disrupted for the duration of the activity but resume functioning after the operation has been terminated.	Loss of credibility and confidence. Criticism by National Government	National press coverage. Independent External Enquiry.	Breach of regulation, severe litigation
Major	>80% change in value	>30% of project schedule overrun	Multiple fatalities or health impact of similar nature affecting multiple persons	>80% unavailability of critical skills	Natural processes are permanently disrupted to the extent that these processes could permanently cease.	Widespread social riots & work blockages, Declared National Political Concerns and Investigations.	Declared National political concerns, International and Local Media Coverage.	Prosecution and fines, litigation including class actions

Table 20-3: Risk Matrix[9]

		Consequence				
		Insignificant	Minor	Moderate	High	Major
Probability	Almost Certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	Extreme	Extreme
	Possible	Low	Medium	High	High	Extreme
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Medium	Medium	High

Table 20-4: Descriptors for Effectiveness of Mitigation

Description	Effectiveness	Outcome Following Mitigation
No mitigation	No mitigation is carried out therefore the risk remains the same	The residual risk remains the same as the inherent risk; mitigation must be considered for intolerable risks
Damaging	The mitigation applied increases the risk instead of reducing the risk	The residual risk remains of concern; further and/or alternative mitigation is necessary to address the increased risk and/or intolerable risks
Deficient	The mitigation applied has very little effect on reducing the risk	The residual risk is essentially the same as the inherent risk; further mitigation is necessary
Marginal	The mitigation applied has reduced the risk to some degree	The residual risk remains of concern and further mitigation is necessary
Qualified	The mitigation applied has reduced the risk to a larger degree	Although the residual risk has largely been mitigated, further mitigation may be necessary
Effective	The mitigation applied has reduced the risk considerably	Further mitigation is probably not necessary
Excessive	The mitigation that has been applied is more than necessary to reduce the risk. There may be over-control	

20.3. Overview of Results

The full risk register and assessment are shown in Table A-1 in Appendix 1.

A total of 63 risks were evaluated across the disciplines, of those:

- 41 have a **low** residual rating;
- 16 have a **medium** residual rating;
- 6 have a **high** residual risk rating and
- 0 have an **extreme** residual risk rating.

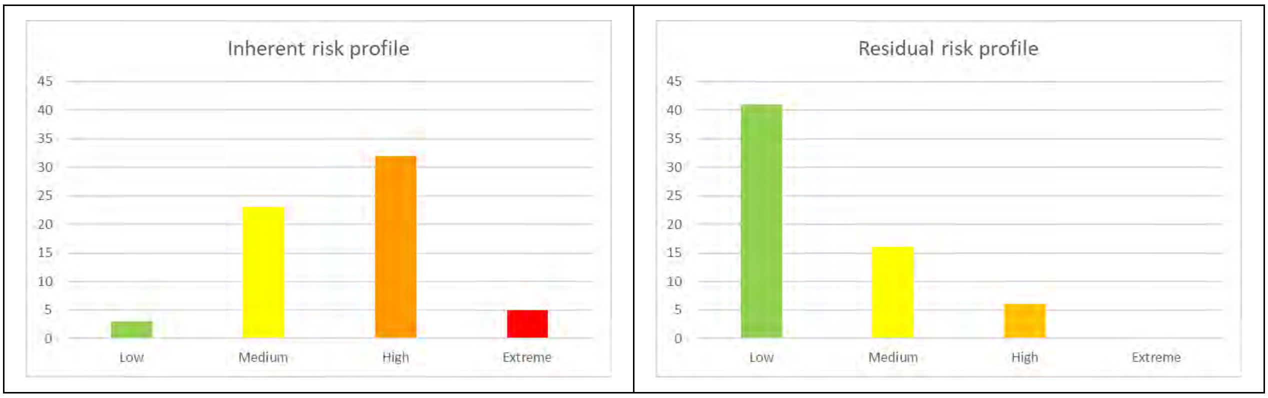
Subsequently, the risk resilience is as follows:

- 12 residual risks are considered to be **resilient;**
- 32 residual risks are considered to be **robust;**

[9] The risk framework used in the AOPL Greenside CPR was used, in order to maintain consistency in approach, terminology and rating values, namely: Anglo American (2019b). Competent Person's Report (CPR) Greenside Colliery Reserves and Resources for the period ending 31st December 2019. Greenside Colliery. page 145-147.

- 17 residual risks are considered to be **temperate;** and
- 2 residual risks are considered to be **weak.**

Figure 20-1 shows the comparison of risk profiles, whereas the heat map plots in Figure 20-2 (inherent risk rating) and Figure 20-3 (residual risk rating) contrast the elements of the risk profile – and highlight the importance of effective mitigation and control measures. Table 20-5 shows the comparison of risk ranking.



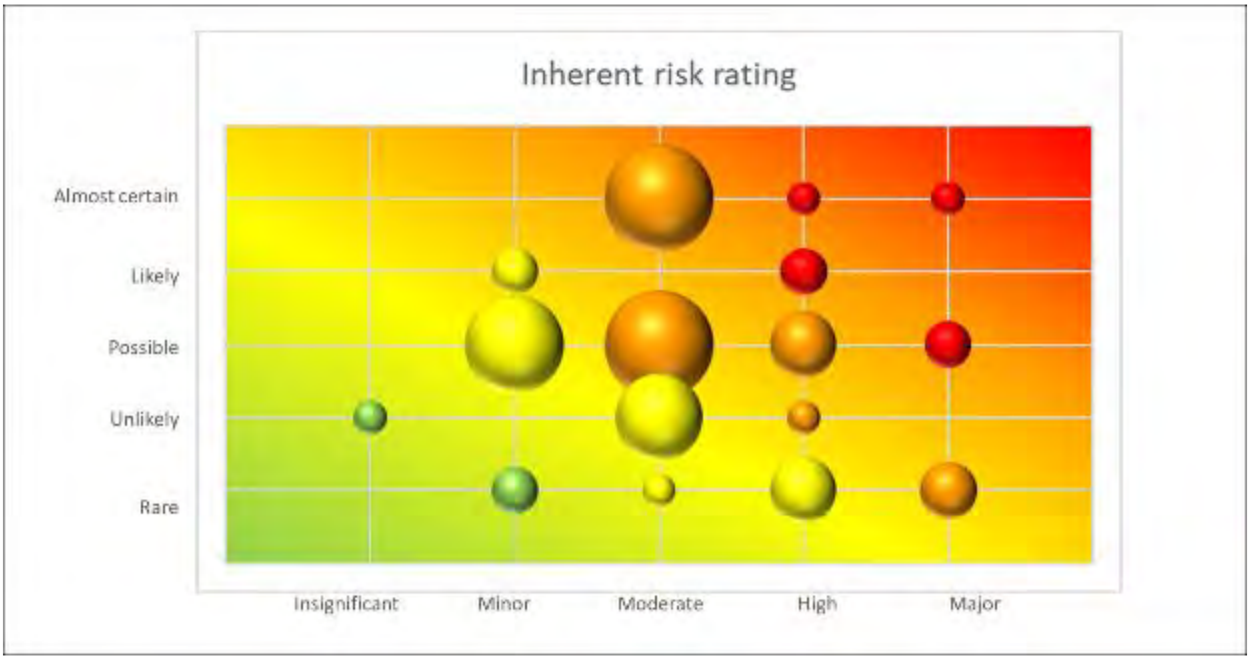
srk consulting | **GREENSIDE COLLIERY CPR** Comparison of Risk Profiles Pre- and Post-Mitigation | Project No. 566644

Figure 20-1: Comparison of Risk Profiles Pre- and Post-Mitigation

Table 20-5: Comparison of Risk Rank Elements using the Company's Framework[10]

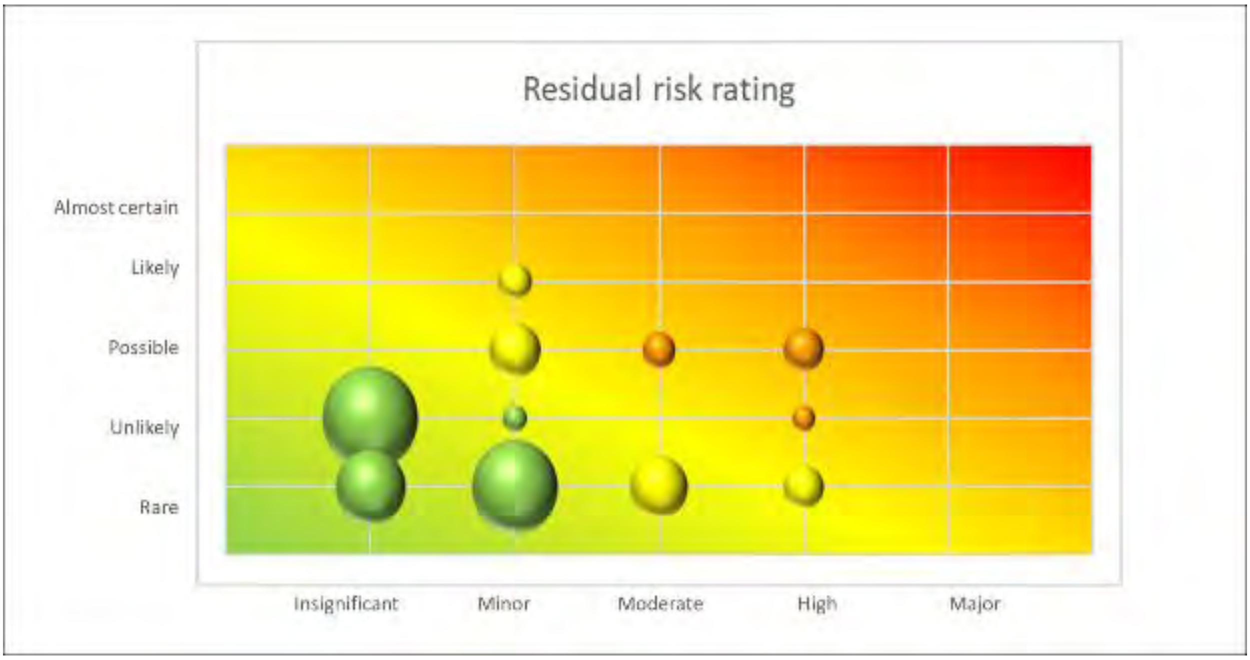
			Consequence				
			Insignificant	**Minor**	**Moderate**	**High**	**Major**
			1	**2**	**3**	**4**	**5**
Probability	**Almost Certain**	**5**	Medium 0 / 0	High 0 / 0	High 1 / 0	Extreme 1 / 0	Extreme 1 / 0
	Likely	**4**	Medium 0 / 0	Medium 2 / 2	High 10 / 0	Extreme 2 / 0	Extreme 0 / 0
	Possible	**3**	Low 0 / 0	Medium 9 / 5	High 11 / 2	High 4 / 3	Extreme 2 / 0
	Unlikely	**2**	Low 1 / 16	Low 0 / 1	Medium 7 / 0	High 1 / 1	High 0 / 0
	Rare	**1**	Low 0 / 9	Low 3 / 14	Medium 1 / 6	Medium 4 / 3	High 3 / 0

[10] The risk framework used in the AOPL Greenside CPR was used in order to maintain consistency in approach, terminology and rating values, namely: Anglo American (2019b). Competent Person's Report (CPR) Greenside Colliery Reserves and Resources for the period ending 31st December 2019. Greenside Colliery. page 145-147.



srk consulting	**GREENSIDE COLLIERY CPR** Distribution of Risk Rank Elements (Pre-Mitigation)	Project No. 566644

Figure 20-2: Distribution of Risk Rank Elements (Pre-Mitigation) [11]



srk consulting	**GREENSIDE COLLIERY CPR** Distribution of Risk Rank Elements (Post-Mitigation)	Project No. 566644

Figure 20-3: Distribution of Risk Rank Elements (Post-Mitigation) [11]

[11] In reading the color-coded heatmaps of Figure 20-2 and Figure 20-3- red shows the higher risk rating and green shows the lower risk rating. Furthermore, the size of the bubble corresponds with the number of risks i.e. smaller bubbles indicate a *fewer* number of risks and large bubbles indicate a *greater* number of risks at the particular probability and consequence combination.

The detailed results from each of the disciplines of the risk assessment are presented in Table B-1 in Appendix 2.

20.4. Risks per Discipline

Table 20-6 consolidates the key risks identified for Greenside, arranged per discipline.

Table 20-6: Key Risks

Discipline	Risk Description	Probability	Consequence	Inherent Risk Rating	Residual Risk Rating
Closure	Under provision for closure	Possible	Moderate	High	High
Coal Processing	Magnetite supply becomes unavailable	Possible	Major	Extreme	High
Electrical Infrastructure	Unreliable bulk power supply (load curtailment due to load shedding)	Likely	High	Extreme	High
Rock Engineering	Subsidence from historical mining	Almost certain	Major	Extreme	High
Social	Delays in social transitioning post closure	Likely	High	Extreme	High
TEM	Lower revenue (linked to price)	Possible	High	High	High
TEM	Lower revenue (linked to exchange rate)	Possible	High	High	High

20.5. Opportunities per Discipline

Table 20-7 consolidates the key opportunities identified for Greenside, arranged per discipline.

Table 20-7: Opportunities

Discipline	Risk Description	Opportunity Description
Electrical Infrastructure	High power costs	There may be an opportunity to implement energy efficiency programmes to try and offset the high power costs. In considering this opportunity, factors such as capital requirements and payback periods will need to be considered to determine if the projects will provide sufficient benefits.
EWRP	Overflow of storage tanks / facilities	A suitable and/or optimised mitigation strategy may be drawn up, following a formal analysis of the systemic issues to ensure that storage tanks/facilities do not overflow.
EWRP	Short-term, unplanned EWRP stoppages	A response could be drawn up to include identifying buffer storage areas/facilities at each mine, where excess water could be stored temporarily in order to avoid complete disruption to the operation.
Material contracts	Though not as a direct result of a risk - an opportunity exists in respect of the provision of supplies and services to the mine	There is an opportunity to use contracts for successful and beneficial localised procurement.

21. Conclusions and Recommendations

[SR5.7(i)] [SR7.1(ii)] [SV1.2] [ESG4.9]

21.1. Regulatory Environment and Tenure

Greenside has sufficient Mining Rights in place to cover the current area of mining, the GAR. These Mining Rights are either in the name of Greenside itself or held by the Company's Khwezela Colliery (the Landau and Kleinkopje Mining Rights). The Company has an internal agreement whereby Greenside mines these adjoining Mining Rights.

Two land claims have been registered on portions of the farm Weltevreden 324 JS and are currently in progress.

Greenside is well run from an environmental perspective. The mine has an approved EMPr, several EAs and a WUL. The colliery is registered as a waste producer; however, they do not have a waste management licence in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008). All general waste generated on site is transported and disposed of at the Secunda landfill site. All hazardous waste is removed by a contractor and is disposed of at the Holfontein landfill site.

Pre-directives or directives have not been issued to the mine by any of the environmental authorities to date. The mine has an appointed Environmental Coordinator and it is currently implementing and EMS to ensure that it can meet its permit obligations and manage environmental aspects relevant to its operations. It is imperative that the mine demonstrates good environmental performance especially regarding compliance with its permit conditions and management of exceedances measured and recorded in the various monitoring programmes to avoid DMRE censure, directives and/or fines for non-compliance with permit commitments.

The SLP for the 2019 to 2023 period was submitted to the DMRE in February 2019; however, DMRE approval was not obtained at the time. An updated SLP for the 2019 to 2023 period was therefore submitted to the DMRE on 30 September 2020.

The site has a training centre that is ISO 9001:2008 certified and has training provider status from the MQA. Greenside complies and will continue to comply with the requirements of the Skills Development Act.

21.1.1. Sufficiency of the Rights

Greenside has an arrangement with neighbouring Khwezela Colliery to mine some of the coal covered by the Kleinkopje and Landau Mining Rights. This is a practical arrangement to ensure the most appropriate mining of the coal. Together with the Greenside Mining Right and the pending Vlaklaagte Mining Right application and executed Prospecting Right, the area to be mined is sufficiently covered by granted and executed Mining Rights.

The Company owns the surface rights in areas where there is colliery surface infrastructure, although some of this land is leased to tenants.

The colliery has submitted a consolidated WUL application to include all previously issued licences; approval is awaited.

21.2. Geology, Exploration, Drilling, Sampling Techniques and Data

Coal is found in South Africa in 19 coalfields in the Karoo Supergroup, mainly in the Vryheid Formation of the Ecca Group. Greenside is located near the northern extent of the Witbank Coalfield, within the Mpumalanga Province of South Africa.

The stratigraphy of the Witbank Coalfield is described from the base upwards:

- The Dwyka Group sequence - massive diamictites with lesser matrix-supported conglomerates and coarse-grained sandstones;
- The Vryheid Formation - sandstones, mudstones and siltstones, with lesser amounts of coal. Five coal seams are present - the No 1, 2, 3, 4 and 5 Seams, named from the base up. The No 1 and No 3 Seams are thin and discontinuous throughout the coalfield. The No 2 Seam (1.5 - 4.0 m thick) consists of mainly dull coal; it has been extensively mined and little unexploited coal remains. The No 4 Seam averages four metres thick and is now the most important seam economically; the coal is of lower quality than the No 2 Seam and shale intercalations are common in the upper part of the seam. The No 5 Seam, a bright to dull coal, is present

over most of the coalfield, attaining mineable thicknesses in the northern and western portions of the field only. It too has been extensively mined and little mineable coal remains.

Surface material at Greenside consists of weathering products of the sandstones, siltstones and mudstones of the Vryheid Formation, with isolated patches of dolerite in the southwestern part of the GAR. The top layer consists of reddish-brown sandy soil, with clayey-sandy subsoil below. Weathering generally does not extend deeper than approximately 12 m at Greenside, except where adjacent to dolerite dykes and close to surface water bodies. Weathering negatively affects the mineable coal reserve, but rarely has an impact of the physical mining operation in terms of mining method and design.

The five main coal seams of the Witbank Coalfield all occur extensively within Greenside. The distribution of the lower seams (No 1 and No 2 Seams) is controlled by the underlying palaeotopography while that of the uppermost No 5 Seam is controlled by the level of the resent day erosion. The seams are generally flat lying and gently undulating. Numerous southwest-northeast trending dolerite dykes were encountered during mining of the No 2 Seam; these are also encountered during extraction of the No 4 Seam. The most prominent structural feature is the northwest-southeast trending fault, which divides the colliery into two distinct portions. The throw on this fault has been measured at approximately 30 m in the southeast, but gradually decreases northeastwards. Numerous smaller faults splay off with end of this main fault. A second large fault is encountered in the western portion of the mine, trending north-northwest, with associated dolerite emplacement. Mining has been impacted by both dykes and faults, to varying degrees; in places mining has had to stop well before either of these features while in others it was possible to mine through them.

Historical exploration data has been incorporated into the current geological database and model, which contains drill hole data, channel sample data and analytical results. Planned exploration for 2020 focuses on drilling and sampling 41 cored drill holes with a total length of 2 000 m and is expected to have a total cost of ZAR5 911 907.

The complete core is sampled and sent to the Bureau Veritas laboratory in Middelburg for analysis. The coal samples are crushed and screened to produce a -25 mm +0.5 mm sample fraction and a -0.5 mm fines fraction for analysis. The mass percentages of the two size fractions are determined and reported. The samples are air-dried (under controlled, prescribed atmospheric conditions) and conditioned before being analysed.

The Greenside-specific analytical regime applied to each sample is determined by a set of “Mask Codes”, developed in conjunction with the laboratory. The Mask Codes are based on the seam and coal type/parting material. Some samples are analysed raw, while others undergo full float and sink analysis; this applies to coal horizons that could potentially supply both the high and low-quality export markets. This allows the Company to perform all required export and domestic product simulations. Each float and sink fraction is analysed for proximate analysis (inherent moisture content, ash content and volatile matter content), calorific value and total sulphur content; fixed carbon content is determined by difference. Full washability tables with fractional and cumulative values for each density fraction are provided for each sample (where applicable). Samples that are analysed raw are described by a single line of data containing the proximate analysis, calorific value and total sulphur.

21.3. Coal Resource Estimates

[SR1.4(iii), SR4.2(v), SR4.5(vi), SR6.1(iii)]

All Coal Resources are reported inclusive of the Coal Reserves.

The Coal Resource estimates were conducted in accordance with the SAMREC Code, 2016 Edition, as well as SANS10320:2020.

The Coal Resource estimates have been independently estimated by Ms K. Black of KJB GeoServices and signed off by Ms L. Jeffrey on behalf of SRK, based on the model supplied by the Company and verified by SRK. The Coal Resource estimate is declared as at 31 December 2020.

The Greenside Coal Resource on an MTIS air-dried basis amounts to 65.37 Mt. This estimate is made up of Measured, Indicated and Inferred *in situ* Coal Resources, both inside and outside of the Mine Plan (57.17 Mt), and the tonnage ascribed to the MRD (8.2 Mt).

The *in situ* Greenside Coal Resource on a MTIS adb amounts to 57.17 Mt. The estimate is made up of 51.08 Mt of *in situ* Measured Coal Resources (89%), 1.59 Mt of *in situ* Indicated Coal Resources (3%), 4.5 Mt of *in situ* Inferred Coal Resources (8%). The 8.2 Mt of Measured Coal Resources derived from the MRD comprises 12.5% of the total Greenside Coal Resource estimate of 65.37 Mt. The average inherent moisture (**IM**) of the *in situ* coal is 2.2%. The estimate for the MRD is that as determined by the Company; SRK has reviewed the methodology employed by the Company to estimate the potential MRD resources and is of the opinion that is has been done conservatively and correctly; the MRD estimate is included in SRK's Coal Resource Statement. The remaining volume of material in the MRD is significantly larger than indicated in the Coal Resource Statement but requires further evaluation before it can be classified as a Coal Resource.

The Coal Resources for Greenside on a total basis[12] (100% attributable to Greenside) at 31 December 2020 are summarised in Table 21-1 (*in situ* coal) and Table 21-3 (MRD material); the raw coal qualities pertained to the Coal Resources are shown in Table 21-2.

The Coal Resources have been subdivided into those inside and outside the Life of Mine Plan, which has been determined using the specified mine design parameters within the economic footprint (SANS 10320:2020, clauses 3.2.5, 8.1.1.1, 8.1.2.3 and Table F1).

Coal Resources inside the Mine Plan are reported inclusive of the Coal Reserves.

[12] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to the Greenside Area of Responsibility and is equivalent to the term "gross" used in the AIM Mining Guidance.

Table 21-1: Greenside No 4 Seam MTIS Coal Resource Statement as at 31 December 2020 (adb)

Block	Resource Classification Category	Mining Method	Seam	Theoretical Mining Height (m)	Area (ha)	Seam Thick-ness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
INSIDE THE MINE PLAN									
West Block	Measured	UG+BP	No 4	2.0 – 4.8	43.89	3.92	1.51	7.0	2.38
Central Block	Measured	UG+BP	No 4	2.0 – 4.8	107.09	4.43	1.55	7.0	6.85
	Indicated	UG+BP	No 4	2.0 – 4.8	2.10	2.40	1.52	12.5	0.07
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**109.19**	**4.40**	**1.55**	**7.1**	**6.92**
East Block	Measured	UG+BP	No 4	2.0 – 4.8	716.99	3.10	1.57	7.0	32.45
	Inferred	UG+BP	No 4	2.0 – 4.8	58.40	3.15	1.6	15.0	2.5
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**775.38**	**3.10**	**1.57**	**7.6**	**34.95**
Total Inside the Mine Plan		**UG+BP**	**No 4**	**2.0 – 4.8**	**928.47**	**3.35**	**1.57**	**7.5**	**44.25**
OUTSIDE THE MINE PLAN									
West Block	Measured	UG+BP	No 4	2.0 – 4.8	145.13	3.90	1.54	7.0	7.89
Central Block	Measured	UG+BP	No 4	2.0 – 4.8	19.84	4.78	1.56	7.0	1.37
East Block	Measured	UG+BP	No 4	2.0 – 4.8	2.37	3.80	1.63	7.0	0.14
	Indicated	UG+BP	No 4	2.0 – 4.8	30.87	3.59	1.57	12.5	1.52
	Inferred	UG+BP	No 4	2.0 – 4.8	45.52	3.34	1.6	15.0	2.0
	Subtotal	**UG+BP**	**No 4**	**2.0 – 4.8**	**78.76**	**3.50**	**1.59**	**13.7**	**3.66**
Total Outside the Mine Plan		**UG+BP**	**No 4**	**2.0 – 4.8**	**243.73**	**3.87**	**1.56**	**8.9**	**12.92**
GRAND TOTAL (Inside + Outside the Mine Plan + MRD)			**-**	**-**	**1172.20**	**3.47**	**1.56**	**7.8**	**57.17**

Notes:

1. Total is 100% of the Coal Resources attributable to the mining licence and is equivalent to the term gross used in the AIM Mining Guidance.
2. Coal Resources quoted in decreasing order of geological confidence.
3. Fresh coal only, and coal within Mining Right boundary.
4. UG+BP = Underground Bord and Pillar.
5. OC = Opencast.
6. Minimum seam thickness/theoretical mining height cut-off of 2.0 m.
7. Maximum theoretical mining height cut-off of 4.5 m.
8. Ash < 50% cut-off applied.
9. VM > 17% cut-off applied.
10. ARD – Apparent Relative Density.
11. The bulk density for the MRD is not stated in the Company's estimate.
12. All seam thicknesses used are true thicknesses.

Table 21-2: Greenside No 4 Seam Average Raw Coal Qualities (adb)

Block	Resource Classification Category	Seam	ASH (%)	CV¹ (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)
INSIDE THE MINE PLAN								
West Block	Measured	No 4	21.2	24.63	53.6	2.4	1.44	22.9
Central Block	Measured	No 4	24.8	23.05	50.0	2.6	1.30	22.8
	Indicated	No 4	22.0	24.58	52.3	2.4	1.46	23.3
	Subtotal		**24.7**	**23.06**	**50.0**	**2.6**	**1.30**	**22.8**
East Block	Measured	No 4	26.4	23.09	48.1	2.3	1.59	23.2
	Inferred	No 4	26.3	23.2	48.8	2.4	1.8	22.5
	Subtotal	No 4	**26.4**	**23.10**	**48.1**	**2.3**	**1.60**	**23.2**
Average Inside the Mine Plan		**No 4**	**25.8**	**23.18**	**48.7**	**2.4**	**1.55**	**23.1**
OUTSIDE THE MINE PLAN								
West Block	Measured	No 4	23.8	23.82	50.8	2.3	1.73	23.0
Central Block	Measured	No 4	24.8	23.12	50.4	2.8	1.25	22.0
East Block	Measured	No 4	31.1	21.13	41.5	2.2	1.92	25.2
	Indicated	No 4	26.0	23.07	47.2	2.4	1.82	24.4
	Inferred	No 4	26.0	23.3	48.5	2.4	1.7	23.1
	Subtotal	No 4	**26.2**	**23.14**	**47.7**	**2.4**	**1.74**	**23.7**
Average Outside the Mine Plan		**No 4**	**24.6**	**23.55**	**49.9**	**2.4**	**1.68**	**23.1**
AVERAGE		**-**	**25.6**	**23.26**	**49.0**	**2.4**	**1.58**	**23.1**

Notes:
1. Weighted average qualities estimated on MTIS.
2. CV¹ - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
3. adb = air-dried basis.

The Greenside MRD (derived from No 5, No 4, No 2 and No 1 Seam discard material) contains a Gross Tonnes In Situ estimate of 8.2 Mt of material with an average moisture content of 2.2%' an average CV1 of 15.78 MJ/kg adb and a bulk density of 1.60 g/cm (Table 21-4) Analysis of this material suggests that with beneficiation, a 21.57 MJ/kg product at a theoretical yield of approximately 56% at a cut-point density of 1.84 g/cm could be produced.

Table 21-3: Greenside MRD Coal Resource Estimate

Area	Block Area (ha)	Volume (Mm$^{3)}$	GTIS (Mt)	Ash (%)	Bulk Density (g/cm^3)	CV[1] (MJ/kg)	IM (%)	(%)SU
Bullnose	11.265	1.059	1.694	44.24	1.60	16.18	2.1	2.75
West Flank	8.202	1.539	2.462	46.22	1.60	15.50	2.0	2.97
East Flank	13.303	3.081	4.929	45.71	1.60	15.65	2.1	2.83
Upgraded	4.890	0.838	1.340	42.45	1.60	16.25	2.7	3.43
Subtotal (2019 estimate)	***32.770***	***6.516***	***10.426***	***45.17***	***1.60***	***15.78***	***2.2***	***2.93***
Less mining during 2020			2.226					
Total (2020 estimate)			**8.2**					

Note:
1. GTIS = Gross Tonnes *In Situ*

21.3.1. Reconciliation to the Previous Resource Estimate

Although the two estimates appear to be very similar, they are not comparable due to a difference in the seams/sub-seams selected for resource estimation by the Company. This has resulted in an under-estimation by the Company of between 15 and 20 Mt, although it is not possible to reconcile the two estimates. SRK has consulted with the Company's Resource Geology Specialist; who concurs with this finding.

The differences between the SRK Coal Resource estimates (65.37 Mt) and those of the Company (65.8 Mt) are explained by the following:

- The difference in the seams/sub-seams selection (between 15 and 20 Mt). The Company did not select the full seam when estimating the Coal Resources, but only selected sub-seams; this was done in error and not done intentionally. The impact occurs where a seam is labelled with the full seam name in the model, and not with sub-seam names. For good resource estimation practice, the full seam name should always be included when specifying the seams and sub-seams for estimating the Coal Resources. It should be noted that the sub-seams occur in the identical footprint to the full seam, so there is no change in area, only a change in the vertical thickness of the estimate;
- The exclusion by SRK of certain polygons in the Central Block (approximately 9.0 Mt);
- The downgrading of three polygons in the East Block from Indicated to Inferred Coal Resource category, with a resultant increase in the geological loss of 2.5% (0.4 Mt);
- SRK applied both a minimum and maximum theoretical mining height, which was not applied by the Company (1.90 Mt); and
- Mining between December 2019 and December 2020 (forecast to total 4.65 Mt).

The difference in the estimates is material, but SRK believes that it has been adequately explained in the points above.

21.4. Rock Engineering

Greenside has comprehensive procedures in place for managing rock engineering risks. The roof conditions are generally very good and operational discipline and compliance appear to be satisfactory. The TARP system is generally effective and hazardous conditions appear to be identified and addressed. There are a few exceptions, but these are addressed through the systems. Subsidence protection and undermining of surface structures appears to be well managed.

21.5. Mining

The mine plan is designed to extract the maximum remaining reserves in the No 4 Seam whilst fully utilising the existing infrastructure and underground equipment. The plan is scheduled to maximise the throughput of raw coal and to maintain the high productivity of the underground equipment; this is aimed at countering the impact of the reducing mining height and product yield. As the mine has a limited life of approximately six years based on the current reserves, the evaluation of additional options to extend the life through pillar recovery must be completed. The additional revenue streams from the MRD need to be exploited wherever possible. There is limited mining space available, so the mining sequence is not easily adapted. The flexibility to move mining sections when difficult conditions are encountered is not available. Early termination of mining panels will lead to a reduced LoM.

21.5.1. Ventilation and Cooling

Flammable gas (methane) and coal dust explosions are one of the principle hazards in underground coal mines. In order to prevent an accumulation of flammable gas, sufficient ventilation has to be provided in the last through roads to maintain air speeds above the critical velocity of 1.0 m/s. The ventilation quantity of 890 m^3/s provided by the main fans is more than sufficient to maintain air speeds above the minimum velocity of 1.0 m/s.

The LoM schedule prioritizes the access to the reserves in the Eastern Section. When production moves to the Eastern Section, the existing ventilation infrastructure will not be able to supply the required ventilation quantities for future mining (2020 to 2028). A brief description of the provisional plan to provide the required ventilation and improve efficiencies are as follows:

- Provide a new 4.5 m Ø up-cast shaft in the future East Block;
- Provide a new 4.5 m Ø downcast in the East Block; and
- The Life of Mine plans show the workings can be adequately ventilated.

21.6. Coal Reserve Estimates

The Coal Reserves for Greenside on a total basis[13] (100% attributable to Greenside) at 31 December 2020 are summarised in Table 21-4.

Table 21-4: Greenside Coal Reserve Statement at 31 December 2020

RoM Coal Reserves				Saleable Coal Reserves (NAR)				
Reserve Category Classification	RoM_{ar} (Mt)	Total Moisture (%)	CV^1_{adc} (kcal/kg)	Reserve Category Classification	Sales (Mt)	Practical Yield (%)	Total Moisture (%)	CV^1_{ar} (kcal/kg)
Proved	25.8	8.0	5 202	Proved Prime	16.7	64.6	8.0	6 006
				Proved Secondary	1.3	5.3	8.0	4 930
Probable	0.1	8.0	4 889	Probable Prime	0.0	63.9	8.0	5 993
				Probable Secondary	0.0	4.7	8.0	4 943
Total	**25.9**	**8.0**	**5 201**	**Total**	**18.0**	**69.8**	**8.0**	**5 927**
Inferred in Mine Plan	1.9	8.0	5 194	Prime	1.2	65.3	8.0	6 076
				Secondary	0.1	5.3	8.0	4 967

Note:
1. Assumes coal supply until 2026.
2. RoM_{ar} = Run of Mine on an as received basis
3. Coal sales quality is as received, RoM quality is air dried contaminated for comparison to 2019 estimates.
4. CV^1_{adc} = Calorific Value air dried, contaminated.
5. CV^1_{ar} = Calorific value as received.

[13] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to the Greenside Area of Responsibility and is equivalent to the term "gross" used in the AIM Mining Guidance.

21.7. Coal Processing

The plant has evolved over the years a long way from its original purpose but is adequate for the purpose with sufficient capacity for the current mine plan. The plant is also very flexible and is not the constraint on production. The primary concern would be the product delivery via Conveyor K, RLT or road routes, which need to be addressed.

21.8. Coal Discard Disposal

The following conclusions and risks were identified by SRK during the inspection of the Discard Facility:

- Additional air space provided by re-mining may be reduced should the re-mining operation be slowed down or stopped as a result of a decline in the demand for coal;
- Where coarse discard is not adequately compacted spontaneous combustion of the discard may occur;
- Discard area berms have low spots and overtopping may occur during storm events resulting in erosion of slopes;
- There is no formalised control of stormwater for drainage off discard areas to mitigate erosion of discard dumps surfaces and slopes;
- The mine plan to be revised in accordance with remining areas to prevent uncontrolled erosion down gradient;
- Low spots in slurry dam berms may result in overtopping by stormwater and erosion of slurry dam slopes and potentially failure of slurry dam slopes;
- The southern Discard Facility toe trenches effectiveness is reduced due to silt and debris build-up and vegetation growth, that may potentially affect the stability of the toe and slope;
- The New Return Water Dam minimum water level must be kept compliant to prevent ultra-violet damage to the HDPE liner. Safety nets in the New Return Water Dam to be moved back into the basin so to be effective; and
- The CCS rating of the Discard Facility and New Tailings Dam classifies as Major, and further studies are still required to determine the risk.

21.9. Infrastructure and Engineering

The mine's infrastructure is robust and sufficient to provide for the LoM requirements. The agreed NMD is also enough to supply the power requirements of the mine. Forecast capital is in the right ballpark; however operating costs can be highly influenced by year on year electricity tariff increases that are way above inflation. The electrical infrastructure inspected during the site visit appeared to be well looked after and well maintained.

21.10. Logistics

Greenside supplies coal to both the domestic and international market. For the international market, coal is supplied through the RBCT, via the RLT which is shared with other mines in the area. For the domestic market, coal is transported from site via various contractors, independent from the mine.

On-mine coal transport is by way of conveyor from the mine to the wash plants and then to the product stockpiles. From these stockpiles, the coal is sent by conveyor for loading at the RLT or onto trucks for local dispatch. Some trucking of products to the RLT also takes place by independent contractors.

21.11. Occupational Health and Safety

21.11.1. Occupational Health

The Company complies with the Occupational Hygiene and Medical Surveillance legal requirements.

Airborne Pollutants

Coal dust is the main airborne pollutant in coal mines and the cause of the occupational diseases, CWP and COAD.

The coal dust measurement results exceeding the OEL have increased from 13% in 2017 to a consolidated 36%

in 2020. In the same period, the diagnosed CWP cases decreased from five to one with zero silicosis cases.

Compared with gold mine dust, the silica content in coal dust can be classified as a low health risk (no silicosis cases diagnosed).

Most of the dust measurement samples exceeding the OELs were measured at the CM areas. Although the number of diagnosed CWP cases have decreased from 2017 to 2019, the dust measurement samples exceeding the OELs have increased from 2017 to 2019. With occupational diseases having long lagging periods before there are any symptoms of a disease, the diagnosed cases can fluctuate from year to year. However, there is a downward trend in the number of diagnosed cases.

One asbestosis case was diagnosed in 2019 and one in 2020. In terms of the baseline risk assessments, asbestos is not associated with coal seams in South African coal mines and therefore cannot be classified as an occupational health hazard at the Company. Asbestosis has a long lag period (up to 50 years) before there are symptoms of the disease. The employees may be inherited cases, who worked in asbestos environments before coming to the Company.

Noise Induced Hearing Loss

The Company has a good NIHL Programme in place.

The diagnosed NIHL cases increased slightly from two cases in 2017 to six cases 2018; thereafter they decreased to one case in 2020. With NIHL having a long lagging periods before there are any symptoms, the diagnosed NIHL cases can fluctuate from year to year. However, in the quest towards zero harm, there is a downward trend in diagnosed cases.

21.11.2. Safety

The Company has excellent risk management and risk control procedures in place which are actively followed by all levels of management. According to an external legal compliance assessment in June 2020, the Company complies with the MHS Act legal requirements. The systems and procedures are commendable, with prompt investigation of LTIs and necessary remedial actions being implemented.

In terms of the statistics, since 2013, there have been no fatalities to date, a commendable achievement for an underground Colliery.

The consistent improvement in lost time injuries from three in 2017 to a consolidated one in 2020 and the decrease in the LTIFR from 1.40 in 2017 to 0.40 in 2020 (per million man-hours) is a commendable achievement for an underground operation.

In the quest towards zero harm, the comprehensive safety improvement plans for 2020 should further reduce the number of injuries at the operations. This improvement plan can only be effective if the safety initiatives are consistently applied by all, from the management leadership teams, and supervisors down to employee level on the working faces. Zero lost time injuries in one year is achievable as proven by the Company in 2015.

21.12. Environmental and Social Compliance

Greenside is well run from an environmental perspective. The mine has an approved EMPr, several EAs and several WULs. The mine is registered as a waste producer; however, they do not have a waste management licence in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008) as this is not required.

No pre-directives or directives have been issued to the mine by any of the environmental authorities in the past two years. The colliery has an appointed Environmental Coordinator and it is currently implementing and EMS to ensure that it can meet its permit obligations and manage environmental aspects relevant to its operations. It is imperative that the mine demonstrates good environmental performance especially regarding compliance with its permit conditions and management of exceedances measured and recorded in the various monitoring programmes to avoid DMRE censure, directives and/or fines for non-compliance with permit commitments.

Greenside complies with the requirements of the MPRDA in terms of its SLP and MCIII obligations. Through adherence to the AASW3 internal policies, the site effectively manages its social performance.

21.13. Sustainability

The sustainability review of Greenside considered external factors, internal factors and sustainability reporting practices. Systematic analysis of the available information indicated that external factors such as the macro-economic environment, the impact of climate change and sustainability reporting practices pose a moderate sustainability risk to the operation. Mitigation measures for sustainability reporting practices can be implemented through brining the necessary skillsets on board on a site level. Internal factors which pose a high sustainability risk include – power supply (manufactured capital) and social license to operate (social and relational capital). Lack of local employment opportunities and follow through on human resource development (human capital) are considered to pose a moderate sustainability risk to the operations. These high and moderate risks could be mitigated through careful management plans and should not be left unattended.

21.14. Mine Closure and Liabilities

The closure liability has been assessed to ZAR554.9 million using the approach currently required by legislation and reported as the liability in December 2019. SRK understands that a provision of ZAR598.4 million has been made to the DMRE. SRK is of the opinion that Greenside has met its legal obligations around assessing and making provision for the liability. SRK is of the opinion that Greenside's assessment of liability based on commercial costs, which indicates a liability of ZAR440.6 million at end December 2019 (ZAR458.6 at end December 2020), is likely a more accurate reflection of liability as a more focussed approach has been used to determine this liability. There are potential risk items that could increase the closure liability, with these being additional covers required on the Greenside discard dump and the requirement to mitigate operational impacts of the Greenside discard dump on the shallow groundwater downstream of the dump. This could add between ZAR270 and ZAR420 million to the liability. SRK is of the opinion that Greenside has met statutory requirements and has a robust understanding of what the liability is, with future work required to refine the estimate as the end of LoM approaches.

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of December 2020.

21.15. Water Management

Surface Water Management

A stormwater management strategy for Greenside was compiled in early 2020, following an audit by a consulting engineering company. It consists of an upgrade to Lake Lucy, and a pipeline to transfer water from Lake Lucy to the new PCD, and rehabilitation of the Y2K Dam. However, until the strategy is fully implemented, Greenside remains non-compliant with GNR704.

The specific surface water risks are:

- If the Lake Lucy dam embankment fails, this will result in discharge of dirty water into the environment. This will in turn result in the contamination of surface and groundwater resources;
- In the event of a 1:50 year storm (or greater), dirty water from the dams and/or channels will be discharged to the environment. This will in turn result in the contamination of surface and groundwater resources; and
- Seepage of contaminated groundwater around the northern area of the discard dump poses a compliance and reputational risk.

Groundwater Management

The area is characterised by two major water-bearing zones; a shallow perched aquifer and a deeper fractured rock aquifer within the Karoo stratigraphy. The shallow aquifer is generally low yielding and the majority of groundwater users rely on the deeper fractured aquifer. Recharge to both aquifers is considered to be from rainfall. Groundwater flow is controlled by geological structures such as dykes, faults and contacts.

The regional groundwater levels vary from artesian conditions (zero mbgl) within the low-lying areas to 20 mbgl in the topographically elevated areas. Local groundwater levels within the Greenside area have been distorted by the mine dewatering. Groundwater levels in the underground mine workings clearly show a decline due to the ongoing groundwater abstraction. The identical trends in groundwater levels for the No 4 Seam and No 2 Seam indicate hydraulic interconnection between the two sets of mine workings.

Groundwater and surface water monitoring shows that the water downstream of the mining area has been impacted by mining activities, with elevated concentrations of sulphate and magnesium. The low pH values measured in some of the downstream boreholes and dewatering boreholes indicates acid rock drainage reactions.

It is SRK's opinion that the current dewatering strategy is sufficiently effective in maintaining groundwater levels below the current active No 4 Seam mine workings, for safe mining.

Elevated concentrations of sulphate and magnesium are expected within the mining area and the important factor is to ensure that water management is such that the affected water is not released into the receiving environment through discharge, decant or even plume movement.

The main concern therefore relating to groundwater is the post-mining decant of contaminated water, which may need treatment and management into perpetuity. If decanting occurs, pumping of water from the workings to the treatment plant will have to continue after cessation of mining.

Given the clear interconnection between the weathered and fractured aquifers, groundwater monitoring should be strictly adhered to and detailed records kept for groundwater abstraction from boreholes that pump from both aquifers.

21.16. Material Contracts

The main material contracts are the TFR and RBCT contracts. These must be maintained by consistent production of the export product and utilisation of the infrastructure.

The on-mine consumer contracts of significant value are the power supply and the equipment maintenance contracts, both closely linked to the throughput volume of the mine. At present, these are all well managed, reducing any significant risks.

21.17. Material Asset Valuation

[SV1.15]

The summary valuation for Greenside at the Valuation Date is set out in Table 21-5. The values for Greenside were derived on a 100% basis and reflect SRK's preferred value derived from the Income and Market valuation approaches. The value is intended to reflect the Market Value of the asset on a third party arms-length basis and no restriction were placed on the valuation. The effect of debt/loans and debt servicing was excluded in the compilation of the TEM used in the Income Approach valuation method, with the necessary adjustments reflected in Table 21-5.

Adjustments have been made in Table 21-5. for balance sheet items, which include cash on hand, medium- and long-term borrowings (debt) and finished product inventories. The Company confirmed to SRK that there are no hedge or derivative contracts in force.

Entries in Table 21-5 were derived in ZAR terms and converted to USD terms at the spot exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

Table 21-5: Greenside Colliery Summary Valuation (as at 31 December 2020)

Contract	Selected Value		The Company's Interest (%)	Fair Value to the Company	
	ZARm	USDm		ZARm	USDm
Greenside Colliery	2 256	136.7	100%	2 256	136.7
Sub-total	2 256	136.7		2 256	136.7
Adjustments					
Cash on hand				0	0
Medium and long-term borrowings[1]				0	0
Finished product inventories[2]				275	16.7
Exploration budget costs				Included in cash flows	
Hedge contracts – mark to market				None in force	
Environmental liabilities				Included in cash flows	
Net Greenside Value				**2 531**	**153.4**

Notes:
1 Medium and long-term borrowings are intra-company amounts that will have no cash impact on Greenside.
2 Finished product inventories are valued by the Company at the lower of cost of net realisable value. The holding value of consumables and spares inventories has been excluded.

SRK repeated the construction of Table 21-5 using the selected minimum and maximum values derived from the Income and Market valuation approaches.

SRK considers that the fair value for Greenside after adjustment for balance sheet items is ZAR3 526 million (USD239.8 million), in the range of ZAR2 941 million (USD200.1 million) to ZAR3 941 million (USD268.1 million).

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

21.18. Material Change

[12.10(b)] [SR4.1(iv), SR4.3(viii), SR5.5(iii)] [SV1.13]

The Company has observed a pronounced COVID-19-related impact on production at Greenside Colliery at the start of 2021. The Company has put in place several mitigation measures to claw back some of the production losses during 2021. However, due to ongoing concerns and uncertainties around the future impact of COVID-19, SRK has reduced the RoM and saleable production forecasts in 2021 by 5%. SRK views the downward revision for the purposes of this CPR is an appropriate measure to address the current uncertainty.

Should there be further COVID-19 infection peaks and associated lockdowns with a delayed vaccination roll-out, a similar 5% impact on 2022 forecast volumes may become necessary. SRK has not taken into consideration the potential further impact of TFR shutdowns and/or rail constraints on sales.

Based on the information provided by the Company, no material changes are expected in the Coal Resource and Coal Reserve statements. Changes resulting from the COVID-19-related impacts are not expected to be material regarding the overall Coal Resource and Coal Reserve or the remaining LoM.

21.19. Risk and Opportunities

An iterative, integrated and collaborative risk assessment was carried out using inputs from each of the project disciplines.

A total of 63 risks were evaluated across the disciplines, spanning from low to high residual risk ratings. While mitigation measures have been identified, a small number of risks are, however, are external and limited control can be applied to these. In this view, the risks range from being resilient to weak.

22. Date and Signature Page

[12.10(f)] [SR9.1(i)(ii)]

This CPR documents the Coal Resource and Coal Reserve statements on Greenside Colliery located in Mpumalanga Province of the Republic of South Africa, as requested by the Company, and is effective as at 31 December 2020. The Coal Resource and Coal Reserve Statements were prepared by SRK.

The Competent Persons (Table 22-1) take responsibility for these statements as required by the JSE Listing Rules in terms of the SAMREC Code (2016) and the LSE Listing Rules in terms of Clause 133 and Appendices I and II of the ESMA update of the CESR recommendations (2011).

The Competent Valuator has completed a valuation section in this report and takes responsibility for the valuation as required by the JSE Listing Rules in terms of the SAMVAL Code and LSE Listing Rules in terms of Paragraphs 131 to 133 and Appendices I and II of the ESMA update of the CESR recommendations (2011).

Table 22-1: List of CPs

Author	Role	Qualifications and Affiliations	Date Signed	Signature
Lesley Jeffrey	Principal Geologist CP (Coal Resources, Lead CP)	Pr.Sci.Nat, BSc (Geology), MSc (Mining), FGSSA	25/03/2021	
Norman McGeorge	Principal Mining Engineer CP (Coal Reserves)	PrEng, BSc (Mining), MSc (Mining), MSAIMM	25/03/2021	
Andrew van Zyl	Partner & Principal Consultant CV² (Asset Valuation)	BEng, MCom, FSAIMM, MIoD, MIMVAL	25/03/202	

Reviewed by:

Marcin Wertz PrEng, BSc (Eng), FSAIMM, MMCC

Partner & Principal Mining Engineer

Report Date: 25 March 2021

Effective Date: 31 December 2020

23. References/List of Data

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Appendices

Appendix 1: Data and Model Validation Results

Table A-1: Drill Hole Collar Co-ordinates and Collar Elevations

Drill Hole	Collar Co-ordinates (m)										Collar Elevation (mamsl)					End of Hole Depth (m)					Comments (Collar Co-ordinates in LO29 Cape)
	Easting					Northing															
	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	
SAC2108	-18082.00	-18082.00	0.00	-18082.00	0.00	2867617.00	2867617	0.00	2867617.00	0.00	1564.70	1564.70	0.00	1564.70	0.00	69.48	69.48	0.00	69.48	0.00	
SAC2113	-15647.00	-15647.00	0.00	-15647.00	0.00	2867527.00	2867527	0.00	2867527.00	0.00	1559.00	1559.00	0.00	1559.00	0.00	55.04	55.04	0.00	55.04	0.00	
SAC2128	-13263.00	-13263.00	0.00	-13263.00	0.00	2869336.00	2869336	0.00	2869336.00	0.00	1577.50	1577.50	0.00	1577.50	0.00	101.88	101.88	0.00	101.88	0.00	
SAC2428	-17354.00	-17354.00	0.00	-17354.00	0.00	2867099.00	2867099	0.00	2867099.00	0.00	1560.20	1560.20	0.00	1560.20	0.00	63.58	63.58	0.00	63.58	0.00	
SAC3023	-20747.00	-20747.00	0.00	-20747.00	0.00	2871318.00	2871318	0.00	2871318.00	0.00	1553.70	1553.70	0.00	1553.70	0.00	63.45	63.45	0.00	63.45	0.00	
SAC3025	-21248.00	-21248.00	0.00	-21248.00	0.00	2871615.00	2871615	0.00	2871615.00	0.00	1562.00	1562.00	0.00	1562.00	0.00	77.72	77.72	0.00	77.72	0.00	
SAC3103	-20340.00	-20340.00	0.00	-20340.00	0.00	2870405.00	2870405	0.00	2870405.00	0.00	1530.40	1530.40	0.00	1530.40	0.00	48.31	48.31	0.00	48.31	0.00	
SAC3A12	-	-19030.00	-	-19030.00	0.00	-	2873833	-	2873833.00	0.00	-	1570.92	-	1570.92	0.00	-	55.24	-	55.24	0.00	No original log
SAC3A56	-19894.00	-19894.00	0.00	-19894.00	0.00	2872999.00	2872999	0.00	2872999.00	0.00	1558.11	1558.11	0.00	1558.11	0.00	75.36	75.36	0.00	75.36	0.00	
SAC3A57	-19665.00	-19665.00	0.00	-19665.00	0.00	2872875.00	2872875	0.00	2872875.00	0.00	1555.13	1555.13	0.00	1555.13	0.00	67.36	67.36	0.00	67.36	0.00	
SAC3A59	-19935.00	-19935.00	0.00	-19935.00	0.00	2872750.00	2872750	0.00	2872750.00	0.00	1551.78	1551.78	0.00	1551.78	0.00	70.99	70.99	0.00	70.99	0.00	
SAC3A82	-	-21350.00	-	-21350.00	0.00	-	2872800	-	2872800.00	0.00	-	1581.85	-	1581.85	0.00	-	101.11	-	101.11	0.00	No original log
SAC3B24	-	-20825.00	-	-20825.00	0.00	-	2873288	-	2873288.00	0.00	-	1579.70	-	1579.70	0.00	-	103.20	-	103.20	0.00	No original log
SAC7504A	-	-21582.00	-	-21582.00	0.00	-	2872137	-	2872137.00	0.00	-	1571.92	-	1571.92	0.00	-	92.61	-	92.61	0.00	No original log
SAC7538	-	-21994.00	-	-21994.00	0.00	-	2871745	-	2871745.00	0.00	-	1568.66	-	1568.66	0.00	-	88.87	-	88.87	0.00	No original log
SAC7567	-	-21565.00	-	-21565.00	0.00	-	2871412	-	2871412.00	0.00	-	1559.55	-	1559.55	0.00	-	74.78	-	74.78	0.00	No original log
SAC7598	-22155.00	-22155.00	0.00	-22155.00	0.00	2872449.00	2872449	0.00	2872449.00	0.00	1576.82	1576.82	0.00	1576.82	0.00	94.31	94.31	0.00	94.31	0.00	
SACG009	-	-20539.00	-	-20539.00	0.00	-	2874578	-	2874578.00	0.00	-	1580.07	-	1580.07	0.00	-	86.91	-	86.91	0.00	No original log
SACG060	-19974.00	-19974.00	0.00	-19974.00	0.00	2873965.00	2873965	0.00	2873965.00	0.00	1580.58	1580.58	0.00	1580.58	0.00	65.73	65.73	0.00	65.73	0.00	
SACG062	-21100.00	-21100.00	0.00	-21100.00	0.00	2873927.00	2873927	0.00	2873927.00	0.00	1583.05	1583.05	0.00	1583.05	0.00	89.66	89.66	0.00	89.66	0.00	
SACG068	-20484.00	-20484.00	0.00	-20484.00	0.00	2871851.00	2871851	0.00	2871851.00	0.00	1556.48	1556.48	0.00	1556.48	0.00	50.72	50.72	0.00	50.72	0.00	
SACG082	-18326.00	-18326.00	0.00	-18326.00	0.00	2874060.00	2874060	0.00	2874060.00	0.00	1573.39	1573.39	0.00	1573.39	0.00	46.31	46.31	0.00	46.31	0.00	
SACG097	-17856.00	-17856.00	0.00	-17856.00	0.00	2874220.00	2874220	0.00	2874220.00	0.00	1581.71	1581.71	0.00	1581.71	0.00	58.05	58.05	0.00	58.05	0.00	
SACG1021	-	-14050.00	-	-14050.00	0.00	-	2872021	-	2872021.00	0.00	-	1578.24	-	1578.24	0.00	-	116.20	-	116.20	0.00	No original log
SACG1023	-	-14056.00	-	-14056.00	0.00	-	2872545	-	2872545.00	0.00	-	1585.04	-	1585.04	0.00	-	124.43	-	124.43	0.00	No original log
SACG106	-21363.00	-21363.00	0.00	-21363.00	0.00	2871042.00	2871042	0.00	2871042.00	0.00	1549.27	1549.27	0.00	1549.27	0.00	39.73	39.73	0.00	39.73	0.00	
SACG1088	-	-14112.00	-	-14112.00	0.00	-	2872915	-	2872915.00	0.00	-	1584.29	-	1584.29	0.00	-	126.55	-	126.55	0.00	No original log
SACG1089	-	-13714.00	-	-13714.00	0.00	-	2873218	-	2873218.00	0.00	-	1584.29	-	1584.29	0.00	-	121.97	-	121.97	0.00	No original log
SACG1169	-	-17442.00	-	-17442.00	0.00	-	2874427	-	2874427.00	0.00	-	1586.41	-	1586.41	0.00	-	74.57	-	74.57	0.00	No original log
SACG1197	-	-13056.00	-	-13056.00	0.00	-	2869768	-	2869768.00	0.00	-	1562.85	-	1562.85	0.00	-	56.69	-	56.69	0.00	No original log
SACG1222	-	-13168.00	-	-13168.00	0.00	-	2869543	-	2869543.00	0.00	-	1573.04	-	1573.04	0.00	-	68.80	-	68.80	0.00	No original log
SACG1238	-	-14306.00	-	-14306.00	0.00	-	2870510	-	2870510.00	0.00	-	1585.09	-	1585.09	0.00	-	89.66	-	89.66	0.00	No original log
SACG1270	-14527.00	-14527.00	0.00	-14527.00	0.00	2867983.00	2867983	0.00	2867983.00	0.00	1568.56	1568.56	0.00	1568.56	0.00	56.80	56.80	0.00	56.80	0.00	
SACG1274	-14954.00	-14954.00	0.00	-14954.00	0.00	2868059.00	2868059	0.00	2868059.00	0.00	1565.87	1565.87	0.00	1565.87	0.00	73.20	73.20	0.00	73.20	0.00	
SACG1279	-13523.00	-13523.00	0.00	-13523.00	0.00	2870058.00	2870058	0.00	2870058.00	0.00	1565.51	1565.51	0.00	1565.51	0.00	72.14	72.14	0.00	72.14	0.00	
SACG1289	-15230.00	-15230.00	0.00	-15230.00	0.00	2867310.00	2867310	0.00	2867310.00	0.00	1554.63	1554.63	0.00	1554.63	0.00	41.77	41.77	0.00	41.77	0.00	
SACG1295	-14256.00	-14256.00	0.00	-14256.00	0.00	2867318.00	2867318	0.00	2867318.00	0.00	1559.08	1559.08	0.00	1559.08	0.00	35.77	35.77	0.00	35.77	0.00	
SACG1344	-13547.00	-13547.00	0.00	-13547.00	0.00	2869460.00	2869460	0.00	2869460.00	0.00	1581.16	1581.16	0.00	1581.16	0.00	80.83	80.83	0.00	80.83	0.00	
SACG1345	-13321.00	-13321.00	0.00	-13321.00	0.00	2869901.00	2869901	0.00	2869901.00	0.00	1565.44	1565.44	0.00	1565.44	0.00	59.84	59.84	0.00	59.84	0.00	
SACG1347	-20823.00	-20823.00	0.00	-20823.00	0.00	2872054.00	2872054	0.00	2872054.00	0.00	1562.10	1562.10	0.00	1562.10	0.00	79.58	79.58	0.00	79.58	0.00	
SACG1353	-20736.00	-20736.00	0.00	-20736.00	0.00	2872571.00	2872571	0.00	2872571.00	0.00	1566.64	1566.64	0.00	1566.64	0.00	92.73	92.73	0.00	92.73	0.00	
SACG1354	-20920.00	-20920.00	0.00	-20920.00	0.00	2872831.00	2872831	0.00	2872831.00	0.00	1574.03	1574.03	0.00	1574.03	0.00	101.85	101.85	0.00	101.85	0.00	
SACG1359	-20867.00	-20867.00	0.00	-20867.00	0.00	2873627.00	2873627	0.00	2873627.00	0.00	1581.82	1581.82	0.00	1581.82	0.00	107.73	107.73	0.00	107.73	0.00	
SACG1374	-20169.00	-20169.00	0.00	-20169.00	0.00	2873023.00	2873023	0.00	2873023.00	0.00	1560.80	1560.80	0.00	1560.80	0.00	71.73	71.73	0.00	71.73	0.00	
SACG1384	-13309.00	-13309.00	0.00	-13309.00	0.00	2870323.00	2870323	0.00	2870323.00	0.00	1561.41	1561.41	0.00	1561.41	0.00	77.76	77.76	0.00	77.76	0.00	
SACG1389	-21063.00	-21063.00	0.00	-21063.00	0.00	2873432.00	2873432	0.00	2873432.00	0.00	1582.32	1582.32	0.00	1582.32	0.00	116.73	116.73	0.00	116.73	0.00	
SACG1391	-13639.00	-13639.00	0.00	-13639.00	0.00	2869725.00	2869725	0.00	2869725.00	0.00	1579.40	1579.40	0.00	1579.40	0.00	83.70	83.70	0.00	83.70	0.00	
SACG1406	-15588.00	-15588.00	0.00	-15588.00	0.00	2867258.00	2867258	0.00	2867258.00	0.00	1552.63	1552.63	0.00	1552.63	0.00	56.73	56.73	0.00	56.73	0.00	
SACG1427	-13421.00	-13421.00	0.00	-13421.00	0.00	2870924.00	2870924	0.00	2870924.00	0.00	1562.90	1562.90	0.00	1562.90	0.00	107.75	107.75	0.00	107.75	0.00	
SACG1447	-14113.00	-14113.00	0.00	-14113.00	0.00	2868164.00	2868164	0.00	2868164.00	0.00	1573.12	1573.12	0.00	1573.12	0.00	101.73	101.73	0.00	101.73	0.00	
SACG1466	-12754.00	-12754.00	0.00	-12754.00	0.00	2870490.00	2870490	0.00	2870490.00	0.00	1554.16	1554.16	0.00	1548.54	5.62	92.74	92.74	0.00	92.74	0.00	Collar elevation changed in model; does not appear in check for collar within 2 m of DTM
SACG1506	-20382.00	-20382.00	0.00	-20382.00	0.00	2871504.00	2871504	0.00	2871504.00	0.00	1555.52	1555.52	0.00	1555.52	0.00	80.72	80.72	0.00	80.72	0.00	
SACG1511	-21406.00	-21406.00	0.00	-21406.00	0.00	2873366.00	2873366	0.00	2873366.00	0.00	1585.44	1585.44	0.00	1585.44	0.00	152.73	152.73	0.00	152.73	0.00	
SACG1512	-21199.00	-21199.00	0.00	-21199.00	0.00	2873220.00	2873220	0.00	2873220.00	0.00	1583.24	1583.24	0.00	1583.24	0.00	122.70	122.70	0.00	122.70	0.00	
SACG1611	-21103.22	-21103.00	-0.22	-20970.75	-132.25	2871348.96	2871349	-0.04	2871761.00	-412.00	1555.46	1555.46	0.00	1560.55	-5.09	63.73	63.73	0.00	63.73	0.00	Drill hole position changed in model; no reason given on original log

Drill Hole	Collar Co-ordinates (m)										Collar Elevation (mamsl)					End of Hole Depth (m)					Comments (Collar Co-ordinates in LO29 Cape)
	Easting					Northing															
	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	
SACG182	-18103.00	-18103.00	0.00	-18103.48	0.48	2867530.00	2867530	0.00	2867529.58	0.42	1566.70	1566.70	0.00	1566.73	-0.03	72.18	72.18	0.00	72.18	0.00	
SACG199	-20938.00	-20938.00	0.00	-20938.00	0.00	2872318.00	2872318	0.00	2872318.00	0.00	1566.10	1566.10	0.00	1566.10	0.00	89.32	89.32	0.00	89.32	0.00	
SACG221	-13375.00	-13375.00	0.00	-13375.00	0.00	2873183.00	2873183	0.00	2873183.00	0.00	1587.10	1587.10	0.00	1587.10	0.00	120.18	120.18	0.00	120.18	0.00	
SACG222	-13784.00	-13784.00	0.00	-13784.00	0.00	2872571.00	2872571	0.00	2872571.00	0.00	1584.00	1584.00	0.00	1584.00	0.00	126.18	126.18	0.00	126.18	0.00	
SACG241	-13486.00	-13486.00	0.00	-13485.99	-0.01	2869292.00	2869292	0.00	2869292.36	-0.36	1582.00	1582.00	0.00	1582.95	-0.95	107.34	107.34	0.00	107.34	0.00	
SACG244	-16882.00	-16882.00	0.00	-16881.97	-0.03	2866838.000	2866838	0.00	2866838.40	-0.40	1550.50	1550.50	0.00	1550.81	-0.31	44.36	44.36	0.00	44.36	0.00	
SACG261	-21755.00	-21755.00	0.00	-21755.17	0.17	2872833.00	2872833	0.00	2872833.15	-0.15	1583.60	1583.60	0.00	1583.67	-0.07	92.34	92.34	0.00	92.34	0.00	
SACG273	-14288.00	-14288.00	0.00	-14287.91	-0.09	2868169.00	2868169	0.00	2868169.43	-0.43	1575.00	1575.00	0.00	1575.16	-0.16	68.37	68.37	0.00	68.37	0.00	
SACG292	-16813.00	-16813.00	0.00	-16812.73	-0.27	2867117.000	2867117	0.00	2867116.63	0.37	1557.00	1557.00	0.00	1557.14	-0.14	49.69	49.69	0.00	49.69	0.00	
SACG293	-14509.00	-14509.00	0.00	-14509.00	0.00	2867615.00	2867615	0.00	2867614.20	0.80	1563.60	1563.60	0.00	1564.37	-0.77	53.32	53.32	0.00	53.32	0.00	
SACG300	-14772.00	-14772.00	0.00	-14772.00	0.00	2872218.00	2872218	0.00	2872218.00	0.00	1576.80	1576.80	0.00	1576.53	0.27	104.26	104.26	0.00	104.26	0.00	
SACG301	-14466.00	-14466.00	0.00	-14466.00	0.00	2872191.00	2872191	0.00	2872191.00	0.00	1578.80	1578.80	0.00	1579.36	-0.56	107.10	107.10	0.00	107.10	0.00	
SACG304	-14415.00	-14415.00	0.00	-14415.00	0.00	2872694.00	2872694	0.00	2872694.00	0.00	1583.80	1583.80	0.00	1584.37	-0.57	128.14	128.14	0.00	128.14	0.00	
SACG305	-14173.27	-14173.00	-0.27	-14943.00	770.00	2872469.00	2872469	0.00	2872752.00	-283.00	1584.00	1584.00	0.00	1581.00	3.00	126.30	126.30	0.00	126.30	0.00	Drill hole position changed in model; no reason given on original log
SACG309	-15010.00	-15010.00	0.00	-15010.00	0.00	2873244.00	2873244	0.00	2873244.00	0.00	1578.30	1578.30	0.00	1578.30	0.00	125.61	125.61	0.00	125.61	0.00	
SACG310	-15444.00	-15444.00	0.00	-15444.00	0.00	2873168.00	2873168	0.00	2873168.00	0.00	1570.80	1570.80	0.00	1570.80	0.00	121.89	121.89	0.00	121.89	0.00	
SACG311	-15442.00	-15442.00	0.00	-15442.00	0.00	2873462.00	2873462	0.00	2873462.00	0.00	1564.90	1564.90	0.00	1564.90	0.00	113.25	113.25	0.00	113.25	0.00	
SACG312	-15721.00	-15721.00	0.00	-15721.00	0.00	2873637.00	2873637	0.00	2873637.00	0.00	1559.70	1559.70	0.00	1559.70	0.00	110.22	110.22	0.00	110.22	0.00	
SACG314	-12666.00	-12666.00	0.00	-12666.00	0.00	2870746.00	2870746	0.00	2870746.00	0.00	1545.10	1545.10	0.00	1546.14	-1.04	89.30	89.30	0.00	89.30	0.00	
SACG329	-14918.00	-14918.00	0.00	-14918.00	0.00	2872458.00	2872458	0.00	2872458.00	0.00	1589.00	1589.00	0.00	1578.00	11.00	110.74	110.74	0.00	110.74	0.00	Collar elevation changed in model; does not appear in check for collar within 2 m of DTM
SACG345	-	-21668.00	-	-21668.00	0.00	-	2873509	-	2873509.00	0.00	-	1584.20	-	1584.20	0.00	-	103.21	-	103.21	0.00	No original log
SACG346	-	-14520.00	-	-14520.00	0.00	-	2872473	-	2872473.00	0.00	-	1581.60	-	1581.60	0.00	-	107.03	-	107.03	0.00	No original log
SACG375	-	-22090.00	-	-22090.00	0.00	-	2872729	-	2872729.00	0.00	-	1582.00	-	1582.00	0.00	-	100.59	-	100.59	0.00	No original log
SACG386	-21497.00	-21497.00	0.00	-21497.00	0.00	2871867.00	2871867	0.00	2871867.00	0.00	1565.90	1565.90	0.00	1565.90	0.00	60.88	60.88	0.00	60.88	0.00	
SACGF010	-	-19870.00	-	-19870.00	0.00	-	2873310	-	2873310.00	0.00	-	1564.70	-	1564.70	0.00	-	47.24	-	47.24	0.00	No original log
SACGF011	-19165.00	-19165.00	0.00	-19165.00	0.00	2872550.00	2872550	0.00	2872550.00	0.00	1543.30	1543.30	0.00	1543.30	0.00	37.20	37.20	0.00	37.20	0.00	
SACGF056	-	-20565.00	-	-20565.00	0.00	-	2874380	-	2874380.00	0.00	-	1575.50	-	1575.50	0.00	-	99.83	-	99.83	0.00	No original log
SACGF058	-21218.00	-21218.00	0.00	-21218.00	0.00	2872410.00	2872410	0.00	2872410.00	0.00	1570.50	1570.50	0.00	1570.50	0.00	33.64	33.64	0.00	33.64	0.00	
SACGF078	-	-20390.00	-	-20390.00	0.00	-	2874060	-	2874060.00	0.00	-	1581.50	-	1581.50	0.00	-	69.62	-	69.62	0.00	No original log
SACGF079	-	-21634.00	-	-21634.00	0.00	-	2872996	-	2872996.00	0.00	-	1585.30	-	1585.30	0.00	-	87.32	-	87.32	0.00	No original log
SACGF098	-18585.00	-18585.00	0.00	-18585.00	0.00	2870953.00	2870953	0.00	2870953.00	0.00	1536.90	1536.90	0.00	1536.90	0.00	18.80	18.80	0.00	18.80	0.00	
SACGF162	-19843.00	-19843.00	0.00	-19843.00	0.00	2871944.00	2871944	0.00	2871944.00	0.00	1547.50	1547.50	0.00	1547.50	0.00	17.00	17.00	0.00	17.00	0.00	
SACGF166	-	-19924.00	-	-19924.00	0.00	-	2871576	-	2871576.00	0.00	-	1544.20	-	1544.20	0.00	-	22.63	-	22.63	0.00	No original log
SACGF168	-	-19801.00	-	-19801.00	0.00	-	2872533	-	2872533.00	0.00	-	1549.12	-	1549.12	0.00	-	21.94	-	21.94	0.00	No original log
SACGF173	-19430.00	-19430.00	0.00	-19430.00	0.00	2872747.000	2872747	0.00	2872747.00	0.00	1552.50	1552.50	0.00	1552.50	0.00	19.79	19.79	0.00	19.79	0.00	
SACGF176	-19998.00	-19998.00	0.00	-19998.00	0.00	2872159.00	2872159	0.00	2872159.00	0.00	1551.80	1551.80	0.00	1551.80	0.00	80.37	80.37	0.00	80.37	0.00	
SACGF220	-20843.00	-20843.00	0.00	-20843.00	0.00	2873852.00	2873852	0.00	2873852.00	0.00	1581.30	1581.30	0.00	1581.30	0.00	58.15	58.15	0.00	58.15	0.00	
SACGF244	-20445.00	-20445.00	0.00	-20445.00	0.00	2873569.00	2873569	0.00	2873569.00	0.00	1578.50	1578.50	0.00	1578.50	0.00	46.10	46.10	0.00	46.10	0.00	
SACGF250	-21088.00	-21088.00	0.00	-21088.00	0.00	2872996.00	2872996	0.00	2872996.00	0.00	1580.90	1580.90	0.00	1580.90	0.00	48.32	48.32	0.00	48.32	0.00	
SACMM74	-18523.00	-18523.00	0.00	-18523.00	0.00	2873823.000	2873823	0.00	2873823.00	0.00	1561.66	1561.66	0.00	1561.66	0.00	52.74	52.74	0.00	52.74	0.00	
SACMM91	-	-19319.00	-	-19319.00	0.00	-	2873905	-	2873905.00	0.00	-	1574.35	-	1574.35	0.00	-	53.90	-	53.90	0.00	No original log
SACMV09	-18506.00	-18506.00	0.00	-18506.00	0.00	2874365.00	2874365	0.00	2874365.00	0.00	1575.82	1575.82	0.00	1575.82	0.00	55.81	55.81	0.00	55.81	0.00	
SACMV16	-18936.00	-18936.00	0.00	-18936.00	0.00	2874051.00	2874051	0.00	2874051.00	0.00	1573.9	1573.86	0.00	1573.86	0.00	52.41	52.41	0.00	52.41	0.00	
SACW408	-	-13671.95	-	-13671.95	0.00	-	2872742.48	-	2872742.48	0.00	-	1583.19	-	1583.19	0.00	-	142.96	-	142.96	0.00	No original log
SACW409	-	-14482.82	-	-14482.82	0.00	-	2871910.33	-	2871910.33	0.00	-	1570.74	-	1570.74	0.00	-	94.60	-	94.60	0.00	No original log
Number	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	

Table A-2: Seam and Sample Depths (m)

Drill Hole	Seam From Depth (m)					Seam To Depth (m)					Sample Name	Sample From Depth (m)					Sample To Depth (m)					Sample Coal Recovery (%)		Partings		Comments
	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference		Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB	Included in Sample?	Parting Code (if excluded)	
SAC2108	35.10	35.10	0.00	34.25	0.85						2108G	35.10	35.10	0.00	35.10	0.00	36.83	36.83	0.00	36.83	0.00					S4 in model = S4T+S4S. Original Log starts at S4A
SAC2108						38.05	38.05	0.00	38.05	0.00	2108F	36.83	36.83	0.00	36.83	0.00	38.05	38.05	0.00	38.05	0.00					
SAC2113	22.64	22.64	0.00	22.64	0.00						2113J	22.64	22.64	0.00	22.64	0.00	24.57	24.57	0.00	24.57	0.00	100	100	No	0	
SAC2113											2113I	24.57	24.57	0.00	24.57	0.00	25.75	25.75	0.00	25.75	0.00	100	100	No	0	
SAC2113											2113H	25.75	25.75	0.00	25.75	0.00	27.24	27.24	0.00	27.24	0.00	100	100	No	0	
SAC2113						29.45	29.45	0.00	29.45	0.00	2113G	27.24	27.24	0.00	27.24	0.00	29.45	29.45	0.00	29.45	0.00	100	100	No	0	
SAC2128	64.61	64.61	0.00	64.61	0.00						2128J	64.61	64.61	0.00	64.61	0.00	66.26	66.26	0.00	66.26	0.00			No	0	
SAC2128											2128I	66.26	66.26	0.00	66.26	0.00	68.03	68.03	0.00	68.03	0.00			No	0	
SAC2128						69.58	69.58	0.00	69.58	0.00	2128H	68.03	68.03	0.00	68.03	0.00	69.58	69.58	0.00	69.58	0.00			No	0	
SAC2428	34.79	34.79	0.00	34.79	0.00						2428G	34.79	34.79	0.00	34.79	0.00	37.26	37.76	-0.50	37.26	0.50					S4 in model = S4T+S4S. Original Log starts at S4A
SAC2428											2428X	-	37.76	-	37.26	0.50	-	37.53	-	37.53	0.00					Dummy sample
SAC2428						38.80	38.80	0.00	38.80	0.00	2428F	37.53	37.53	0.00	37.53	0.00	38.80	38.80	0.00	38.80	0.00					
SAC3023	39.55	39.55	0.00	Not in model	-						3023E	39.55	39.55	0.00	Not in model	-	40.46	40.46	0.00	Not in model	-		100			Sample To depths in GDB and model incorrect; typo error (40.64 should be 42.67)
SAC3023						42.67	42.67	0.00	42.67	0.00	3023D	40.46	40.46	0.00	40.46	0.00	42.67	40.64	2.03	40.64	0.00		100	No	0	
SAC3025	46.63	46.64	-0.01	46.64	0.00						3025K	46.64	46.64	0.00	Not recorded	-	48.39	48.39	0.00	Not recorded	-	98	100	No	0	
SAC3025											3025J	48.39	48.39	0.00	48.39	0.00	48.47	48.47	0.00	48.47	0.00	-	100	Yes	0	
SAC3025						49.38	49.38	0.00	49.38	0.00	3025I	48.47	48.47	0.00	Not recorded	-	49.38	49.38	0.00	Not recorded	-	-	100	No	0	
SAC3103	18.69	18.69	0.00	18.69	0.00						3103K	18.69	18.69	0.00	18.69	0.00	20.14	20.14	0.00	20.14	0.00					Qualities in the load file but not composited due to a 0.3 m depth difference in last ply
SAC3103						21.56	21.56	0.00	21.86	-0.30	3103J	20.14	20.14	0.00	20.14	0.00	21.56	21.56	0.00	21.56	0.00					
SAC3A12	-	26.11	-	26.11	0.00	-	29.40	-	29.40	0.00	3A12D	-	26.11	-	26.11	0.00	-	29.40	-	29.40	0.00	-	100	No	0	No original log
SAC3A56	-	43.91	-	43.91	0.00	-	47.20	-	47.20	0.00	3A56D	-	43.91	-	43.91	0.00	-	47.20	-	47.20	0.00	-	100	No	0	No original sample log
SAC3A57	-	36.36	-	36.36	0.00	-	39.43	-	39.43	0.00	3A57D	-	36.36	-	36.36	0.00	-	39.43	-	39.43	0.00	-	100	No	0	No original sample log
SAC3A59	-	40.20	-	40.20	0.00	-	43.17	-	43.17	0.00	3A59D	-	40.20	-	40.20	0.00	-	43.17	-	43.17	0.00	-	100	No	0	No original sample log
SAC3A82	-	-	-	75.03	-						3A82E	-	-	-	75.03	-	-	-	-	77.58	-	-	100			No original nor GDB log
SAC3A82							-	-	78.76	-	3A82D	-	-	-	78.26	-	-	-	-	78.76	-	-	100	No	0	
SAC3B24	-	72.76	-	72.76	0.00	-	75.68	-	75.68	0.00	3B24D	-	72.76	-	72.76	0.00	-	75.68	-	75.68	0.00	-	100	No	0	No original log
SAC7504A	-	63.53	-	63.53	0.00						7504AE															No original log; no qualities in the model; GDB and model sample SAC7504A = 7504AE and 7504AD in original log
SAC7504A						-	66.48	-	66.48	0.00	7504AD	-	63.53	-	63.53	0.00	-	66.48	-	66.48	0.00	-	100	No	0	
SAC7538	-	53.37	-	53.37	0.00	-	55.24	-	55.24	0.00	7538D	-	53.37	-	53.37	0.00	-	55.24	-	55.24	0.00	-	100	No	0	No original log
SAC7567	-	40.98	-	40.98	0.00	-	43.49	-	43.49	0.00	7567D	-	40.98	-	Not recorded	-	-	43.49	-	Not recorded	-	-	100	No	0	No original log; no samples or qualities in the model
SAC7598	-	63.41	-	63.41	0.00	-	67.27	-	67.27	0.00	7598D	-	63.41	-	63.41	0.00	-	67.27	-	67.27	0.00	-	100	No	0	No original log
SACG009	-	50.72	-	50.72	0.00						G009E	-	50.72	-	50.72	0.00	-	51.80	-	51.80	0.00	-	100	No	0	No original log
SACG009						-	58.93	-	58.93	0.00	G009D	-	55.58	-	55.58	0.00	-	58.93	-	58.93	0.00	-				
SACG060	59.09	59.09	0.00	59.09	0.00	62.14	62.14	0.00	62.14	0.00	G060A	59.09	59.09	0.00	59.09	0.00	62.14	62.14	0.00	62.14	0.00	-	100	No	0	S4 also represented as "No.4 Select Seam"
SACG062	82.31	82.31	0.00	82.31	0.00	85.59	85.59	0.00	85.59	0.00	G062A	82.31	82.31	0.00	82.31	0.00	85.59	85.59	0.00	85.59	0.00	-	100	No	0	S4 also represented as "No.4 Select Seam"
SACG068	45.64	45.64	0.00	45.64	0.00	48.79	48.79	0.00	48.79	0.00	G068A	45.64	45.64	0.00	45.64	0.00	48.79	48.79	0.00	48.79	0.00	-	100	No	0	
SACG082	40.02	40.02	0.00	40.02	0.00	43.16	43.16	0.00	43.16	0.00	G082A	40.02	40.02	0.00	40.02	0.00	43.16	43.16	0.00	43.16	0.00	-	100	No	0	S4 also represented as "No.4 Select Seam"
SACG097	50.72	50.72	0.00	50.72	0.00	54.50	54.50	0.00	54.50	0.00	G097A	50.72	50.72	0.00	50.72	0.00	54.50	54.50	0.00	54.50	0.00	-	100	No	0	
SACG1021	-	77.50	-	77.50	0.00	84.06	84.06	0.00	84.06	0.00	G1021D	-	77.50	-	77.50	0.00	-	84.06	-	84.06	0.00	-	100	No	0	No original log
SACG1023	-	86.05	-	86.05	0.00	-	91.59	-	91.59	0.00	G1023D	-	86.05	-	86.05	0.00	-	91.59	-	91.59	0.00	-	100	No	0	No original log
SACG106	31.03	31.03	0.00	31.03	0.00	33.76	33.76	0.00	33.76	0.00	G106A	31.03	31.03	0.00	31.03	0.00	33.76	33.76	0.00	33.76	0.00	-	100	No	0	
SACG1088	-	90.04	-	90.04	0.00	-	93.99	-	93.99	0.00	G1088E	-	90.04	-	90.04	0.00	-	93.99	-	93.99	0.00	-	100	No	0	No original log
SACG1089	-	91.96	-	91.96	0.00	-	93.63	-	93.63	0.00	G1089D	-	91.96	-	91.96	0.00	-	93.63	-	93.63	0.00	-	100	No	0	No original log
SACG1169	-	66.83	-	66.83	0.00	-	70.93	-	70.93	0.00	G1169A	-	66.83	-	66.83	0.00	-	70.93	-	70.93	0.00	-	100	No	0	No original log
SACG1197	-	49.69	-	49.69	0.00						G1197B	-	49.69	-	49.69	0.00	-	51.65	-	51.65	0.00	-	100	No	0	No original log
SACG1197						-	54.18	-	54.18	0.00	G1197A	-	51.65	-	51.65	0.00	-	54.18	-	54.18	0.00	-	100	No	0	
SACG1222	-	61.76	-	61.76	0.00						G1222B	-	61.76	-	61.76	0.00	-	63.81	-	63.81	0.00	-	100	No	0	No original log
SACG1222						-	66.85	-	66.85	0.00	G1222A	-	63.81	-	63.81	0.00	-	66.85	-	66.85	0.00	-	100	No	0	
SACG1238	-	85.61	-	85.61	0.00						G1238B	-	85.61	-	85.61	0.00	-	87.19	-	87.19	0.00	-	100	No	0	No original log
SACG1238						-	88.92	-	88.92	0.00	G1238A	-	87.19	-	87.19	0.00	-	88.92	-	88.92	0.00	-	100	No	0	
SACG1270	51.90	51.90	0.00	51.90	0.00						G1270B	51.90	51.90	0.00	51.90	0.00	53.70	53.70	0.00	53.70	0.00	Not recorded	100	No	0	
SACG1270						56.71	56.71	0.00	56.71	0.00	G1270A	53.70	53.70	0.00	53.70	0.00	56.71	56.71	0.00	56.71	0.00	Not recorded	100	No	0	
SACG1274	45.87	48.63	-2.76	48.63	0.00						G1274E	46.39	45.87	0.52	45.87	0.00	48.09	48.09	0.00	48.09	0.00	Not recorded	100	No	0	Top 2.76 m recorrelated to S4U and P4 in GDB and model
SACG1274											G1274D	48.35	48.09	0.26	48.09	0.00	48.63	48.63	0.00	48.63	0.00	Not recorded	100	No	0	

Drill Hole	Seam From Depth (m)					Seam To Depth (m)					Sample Name	Sample From Depth (m)					Sample To Depth (m)					Sample Coal Recovery (%)		Partings		Comments
	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference		Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB	Included in Sample?	Parting Code (if excluded)	
SACG1274						52.13	52.13	0.00	52.13	0.00	G1274C	49.48	48.63	0.85	48.63	0.00	50.70	52.13	-1.43	52.13	0.00	Not recorded	100	No	0	(samples G1274E and G1274D); original sample log does not match sample details in original lithology log
SACG1279	63.88	63.88	0.00	63.88	0.00						G1279B	63.88	63.88	0.00	63.88	0.00	65.63	65.63	0.00	65.63	0.00	Not recorded	100	No	0	
SACG1279						68.23	68.23	0.00	68.23	0.00	G1279A	65.63	65.63	0.00	65.63	0.00	68.23	68.23	0.00	68.23	0.00	Not recorded	100	No	0	
SACG1289	34.70	34.79	-0.09	34.79	0.00						G1289B	34.79	34.79	0.00	34.79	0.00	36.54	36.54	0.00	36.54	0.00	Not recorded	100	No	0	
SACG1289						39.03	39.03	0.00	39.03	0.00	G1289A	36.54	36.54	0.00	36.54	0.00	39.03	39.03	0.00	39.03	0.00	Not recorded	100	No	0	
SACG1295	28.25	28.25	0.00	28.25	0.00						G1295B	28.61	28.25	0.36	28.25	0.00	30.97	30.97	0.00	30.97	0.00	Not recorded	100	No	0	
SACG1295						34.75	34.75	0.00	34.75	0.00	G1295A	30.97	30.97	0.00	30.97	0.00	34.75	34.75	0.00	34.75	0.00	Not recorded	100	No	0	
SACG1344	73.41	73.41	0.00	73.41	0.00						G1344B	73.41	73.41	0.00	73.41	0.00	75.36	75.36	0.00	75.36	0.00	Not recorded	100	No	0	
SACG1344						78.34	78.34	0.00	78.34	0.00	G1344A	75.36	75.36	0.00	75.36	0.00	78.34	78.34	0.00	78.34	0.00	Not recorded	100	No	0	
SACG1345	54.72	54.72	0.00	54.72	0.00						G1345B	54.72	54.72	0.00	54.72	0.00	56.52	56.52	0.00	56.52	0.00	Not recorded	100	No	0	
SACG1345						58.92	58.92	0.00	58.92	0.00	G1345A	56.52	56.52	0.00	56.52	0.00	58.92	58.92	0.00	58.92	0.00	Not recorded	100	No	0	
SACG1347	48.65	48.65	0.00	48.65	0.00	51.75	51.75	0.00	51.75	0.00	G1347E	48.65	48.65	0.00	48.65	0.00	51.75	51.75	0.00	51.75	0.00	Not recorded	100	No	0	
SACG1353	56.50	56.50	0.00	56.50	0.00						G1353F	56.50	56.50	0.00	56.50	0.00	58.48	58.48	0.00	58.48	0.00	Not recorded	100	No	0	
SACG1353						59.58	59.58	0.00	59.58	0.00	G1353E	58.48	58.48	0.00	58.48	0.00	59.58	59.58	0.00	59.58	0.00	Not recorded	100	No	0	
SACG1354	58.11	58.11	0.00	58.11	0.00	60.88	60.88	0.00	60.88	0.00	G1354C	58.11	58.11	0.00	58.11	0.00	60.88	60.88	0.00	60.88	0.00	Not recorded	100	No	0	
SACG1359	77.73	77.73	0.00	77.73	0.00	81.20	81.20	0.00	81.20	0.00	G1359E	77.73	77.73	0.00	77.73	0.00	81.20	81.20	0.00	81.20	0.00	Not recorded	100	No	0	
SACG1374	47.01	47.01	0.00	47.01	0.00	48.68	48.68	0.00	48.68	0.00	G1374C	47.01	47.01	0.00	47.01	0.00	48.68	48.68	0.00	48.68	0.00	Not recorded	100	No	0	
SACG1384	47.95	47.95	0.00	49.12	-1.17						G1384F	47.95	47.95	0.00	47.95	0.00	50.85	50.85	0.00	50.85	0.00	Not recorded	100	No	0	
SACG1384											G1384E	50.85	50.85	0.00	50.85	0.00	51.86	51.86	0.00	51.86	0.00	Not recorded	100	No	0	Seam From discrepancy due to exclusion of interval with abundant shaley lenses
SACG1384						54.88	54.88	0.00	54.88	0.00	G1384D	51.86	51.86	0.00	51.86	0.00	54.88	54.88	0.00	54.88	0.00	Not recorded	100	No	0	
SACG1389	82.24	82.24	0.00	82.24	0.00	86.88	86.88	0.00	86.88	0.00	G1389D	82.24	82.24	0.00	82.24	0.00	86.88	86.88	0.00	86.88	0.00	Not recorded	100	No	0	
SACG1406	32.96	32.96	0.00	32.96	0.00	35.82	35.82	0.00	35.82	0.00	G1406D	32.96	32.96	0.00	32.96	0.00	35.82	35.82	0.00	35.82	0.00	Not recorded	100	No	0	
SACG1427	60.00	60.00	0.00	60.00	0.00						G1427E	60.00	60.00	0.00	60.00	0.00	61.44	61.44	0.00	61.44	0.00	Not recorded	100	No	0	
SACG1427						64.38	64.38	0.00	64.38	0.00	G1427D	61.44	61.44	0.00	61.44	0.00	64.38	64.38	0.00	64.38	0.00	Not recorded	100	No	0	
SACG1447	59.11	59.11	0.00	59.11	0.00	63.99	63.99	0.00	63.99	0.00	G1447C	59.11	59.11	0.00	59.11	0.00	63.99	63.99	0.00	63.99	0.00	Not recorded	100	No	0	
SACG1466	36.38	36.38	0.00	36.38	0.00	41.60	41.60	0.00	41.60	0.00	G1466F	36.38	36.38	0.00	36.38	0.00	37.81	37.81	0.00	37.81	0.00					
SACG1506	40.97	40.97	0.00	40.97	0.00	43.76	43.76	0.00	43.76	0.00	G1506D	40.97	40.97	0.00	40.97	0.00	43.76	43.76	0.00	43.76	0.00	Not recorded	100	No	0	
SACG1511	80.93	80.93	0.00	80.93	0.00						G1511F	80.93	80.93	0.00	80.93	0.00	82.93	82.93	0.00	82.93	0.00	Not recorded	100	No	0	
SACG1511						84.85	84.85	0.00	84.85	0.00	G1511E	82.93	82.93	0.00	82.93	0.00	84.85	84.85	0.00	84.85	0.00	Not recorded	100	No	0	
SACG1512	81.19	81.19	0.00	81.19	0.00						G1512F	81.19	81.19	0.00	81.19	0.00	82.25	82.25	0.00	82.25	0.00	Not recorded	100	No	0	
SACG1512											G1512E	82.25	82.25	0.00	82.25	0.00	83.68	83.68	0.00	83.68	0.00	Not recorded	100	No	0	
SACG1512						84.54	84.54	0.00	84.54	0.00	G1512D	83.68	83.68	0.00	83.68	0.00	84.54	84.54	0.00	84.54	0.00	Not recorded	100	No	0	
SACG1611	47.83	47.83	0.00	47.83	0.00	52.12	52.12	0.00	52.12	0.00	G1611B	47.83	47.83	0.00	47.83	0.00	52.12	52.12	0.00	52.12	0.00	Not recorded	100	No	0	Model load file doesn't contain unique samples - all G1611
SACG182	39.29	39.29	0.00	39.29	0.00						G182E	39.29	39.29	0.00	39.29	0.00	41.05	41.05	0.00	41.05	0.00	Not recorded	100	No	0	
SACG182											G182Z	41.05	41.05	0.00	41.05	0.00	41.43	41.43	0.00	41.43	0.00	Not recorded	100	Yes	3	
SACG182						42.41	42.41	0.00	42.41	0.00	G182D	41.43	41.43	0.00	41.43	0.00	42.41	42.41	0.00	42.41	0.00	Not recorded	100	No	0	
SACG199	48.31	48.31	0.00	48.31	0.00	51.10	51.10	0.00	51.10	0.00	G199D	48.31	48.31	0.00	48.31	0.00	51.10	51.10	0.00	51.10	0.00	Not recorded	100	No	0	
SACG221	72.60	72.60	0.00	72.60	0.00						G221F	72.60	72.60	0.00	72.60	0.00	74.50	74.50	0.00	74.50	0.00	Not recorded	100	No	0	
SACG221						77.38	77.38	0.00	77.38	0.00	G221E	74.50	74.50	0.00	74.50	0.00	77.38	77.38	0.00	77.38	0.00	Not recorded	100	No	0	
SACG222	80.83	80.60	0.23	80.60	0.00						G222G	80.83	80.60	0.23	80.60	0.00	82.20	82.20	0.00	82.20	0.00	Not recorded	100	No	0	
SACG222											G222Z	82.20	82.20	0.00	82.20	0.00	82.81	82.81	0.00	82.81	0.00	Not recorded	100	Yes	3	
SACG222						86.54	86.54	0.00	86.54	0.00	G222F	82.81	82.81	0.00	82.81	0.00	86.54	86.54	0.00	86.54	0.00	Not recorded	100	No	0	
SACG241	70.70	72.38	-1.68	72.38	0.00						G241F	70.70	70.70	0.00	Not included	-	71.37	71.37	0.00	Not included	-	Not recorded	100	No	0	
SACG241											G241E	71.37	71.37	0.00	Not included	-	72.80	72.80	0.00	Not included	-	Not recorded	100	No	0	Top 1.68 m recorrelated to S4U and part of S4T in GDB and model; no qualities in the model
SACG241						77.75	77.75	0.00	77.75	0.00	G241D	72.80	72.80	0.00	Not included	-	77.75	77.75	0.00	Not included	-	Not recorded	100	No	0	
SACG261	78.80	78.80	0.00	78.80	0.00						G261B	78.80	78.80	0.00	Not included	-	80.40	80.40	0.00	Not included	-	Not recorded	No data	No	0	Sample B = S4T
SACG261						81.80	81.80	0.00	81.80	0.00	G261A	80.40	80.40	0.00	80.40	0.00	81.80	81.80	0.00	81.80	0.00	Not recorded	100	No	0	
SACG292	39.95	39.95	0.00	39.95	0.00						G292B	39.95	39.95	0.00	39.95	0.00	41.35	41.35	0.00	41.35	0.00	Not recorded	100	No	0	
SACG292						43.25	43.25	0.00	43.25	0.00	G292A	41.35	41.35	0.00	41.35	0.00	43.25	43.25	0.00	43.25	0.00	Not recorded	100	No	0	
SACG293	42.20	42.20	0.00	42.20	0.00						G293B	42.20	42.20	0.00	42.20	0.00	42.60	42.60	0.00	42.60	0.00	Not recorded	100	No	0	
SACG293						47.05	47.05	0.00	47.05	0.00	G293A	42.60	42.60	0.00	42.60	0.00	47.05	47.05	0.00	47.05	0.00	Not recorded	100	No	0	
SACG300	64.60	66.35	-1.75	64.60	1.75						G300E	64.60	64.60	0.00	64.60	0.00	66.35	66.35	0.00	66.35	0.00	Not recorded	100	No	0	Division between S4T and S4S differs between GDB and original log/model
SACG300						69.90	69.90	0.00	69.90	0.00	G300D	66.35	66.35	0.00	66.35	0.00	69.90	69.90	0.00	69.90	0.00	Not recorded	100	No	0	
SACG301	67.98	67.98	0.00	67.98	0.00						G301E	67.98	67.98	0.00	67.98	0.00	69.70	69.70	0.00	69.70	0.00	Not recorded	100	No	0	
SACG301						73.20	73.20	0.00	73.20	0.00	G301D	69.70	69.70	0.00	69.70	0.00	73.20	73.20	0.00	73.20	0.00	Not recorded	100	No	0	
SACG304	88.45	88.45	0.00	88.45	0.00						G304E	88.45	88.45	0.00	88.45	0.00	90.20	90.20	0.00	90.20	0.00	Not recorded	100	No	0	

Drill Hole	Seam From Depth (m)					Seam To Depth (m)					Sample Name	Sample From Depth (m)					Sample To Depth (m)					Sample Coal Recovery (%)		Partings		Comments
	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference		Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB	Included in Sample?	Parting Code (if excluded)	
SACG304						94.02	94.02	0.00	94.02	0.00	G304D	90.20	90.20	0.00	90.20	0.00	94.02	94.02	0.00	94.02	0.00	Not recorded	100	No	0	
SACG305	87.80	87.80	0.00	87.80	0.00						G305E	87.80	87.80	0.00	87.80	0.00	89.55	89.55	0.00	89.55	0.00	Not recorded	100	No	0	
SACG305						93.25	93.25	0.00	93.25	0.00	G305D	89.55	89.55	0.00	89.55	0.00	93.25	93.25	0.00	93.25	0.00	Not recorded	100	No	0	
SACG309	88.95	88.95	0.00	88.95	0.00						G309F	88.95	88.95	0.00	88.95	0.00	91.20	91.20	0.00	91.20	0.00	Not recorded	100	0.00	0	
SACG309											G309E	91.20	91.20	0.00	91.20	0.00	92.40	92.40	0.00	92.40	0.00	Not recorded	100	0.00	0	
SACG309											No sample	92.40	92.40	0.00	Not in model	-	92.90	92.90	0.00	Not in model	-				3	Not sampled
SACG309						95.05	95.05	0.00	92.40	2.65	G309D	92.90	92.90	0.00	Not in model	-	95.05	95.05	0.00	Not in model	-	Not recorded	100	No	0	Lower part of seam not in model
SACG310	85.80	85.80	0.00	85.80	0.00						G310E	85.80	85.80	0.00	85.80	0.00	87.65	87.65	0.00	87.65	0.00	Not recorded	100	No	0	
SACG310						91.60	91.60	0.00	91.60	0.00	G310D	87.65	87.65	0.00	87.65	0.00	91.60	91.60	0.00	91.60	0.00	Not recorded	100	No	0	
SACG311	76.78	76.78	0.00	76.78	0.00						G311F	76.78	76.78	0.00	76.78	0.00	78.80	78.80	0.00	78.80	0.00	Not recorded	100	No	0	
SACG311											G311E	78.80	78.80	0.00	78.80	0.00	80.75	80.75	0.00	80.75	0.00	Not recorded	100	No	0	
SACG311											No sample	80.75	80.75	0.00	Not in model	-	81.90	81.90	0.00	Not in model	-					Not sampled
SACG311						80.75	80.75	0.00	80.75	0.00	G311D	81.90	81.90	0.00	81.90	0.00	83.20	83.20	0.00	83.20	0.00					
SACG312	74.75	74.75	0.00	74.75	0.00						G312F	74.75	74.75	0.00	74.75	0.00	75.83	75.83	0.00	75.83	0.00	Not recorded	100	No	0	
SACG312						78.23	78.23	0.00	78.23	0.00	G312E	75.83	75.83	0.00	75.83	0.00	78.23	78.23	0.00	78.23	0.00	Not recorded	100	No	0	
SACG314	39.24	39.24	0.00	40.00	-0.76						G314F	39.24	39.24	0.00	Not in model	-	40.93	40.93	0.00	Not in model	-	Not recorded	100	No	0	Top 0.76 m excluded from S45T in model (shale with thin coal leaf above)
SACG314						46.21	46.21	0.00	46.21	0.00	G314E	40.93	40.93	0.00	40.93	0.00	46.21	46.21	0.00	46.21	0.00	Not recorded	100	No	0	
SACG329	75.00	75.00	0.00	75.00	0.00						G329E	75.00	75.00	0.00	Not in model	Not in model	76.75	76.75	0.00	Not in model	Not in model	Not recorded	No data	No data	0	2018 drill hole - not yet in model
SACG329						80.30	80.30	0.00	80.30	0.00	G329D	76.75	76.75	0.00	Not in model	Not in model	80.30	80.30	0.00	Not in model	Not in model	Not recorded	No data	No data	0	
SACG345	-	78.29	-	78.29	0.00	-	79.95	-	79.95	0.00	G345A	-	78.29	-	Not in model	Not in model	-	79.95	-	Not in model	Not in model	-	100	No	0	No original log; 2018 drill hole - not yet in model
SACG346	-	78.00	-	78.00	0.00						G346E	-	78.00	-	Not in model	Not in model	-	79.46	-	Not in model	Not in model	-	100	No	0	
SACG346											G346D	-	79.46	-	Not in model	Not in model	-	79.72	-	Not in model	Not in model	-	100	No	0	No original log; 2018 drill hole - not yet in model
SACG346						-	83.20	-	83.20	0.00	G346C	-	79.72	-	Not in model	Not in model	-	83.20	-	Not in model	Not in model	-	100	No	0	
SACG375	-	69.82	-	69.82	0.00	-	71.05	-	71.05	0.00	G375C	-	69.82	-	Not in model	Not in model	-	71.05	-	Not in model	Not in model	-	100	No	0	No original log; 2018 drill hole - not yet in model
SACGF010	-	41.52	-	41.52	0.00	-	44.34	-	44.34	0.00	GF010A	-	41.52	-	Not in model	-	-	44.34	-	Not in model	-	-			0	No original log; sample data not in model
SACGF056	-	66.50	-	66.50	0.00	-	70.00	-	70.00	0.00	GF056F	-	66.50	-	66.50	0.00	-	70.00	-	70.00	0.00	-	100	No	0	No original log
SACGF078	-	65.36	-	65.36	0.00						GF078B	-	65.36	-	65.36	0.00	-	66.93	-	66.93	0.00	-				No original log
SACGF078						-	68.44	-	68.44	0.00	GF078A	-	66.93	-	66.93	0.00	-	68.44	-	68.44	0.00	-	100	No	0	
SACGF079	-	81.82	-	81.82	0.00						GF079C	-	81.82	-	81.82	0.00	-	82.89	-	82.89	0.00	-				No original log; not sampled between 82.89 and 83.03 m
SACGF079											No sample	-	82.89	-	-	-	-	83.03	-	-	-					
SACGF079											GF079B	-	83.03	-	83.03	0.00	-	83.68	-	83.68	0.00	-				
SACGF079						-	85.64	-	85.64	0.00	GF079A	-	83.68	-	83.68	0.00	-	85.64	-	85.64	0.00	-	100	No	0	
SACGF166	-	20.41	-	-	-	-	-	-	-	-	No sample	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No original log; hole drilled short; only intersected S4A
SACGF168	-	20.01	-	-	-	-	-	-	-	-	No sample	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No original log; hole drilled short; only intersected S4A
SACMM74	25.31	25.31	0.00	25.31	0.00	28.04	28.04	0.00	28.04	0.00	MM74D	25.31	25.31	0.00	25.31	0.00	28.04	28.04	0.00	28.04	0.00	Not recorded	100	No	0	
SACMM91	-	25.49	-	25.49	0.00	-	28.11	-	28.11	0.00	MM91D	-	25.49	-	25.49	0.00	-	28.11	-	28.11	0.00	-	100	No	0	No original log
SACMV09	24.49	24.49	0.00	24.49	0.00	27.81	27.81	0.00	27.81	0.00	MV09D	24.49	24.49	0.00	24.49	0.00	27.81	27.81	0.00	27.81	0.00	Not recorded	100	No	0	
SACMV16	23.82	23.82	0.00	23.82	0.00	27.10	27.10	0.00	27.10	0.00	MV16D	23.82	23.82	0.00	23.82	0.00	27.10	27.10	0.00	27.10	0.00	Not recorded	100	No	0	
SACW408	-	81.86	-	81.86	0.00						W408O	-	81.86	-	81.86	0.00	-	82.84	-	82.84	0.00	-	100	No	0	
SACW408											W408N	-	82.84	-	82.84	0.00	-	83.97	-	83.97	0.00	-	100	No	0	
SACW408											W408M	-	83.97	-	83.97	0.00	-	84.87	-	84.87	0.00	-	100	No	0	
SACW408											W408L	-	84.87	-	84.87	0.00	-	85.81	-	85.81	0.00	-	100	No	0	No original log
SACW408											W408K	-	85.81	-	85.81	0.00	-	86.59	-	86.59	0.00	-	100	No	0	
SACW408						-	87.21	-	87.21	0.00	W408J	-	86.59	-	86.59	0.00	-	87.21	-	87.21	0.00	-	100	No	0	
SACW409	-	56.13	-	Not in model	-						W409B	-	60.00	-	Not in model	-	-	61.27	-	Not in model	-	-	100	No	0	No original log; not in model; top 3.87 m not sampled
SACW409						-	62.44	-	Not in model	-	W409A	-	61.27	-	Not in model	-	-	62.44	-	Not in model	-	-	100	No	0	
Number	87	87	87	87	87	87	87	87	87	87	156	155	155	155	155	155	155	155	155	155	155	138	135	136	138	

Table A-3: Calorific Value (MJ/kg) per Sample

Drill Hole	Sample Name	CV (MJ/kg) Original Log	GDB Log	Difference	Model	Difference	Comment
SAC2108	2108L	21.38	21.38	0.00	21.38	0.00	
SAC2108	2108K	-	18.30	-	18.30	0.00	
SAC2108	2108J	17.03	17.03	0.00	17.03	0.00	
SAC2108	2108I	21.47	21.47	0.00	21.47	0.00	No values in original log except RD for samples K and H; both are dummy samples
SAC2108	2108H	-	-	-	-	-	
SAC2108	2108G	24.90	24.90	0.00	24.90	0.00	
SAC2108	2108F	20.82	20.82	0.00	20.82	0.00	
SAC2113	2113J	15.54	15.54	0.00	15.54	0.00	
SAC2113	2113I	21.25	21.35	-0.10	21.25	0.10	
SAC2113	2113H	16.46	16.37	0.09	16.37	0.00	
SAC2113	2113G	25.84	25.84	0.00	25.84	0.00	
SAC2128	2128J	22.34	22.34	0.00	22.34	0.00	
SAC2128	2128I	25.40	25.40	0.00	25.40	0.00	
SAC2128	2128H	25.52	25.53	-0.01	25.53	0.00	
SAC2428	2428X	-	9.32	-	9.32	0.00	
SAC2428	2428I	21.60	21.60	0.00	21.60	0.00	
SAC2428	2428H	19.59	19.59	0.00	19.59	0.00	Dummy sample X not in original log
SAC2428	2428G	21.99	21.99	0.00	21.99	0.00	
SAC2428	2428F	22.28	22.28	0.00	22.28	0.00	
SAC3023	3023G	-	-	-	-	-	
SAC3023	3023E	-	-	-	-	-	No GDB log; only ash recorded on original log; data not in model quality load file
SAC3023	3023D	-	-	-	-	-	
SAC3025	3025K	24.74	24.73	0.01	-	-	
SAC3025	3025J	-	6.59	-	6.59	0.00	Samples K and I CV converted by SRK to MJ/kg (CV lb/lb * 2.2573); dummy sample J not in original log
SAC3025	3025I	18.62	18.62	0.00	18.30	0.32	
SAC3103	3103M	-	18.30	-	-	-	
SAC3103	3103L	-	18.30	-	18.30	0.00	No data in original log; qualities not in the model
SAC3103	3103K	-	18.30	-	18.30	0.00	
SAC3103	3103J	-	18.30	-	18.30	0.00	
SAC3A12	3A12D	-	25.09	-	25.09	0.00	No original log
SAC3A56	3A56D	-	25.44	-	25.44	0.00	No original log
SAC3A57	3A57D	-	25.42	-	25.42	0.00	No original log
SAC3A59	3A59D	-	24.00	-	24.00	0.00	No original log
SAC3A82	3A82G	-	26.17	-	26.17	0.00	
SAC3A82	3A82F	-	20.97	-	20.97	0.00	No original log
SAC3A82	3A82E	-	22.21	-	22.21	0.00	
SAC3A82	3A82D	-	19.54	-	19.54	0.00	
SAC3B24	3B24E	-	23.27	-	23.27	0.00	No original log
SAC3B24	3B24D	-	23.09	-	23.09	0.00	
SAC7504A	7504AE	-	23.09	-	-	-	No original log; no qualities in the model
SAC7504A	7504AD	-	19.64	-	-	-	
SAC7538	7538E	-	24.77	-	24.77	0.00	No original log
SAC7538	7538D	-	24.09	-	24.09	0.00	
SAC7567	7567D	-	-	-	-	-	No original log; no sample D data in GDB log nor model quality load file
SAC7598	7598D	-	15.85	-	15.85	0.00	No original log
SACG009	G009F	-	22.81	-	22.81	0.00	
SACG009	G009E	-	9.44	-	9.44	0.00	No original log
SACG009	G009D	-	22.62	-	22.62	0.00	
SACG060	G060B	-	23.37	-	23.37	0.00	No analysis data in original log
SACG060	G060A	-	24.82	-	24.82	0.00	
SACG062	G062A	-	18.48	-	18.48	0.00	No analysis data in original log
SACG068	G068B	-	25.84	-	25.84	0.00	No analysis data in original log
SACG068	G068A	-	24.19	-	24.19	0.00	
SACG082	G082C	-	23.71	-	23.71	0.00	
SACG082	G082B	-	11.43	-	11.43	0.00	No analysis data in original log
SACG082	G082A	-	24.86	-	24.86	0.00	
SACG097	G097A	-	24.17	-	24.17	0.00	No data in original log
SACG1021	G1021D	-	20.48	-	20.48	0.00	No original log

Drill Hole	Sample Name	CV (MJ/kg)					Comment
		Original Log	GDB Log	Difference	Model	Difference	
SACG1023	G1023D	-	22.71	-	22.71	0.00	No original log
SACG106	G106A	-	19.03	-	19.03	0.00	No data in original log
SACG1088	G1088E	-	24.87	-	24.87	0.00	No original log
SACG1089	G1089D	-	23.27	-	23.27	0.00	No original log
SACG1169	G1169A	-	24.59	-	24.59	0.00	No original log
SACG1197	G1197B	-	22.41	-	22.41	0.00	No original log
SACG1197	G1197A	-	25.52	-	25.52	0.00	
SACG1222	G1222B	-	21.97	-	21.97	0.00	No original log
SACG1222	G1222A	-	25.55	-	25.55	0.00	
SACG1238	G1238B	-	25.32	-	25.32	0.00	No original log
SACG1238	G1238A	-	25.81	-	25.81	0.00	
SACG1270	G1270B	-	20.83	-	20.83	0.00	No data in original log
SACG1270	G1270A	-	26.57	-	26.57	0.00	
SACG1274	G1274C	-	24.94	-	24.94	0.00	No data in original log
SACG1279	G1279B	-	25.42	-	25.42	0.00	No data in original log
SACG1279	G1279A	-	21.82	-	21.82	0.00	
SACG1289	G1289B	-	25.05	-	25.05	0.00	No data in original log
SACG1289	G1289A	-	27.24	-	27.24	0.00	
SACG1295	G1295B	-	21.26	-	21.26	0.00	No data in original log
SACG1295	G1295A	-	26.55	-	26.55	0.00	
SACG1344	G1344B	-	22.12	-	22.12	0.00	No data in original log
SACG1344	G1344A	-	25.61	-	25.61	0.00	
SACG1345	G1345B	-	24.54	-	24.54	0.00	No data in original log
SACG1345	G1345A	-	26.15	-	26.15	0.00	
SACG1347	G1347E	-	22.30	-	22.30	0.00	No data in original log
SACG1353	G1353F	-	25.21	-	25.21	0.00	No analysis data in original log
SACG1353	G1353E	-	17.63	-	17.63	0.00	
SACG1354	G1354C	-	22.32	-	22.32	0.00	No data in original log
SACG1359	G1359E	-	21.90	-	21.90	0.00	No data in original log
SACG1374	G1374C	-	25.52	-	25.52	0.00	No data in original log
SACG1384	G1384F	-	12.63	-	12.63	0.00	No analysis data in original log
SACG1384	G1384E	-	23.14	-	23.14	0.00	
SACG1384	G1384D	-	25.32	-	25.32	0.00	
SACG1389	G1389D	-	21.29	-	21.29	0.00	No data in original log
SACG1406	G1406D	-	26.18	-	26.18	0.00	No data in original log
SACG1427	G1427E	-	17.92	-	17.92	0.00	No analysis data in original log
SACG1447	G1447C	-	24.16	-	24.16	0.00	No analysis data in original log
SACG1466	G1466G	-	15.37	-	15.37	0.00	No analysis data in original log
SACG1506	G1506D	-	23.07	-	23.07	0.00	No analysis data in original log
SACG1511	G1511F	-	26.62	-	26.62	0.00	No analysis data in original log
SACG1511	G1511E	-	11.48	-	11.48	0.00	
SACG1512	G1512F	-	22.05	-	22.05	0.00	No analysis data in original log
SACG1512	G1512E	-	22.83	-	22.83	0.00	
SACG1512	G1512D	-	16.08	-	16.08	0.00	
SACG1611	G1611B	-	23.78	-	23.78	0.00	
SACG182	G182Z	-	-	-	6.59	-	No analysis data in original log; sample Z not in original log or GDB - dummy sample?
SACG182	G182G	-	22.26	-	22.26	0.00	
SACG182	G182F	-	19.31	-	19.31	0.00	
SACG182	G182E	-	24.70	-	24.70	0.00	
SACG182	G182D	-	21.45	-	21.45	0.00	
SACG199	G199E	-	25.23	-	25.23	0.00	No analysis data in original log
SACG199	G199D	-	22.93	-	22.93	0.00	
SACG221	G221G	-	24.27	-	24.27	0.00	No analysis data in original log
SACG221	G221F	-	20.72	-	20.72	0.00	
SACG221	G221E	-	23.81	-	23.81	0.00	
SACG222	G222Z	-	-	-	6.59	-	No analysis data in original log
SACG222	G222H	-	18.62	-	18.62	0.00	
SACG222	G222G	-	23.87	-	23.87	0.00	
SACG222	G222F	-	22.78	-	22.78	0.00	
Drill Hole	Sample Name	CV (MJ/kg)					Comment

Drill Hole	Sample Name	CV (MJ/kg)					Comment
		Original Log	GDB Log	Difference	Model	Difference	
		Original Log	GDB Log	Difference	Model	Difference	
SACG241	G241G	-	20.64	-	20.64	0.00	
SACG241	G241F	-	20.72	-	-	-	No analysis data in original log; data not in model quality load file
SACG241	G241E	-	11.94	-	-	-	
SACG241	G241D	-	23.10	-	-	-	
SACG261	G261C	-	12.53	-	12.53	0.00	No analysis data in original log; sample B missing from model load file - cannot composite the seam qualities
SACG261	G261B	-	23.87	-	-	-	
SACG261	G261A	-	10.12	-	10.12	0.00	
SACG292	G292D	-	17.63	-	17.63	0.00	No analysis data in original log
SACG292	G292C	-	20.34	-	20.34	0.00	
SACG292	G292B	-	21.15	-	21.15	0.00	
SACG292	G292A	-	24.68	-	24.68	0.00	
SACG293	G293D	-	20.78	-	20.78	0.00	No analysis data in original log
SACG293	G293C	-	16.23	-	16.23	0.00	
SACG293	G293B	-	19.25	-	19.25	0.00	
SACG293	G293A	-	24.14	-	24.14	0.00	
SACG300	G300G	-	23.91	-	23.91	0.00	No analysis data in original log
SACG300	G300E	-	19.70	-	19.70	0.00	
SACG300	G300D	-	24.82	-	24.82	0.00	
SACG301	G301G	-	19.25	-	19.25	0.00	No analysis data in original log
SACG301	G301F	-	22.74	-	22.74	0.00	
SACG301	G301E	-	19.36	-	19.36	0.00	
SACG301	G301D	-	25.63	-	25.63	0.00	
SACG304	G304G	-	25.42	-	25.42	0.00	No analysis data in original log
SACG304	G304F	-	25.34	-	25.34	0.00	
SACG304	G304E	-	19.29	-	19.29	0.00	
SACG304	G304D	-	24.57	-	24.57	0.00	
SACG305	G305G	-	22.60	-	22.60	0.00	No analysis data in original log
SACG305	G305F	-	23.95	-	23.95	0.00	
SACG305	G305E	-	18.65	-	18.65	0.00	
SACG305	G305D	-	24.98	-	24.98	0.00	
SACG309	G309G	-	23.38	-	23.38	0.00	No analysis data in original log; sample D data not in model quality load file
SACG309	G309F	-	19.50	-	19.50	0.00	
SACG309	G309E	-	24.94	-	24.94	0.00	
SACG309	G309D	-	23.35	-	-	-	
SACG310	G310F	-	28.20	-	28.19	0.01	No analysis data in original log
SACG310	G310E	-	14.91	-	14.91	0.00	
SACG310	G310D	-	25.04	-	25.04	0.00	
SACG311	G311G	-	24.96	-	24.96	0.00	No analysis data in original log
SACG311	G311F	-	17.51	-	17.51	0.00	
SACG311	G311E	-	26.17	-	26.17	0.00	
SACG311	G311D	-	24.40	-	24.40	0.00	
SACG312	G312G	-	24.55	-	24.55	0.00	No analysis data in original log
SACG312	G312F	-	14.49	-	14.49	0.00	
SACG312	G312E	-	24.94	-	24.94	0.00	
SACG312	G312D	-	24.60	-	24.60	0.00	
SACG314	G314G	-	24.09	-	24.09	0.00	No analysis data in original log
SACG314	G314E	-	22.10	-	22.10	0.00	
SACG329	G329F	-	-	-	-	-	No qualities in original log nor GDB; 2018 holes - qualities not yet in model
SACG329	G329E	-	-	-	-	-	
SACG329	G329D	-	-	-	-	-	
SACG345	G345B	-	14.49	-	-	-	No original log; 2018 holes - qualities not yet in model
SACG345	G345A	-	24.94	-	-	-	
SACG346	G346F	-	24.94	-	-	-	No original log; 2018 holes - qualities not yet in model
SACG346	G346E	-	21.38	-	-	-	
SACG346	G346D	-	22.10	-	-	-	
SACG346	G346C	-	22.10	-	-	-	
SACG375	G375D	-	25.40	-	-	-	No original log; 2018 holes - qualities not yet in model
SACG375	G375C	-	16.29	-	-	-	
SACGF010	GF010A	-	-	-	-	-	Not in GDB; data not in model quality load file

Drill Hole	Sample Name	CV (MJ/kg)					Comment
		Original Log	GDB Log	Difference	Model	Difference	
Drill Hole	**Sample Name**	**CV (MJ/kg)**					**Comment**
		Original Log	**GDB Log**	**Difference**	**Model**	**Difference**	
SACGF056	GF056H	-	23.09	-	23.09	0.00	
SACGF056	GF056G	-	13.10	-	13.10	0.00	No original log
SACGF056	GF056F	-	26.24	-	26.24	0.00	
SACGF078	GF078C	-	23.97	-	23.97	0.00	
SACGF078	GF078B	-	27.14	-	27.14	0.00	No original log
SACGF078	GF078A	-	22.92	-	22.92	0.00	
SACGF079	GF079D	-	25.28	-	25.28	0.00	
SACGF079	GF079C	-	27.19	-	27.19	0.00	No original log
SACGF079	GF079B	-	27.19	-	27.19	0.00	
SACGF079	GF079A	-	13.28	-	13.28	0.00	
SACGF166	GF166A	-	26.27	-	26.27	0.00	No original log
SACGF168	GF168A	-	23.86	-	23.86	0.00	No original log
SACMM74	MM74D	-	25.12	-	25.12	0.00	No data in original log
SACMM91	MM91D	-	24.46	-	24.46	0.00	No original log
SACMV09	MV09D	-	23.17	-	23.17	0.00	No data in original log
SACMV16	MV16D	-	24.01	-	24.01	0.00	No data in original log
SACW408	W408P	-	24.37	-	24.37	0.00	
SACW408	W408O	-	20.54	-	20.54	0.00	
SACW408	W408N	-	21.00	-	21.00	0.00	
SACW408	W408M	-	23.74	-	23.74	0.00	No original log
SACW408	W408L	-	27.22	-	27.22	0.00	
SACW408	W408K	-	22.21	-	22.21	0.00	
SACW408	W408J	-	23.83	-	23.83	0.00	
SACW409	W409B	-	24.66	-	-	-	No original log; data not in model quality load file
SACW409	W409A	-	24.89	-	-	-	
Number	**201**	**201**	**201**	**201**	**201**	**201**	

Appendix 2: Risk Register and Assessment

Table B-1: Risk Register and Assessment

Discipline	Contributor	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Risk Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating
Closure	James Lake	Pollution of environment	Vandalism and theft of rehabilitation/closure infrastructure	Closure obligations not met	Likely	Moderate	High	Monitoring of post closure measures	Qualified	Medium
Closure	James Lake	Under provision for closure	Water treatment not included	Requirements to include additional funding	Likely	Moderate	High	Make provision for post closure water treatment	Effective	Medium
Closure	James Lake	Under provision for closure	Discard dump closure not sufficiently addressed	Requirements to include additional funding; uncertainty regarding legal requirements	Likely	Moderate	High	Undertake engineering design	Effective	Medium
Closure	James Lake	Under provision for closure	Clydesdale pan closure requirements not sufficiently designed	Requirements to include additional funding	Possible	Moderate	High	Undertake engineering design and implement improved design; mine through the pan as part of the LoM Extension	Qualified	High
Coal Processing	Peter Hand	Export coal line outage	Sabotage, track failure	Financial	Rare	Major	High	Work with Transnet & RBCT	Effective	Medium
Coal Processing	Peter Hand	Magnetite supply becomes unavailable	Supply failure (e.g. failure to deliver OR preferential export to China)	Washing plants cannot run	Possible	Major	Extreme	Contract with supplier & monitored, maintain good relationship with Phalabora	Effective	High
Coal Processing	Peter Hand	RLT (rail load-out terminal) outage	Sabotage, key mechanical breakdown	Financial	Possible	Major	High	Liaise with RLT	Qualified	Medium
Electrical Infrastructure	Kenneth Mahuma	Unreliable bulk power supply (load curtailment due to load shedding)	Load shedding by Eskom resulting in load curtailment for high power consumers	Disruption to production	Likely	High	Extreme	Co-generation	Qualified	High
Electrical Infrastructure	Kenneth Mahuma	High power costs	Year on year tariff increases which are above inflation	Higher operating costs than expected	Likely	Moderate	High	Introduce energy efficiency programmes, co-generation	Qualified	Medium
Electrical Infrastructure	Kenneth Mahuma	Substation fires	Use of obsolete oil circuit breakers in some substations	Damage to equipment	Possible	Minor	Medium	Replace obsolete oil circuit breakers with vacuum circuit breakers	Effective	Low
Environmental	Ashleigh Maritz and Darryll Kilian	Loss of legal licence to operate	Non-compliance to permit conditions and environmental standards	Directive issued by DMRE	Likely	Moderate	High	Implement action plans to address areas of non-compliance (e.g. amended EMPr, amended Water Use Licence Application (**WULA**))	Qualified	Low
Environmental	Ashleigh Maritz and Darryll Kilian	Reputational damage occurs	Conducting unauthorised activities	Directive issued by competent authority necessitating stoppage, financial loss	Possible	Moderate	High	Submit environmental applications for authorisation	Qualified	Low
EWRP	Bjanka Korb *et al*	Forced cessation of EWRP operation	Additional brine storage/treatment capacity is not constructed in time for when the current pond capacity is reached in 2024	Mine water overflow/decant (resulting in groundwater and surface water contamination); possible non-compliance with WUL	Possible	High	High	Spend allocated capital on brine concentration/ crystallisation technology	Effective	Low
EWRP	Bjanka Korb *et al*	Unplanned, short-term [days] plant stoppages	Poor/variable feed quality and/or no projections of feed water quality into the future	Mine water overflow/decant (resulting in groundwater and surface water contamination); possible non-compliance with WUL	Possible	High	High	Current mitigation: blending in the feed dams; however, capacity is compromised as sludge precipitates out.	Qualified	Medium
EWRP	Bjanka Korb *et al*	Unplanned, medium-term [weeks] plant stoppages	Structural failure/critical component failure due to no/deficient major maintenance/overhaul plan for future operation	Mine water overflow/decant (groundwater and surface water contamination)	Possible	Moderate	High	Develop and implement the maintenance plan for major maintenance and overhaul	Effective	Low
EWRP	Bjanka Korb *et al*	Forced cessation of EWRP operation	No gypsum storage capacity as result of no defined plan for gypsum sale post 2022	Mine water overflow/decant (groundwater and surface water contamination)	Possible	Moderate	High	Disposal in Yellowboy compartment at Bloukrans	Qualified	Medium
Geology	Katherine Black	Unforeseen changes in the seam stratigraphy resulting in the seam thinning, increased parting material, decreased qualities.	Unplanned changes in localised seam stratigraphy.	Decrease in resources, increase in dilution, reduction in coal quality and product.	Possible	Minor	Medium	Increase drill coverage with geophysical logging.	Effective Qualified	Low
Geology	Katherine Black	"Unforeseen/poorly understood geological structures resulting in incorrect resource estimates "	Insufficient exploration borehole density	"Incorrect tonnage estimates Loss of ground Loss of tonnage Extraction delays increased costs"	Rare	Moderate	Low	Increase exploration borehole density. Include all available geophysical techniques during exploration	Qualified	Low
Hydrology and Hydrogeology	Benedict Mabenge	Decant from underground workings	Rebounding of groundwater levels after cessation of mining, EWRP stoppages	Deterioration of water resources downstream of the mine	Unlikely	Moderate	Medium	Groundwater level monitoring and updates to numerical model. Maintain pumping and treatment post closure. Plan for blending feed water to EWRP.	Effective	Low
Hydrology and Hydrogeology	Benedict Mabenge	Ingress of large volumes of unplanned water into workings	Leakage from surface dams	Disruption to production, damage to equipment, increased costs, safety incidents	Unlikely	Moderate	Medium	Continue with routine maintenance of surface dams, data collection	Effective	Low
Hydrology and Hydrogeology	Benedict Mabenge	Generation of acid rock drainage	Exposure of sulphide minerals due to mining	Deterioration of water resources downstream of the mine	Possible	Moderate	High	Pumping and treating water, maintain specific groundwater levels to reduce exposure to atmosphere	Qualified	Medium
Hydrology and Hydrogeology	Benedict Mabenge	Depletion of groundwater resources	Abstraction for dewatering	Reduced water supply to neighbouring farms	Unlikely	Moderate	Medium	Groundwater level monitoring, data collection, updates to numerical model	Effective	Low
Hydrology and Hydrogeology	Bjanka Korb	Discharge of dirty water into environment	Dams not lined and insufficient capacity to store water, EWRP stoppages	Numerous contraventions of GNR704, environmental pollution occurs, damage to reputation	Almost certain	High	Extreme	Implement stormwater management strategy (install silt traps, construct more channels, upgrade water containing facilities) (noted that new RWD is HDPE lined)	Effective	Low

Discipline	Contributor	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Risk Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating
Mechanical Infrastructure	Willie Schoeman	Conveyors, mining machines or plant fires and/or pipelines damaged	Friction, mechanical failure, sabotage	Damage to equipment, loss of production	Possible	Moderate	High	Install automatic fire protection	Effective	Low
Mechanical Infrastructure	Willie Schoeman	Flooding of underground mine	Very heavy rain, inundation of pumps	loss of equipment and production	Rare	Minor	Low	Maintain emergency pumps and procedures	Effective	Low
Mine planning	LeRoux Botha	Incorrect transfer of the current resource model to the mine planning group	Poor document and version control, unauthorised access and editing rights	Unauthorised changes to the data and incorrect model data	Possible	Moderate	High	The resource model and geological interpretation have been documented and provided on a shared directory with access and editing rights controlled by a formal process (As per Underground standard AAC SD 23-35-106)	Effective	Low
Mine planning	LeRoux Botha	Inappropriate block dimensions used for generating mineable reserves	Methods for most appropriate mining of reserves not correctly documented	Incorrect planning and calculation of production volumes	Possible	Minor	Medium	Selective mining unit ("SMU") dimensions documented (As per AAC SD 23-33-002, LoM planning process)	Effective	Low
Mine planning	LeRoux Botha	The cut-off quality applied to estimate the Reserves do not confirm with AAC standards	Criteria not documented and reported.	Incorrect grades and qualities applied to the reserves resulting in unconfirmed reserve statement	Possible	Minor	Medium	Apply cut-off grades / qualities as per AAC SD 23-33-002 LoM planning process	Effective	Low
Mine planning	LeRoux Botha	Incorrect mining dilution and ore losses applied to the reserve model	Dilution and losses not justified and documented and available for audit	Unauditable dilution and losses applied in the reserve model	Possible	Minor	Medium	Apply dilution and losses as per AAC SD 23-33-002 LoM planning process	Effective	Low
Mine planning	LeRoux Botha	The reserve is not classified in accordance with the relevant reporting code	The classification is done without reference to the relevant reporting code	Reserve cannot be signed-off in accordance with the relevant reporting code	Unlikely	Moderate	Medium	Classify reserve as per AAC SD 23-33-002 LoM planning process	Effective	Low
Mine planning	LeRoux Botha	Poor reconciliation between Reserve estimates and actual production results	No formal reconciliation process between actual and planned extraction and processing	Incorrect Reserve estimation	Unlikely	Moderate	Medium	Formalise reconciliation process as per AAC SD 23-33-002 LoM planning process	Marginal	Low
Mine planning	LeRoux Botha	The Resource development plan has not been developed or is inconsistent with AAC approved strategies	Resource development does not take AAC strategies into account	unaligned LoM outcomes	Unlikely	Moderate	Medium	a minimum control standard will be developed to align the overall AAC strategy with the LoM plan	Marginal	Low
Mine planning	LeRoux Botha	A LoM plan is not available that ensures the operation is planned to meet the AAC environmental, health, safety and community commitments	Plan is not current Design criteria not based on sound engineering and technical studies	LoM plan does not meet AAC HSEC commitments The LoM plan incorporates a production / extraction schedule The LoM plan incorporates HSEC considerations, incorporates AAC standards and site specific issues The LoM plan incorporates waste management The LoM plan incorporates a closure plan	Unlikely	Moderate	Medium	LoM plan is current, available and mine design criteria and key design parameters and constraints are defined and based on sound engineering and technical studies	Effective	Low
Mine planning	LeRoux Botha	Business decision making is based on incorrect economic and evaluation assumptions	LoM plan does not consider corporate pricing and other economic assumptions	Incorrect financial model	Rare	High	Medium	The financial model in the LoM plan should be consistent with Corporate pricing and other economic assumptions (Including exchange rates, interest rates, CPI rates, price trends etc.) The financial analyst understands and has complied with corporate business evaluation and economic guidelines and standards for financial analysis and modelling	Effective	Low
Mine planning	LeRoux Botha	Inappropriate mining limits determined	Mining limits used in modelling not justifiable and auditable	Inappropriate mining limits used in mining model and reporting unauditable planning volumes	Possible	Minor	Medium	Apply mining limits as per AAC SD 23-33-002 LoM planning process	Effective	Low
Mining natural hazards	LeRoux Botha	Geological structure resulting in inaccurate or incorrect tonnage estimates due to unforeseen or poorly defined features such as: High-angle normal faulting High-angle reverse faulting Low-angle strike or thrust faulting Folding Igneous intrusions Poorly defined floor gradient High seam dip Depth of cover	Insufficient exploration borehole density	Incorrect tonnage estimates Loss of ground Loss of tonnage Extraction delays increased costs	Rare	Minor	Low	Increase exploration borehole density. Include all available geophysical techniques during exploration	Qualified	Low
Mining natural hazards	LeRoux Botha	Coal seam stratigraphy leading to inaccurate or incorrect tonnage estimates due to unforeseen or poorly defined features such as: Seam thickness Increased parting width Massive sandstone channels in roof Other seam potential lost opportunity	Insufficient exploration borehole density	Increased dilution Decreased product yield Lower profit Increased costs	Rare	Moderate	Medium	Increase exploration borehole density. Include all available geophysical techniques during exploration Grade control program is effective	Effective	Low
Mining natural hazards	LeRoux Botha	Limited Geotechnical data	Roof strata instability caused by inadequate definition of seam splitting	Fall of ground Loss of coal tonnage Loss of production Increased costs	Possible	High	High	Gas drainage strategy increased drilling	Effective	Low
Mining production	LeRoux Botha	Management does not implement full control over the mine plan	Production is allowed to continue operations without following strict adherence to a mine plan	Inconsistent and unpredictable production outputs	Possible	Moderate	High	An agreed annual operating plan is available. Consistency with the LoM plan, detail is monthly.	Effective	Medium
Mining production	LeRoux Botha	Mining operation does not conform to the agreed plan	Production does not adhere to the mine plan and process	Inconsistent and unpredictable production outputs	Possible	Moderate	High	Monthly and annual reporting of actual against budget is available and monitored.	Effective	Medium

Discipline	Contributor	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Risk Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating
								Geotechnical and hydrological monitoring processes are documented, and results are reviewed and reported monthly to ensure safe operating conditions.		
Mining production	LeRoux Botha	The short term plans are not consistent with the annual and long term plans	The short term or long term plan does not consider the other during the planning phase and 'Silo' planning takes place with different goals	Unreconcilable production plans and unpredictable outcomes	Possible	Moderate	High	Production schedules are available on a weekly and monthly basis for both coal and waste in terms of tonnes, quality and final products, are based on the annual plan and a realistic assessment of the short term equipment and fixed plant capability in the specific operating conditions known and predicted.	Effective	Low
Mining production	LeRoux Botha	The production plan is not communicated to operating personnel	Production teams are not part of an integrated planning process	Inconsistent and unpredictable production outputs	Possible	Moderate	High	Surveying processes are documented. Reviewed and plans available. Clear procedures and responsibilities for monitoring and reporting operating plan execution to ensure compliance, including regular visual inspection, meetings and periodic measurements of progress.	Effective	Low
Mining production	LeRoux Botha	The grade control methods used do not provide an appropriate level of information to ensure compliance with the mining plan	No work procedures defining the roles	Unreliable review information affecting the reconciliation process and planning cannot use information to effectively predict forward outputs	Possible	Minor	Medium	Work procedures define acceptable bench conditions and safe access to the grade control area. Documentation of the procedures covering grade control data acquisitioning, modelling, material classification, monitoring and reconciliation, including a formal process for communicating all relevant information to the operations/production crews. A minimum QA/QC procedure in place and used to review the precision and accuracy of samples and sampling methods.	Effective	Low
Mining production	LeRoux Botha	Critical data, records are not identified, collected and secured properly to allow compliance with statutory commitments	No competent person and/or high turn-over of responsible personnel. Unauthorised access data. Poor back-up facilities.	Non-conformance to statutory commitments	Rare	High	Medium	A listing of the statutory plans and reporting requirements is maintained by a nominated qualified manager, with responsibility to monitor and trigger actions. Measures ensure that only authorized persons can access and alter information. All critical records are backed up frequently or multiple copies maintained. Version control of data and information exists.	Effective	Low
Operational / Business continuity	Andrew van Zyl	Project rendered redundant due to outside circumstances	An event outside of Anglo's control, for example a sustained drop in oil price could threaten the viability of the company	Financial loss, employment terminated, closure activities triggered earlier than provisioned	Rare	Major	High	Greenside is 'still' considered to be a national strategic asset, demand for coal still prevalent. Source alternate market. Reasonable chance that asset could be sold	Qualified	Low
Rock Engineering	William Joughin	Rockfalls resulting in injuries and fatalities	Geological structures, burnt coal, guttering, not identified during TARP inspections	Health and safety	Rare	High	Medium	Currently well managed. Ongoing oversight and on the job training	Effective	Medium
Rock Engineering	William Joughin	Subsidence causing damage to surface infrastructure, such as roads, railways, powerlines and buildings	Insufficient precautions regarding pillar sizes and sinkholes in shallow areas	Legal, Corporate image, Social re-settlement; powerline needs to be moved	Rare	Major	High	Currently well managed. Ongoing oversight and on the job training	Effective	Medium
Rock Engineering	William Joughin	Rockfalls resulting in damage to equipment	Geological structures, burnt coal, guttering, not identified during TARP inspections	Financial	Unlikely	Insignificant	Low	Currently well managed. Ongoing oversight and on the job training. Ground conditions are identified using TARP	Effective	Low
Rock Engineering	William Joughin	Subsidence from historical mining	Failure of underground pillars, extraction of underground pillars by illegal miners	Causes damage to surface infrastructure, such as roads, railways, powerlines and buildings - more so to Eskom than to project itself	Almost certain	Major	Extreme	Monitoring	Marginal	High
Social	Jessica Edwards and Vassie Maharaj	Reputational damage occurs	Perceived lack of community benefit and development from mine opportunities	Protest action and work stoppage, financial loss	Possible	High	High	Implement current policies, management plans and social obligations	Qualified	Medium
Social	Jessica Edwards and Vassie Maharaj	Delays in social transitioning post closure	Ineffective tracking of constructive obligations	Reputational damage and ongoing dependency on the mine	Likely	High	Extreme	Track social obligations and implement social transitioning measures	Qualified	High
Social	Jessica Edwards Vassie Maharaj	Lease agreements have expired and/or tendency to allow lease agreements to lapse	Ineffective tracking of ease agreements.	Potential escalation in lease agreement cost, and/or loss of surface right access	Possible	Moderate	High	Track lease agreements and renew timeously	Qualified	Low
Sustainability	Lisl Fair	Onsite staff do not have the skills and capacity to perform the tasks associated with public sustainability reporting	The Anglo American Group aggregates Anglo Coal's sustainability reporting practices into the reports of the larger group	Disconnect between public reporting, and governance standards and practices at the individual operation [Greenside]	Likely	Minor	Medium	Identify necessary skillsets and equip personnel on a site level, for sustainability reporting practices Conduct periodic reporting reviews and/or updates to ensure governance standards and practices are reflected appropriately in public reports for Greenside, as in individual operation, within the larger group	Effective	Low
Coal Discard	Colin Wessels	Insufficient air-space on co-disposal discard dump for LoM	Reduced coal demand/re-mining, reduction in creation of discard deposition airspace	Increased requirement for deposition airspace - mine closure	Possible	Moderate	High	Conduct study to confirm sufficient airspace co-disposal discard dump for LoM	Qualified	Low
Coal Discard	Colin Wessels	Spontaneous combustion of discard	Inadequate discard compaction (e.g. over COVID-19 national lockdown period)	Spontaneous combustion of discard and emission of unwanted gases	Likely	Moderate	High	Ensure systems in place to complete compaction of discard.	Qualified	Low
Coal Discard	Colin Wessels	Stormwater overtopping of the discard berms	Low spots where berms are insufficient height for effective freeboard - top of discard areas sloping toward these berms	Erosion of dump slopes and deposition of discard downgradient	Likely	Moderate	High	Increase height of berms	Qualified	Low
Coal Discard	Colin Wessels	Uncontrolled flow of stormwater off discard dump	No formal stormwater control/drainage evident	Erosion of discard dump surfaces and slopes	Likely	Moderate	High	Formalise stormwater drainage	Qualified	Low
Coal Discard	Colin Wessels	Overtopping slurry dam berms	Low spots where berms are insufficient height for effective freeboard	Overtopping by stormwater, erosion of slurry dam slopes	Likely	Moderate	High	Raise low spots in berms	Qualified	Low
Coal Discard	Colin Wessels	Stormwater management in re-mining area	Analysis and revision of mine plan	Uncontrolled transport and deposition of silt/discard down gradient	Likely	Moderate	High	Revise mine plan for re-mining area	Qualified	Low

Discipline	Contributor	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Risk Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating
Coal Discard	Colin Wessels	Toe trenches on southern Discard Facility effectiveness reduced due to silt and debris build-up and vegetation growth	Toe trench not maintained, silt, debris and vegetation build-up	Toe trenches on southern Discard Facility ineffective and build-up of water potentially reducing the stability of the toe and slope.	Likely	Moderate	High	Maintain trenches and remove vegetation	Qualified	Low
TEM	Andrew van Zyl	Lower revenue (linked to price)	Lower USD price	Lower margin, reduced NPV	Possible	High	High	Some mitigation possible through product selection, alternative markets	Marginal	High
TEM	Andrew van Zyl	Lower revenue (linked to exchange rate)	Stronger ZAR:USD exchange rate	Lower margin, reduced NPV	Possible	High	High	Some mitigation possible through product selection, alternative markets	Marginal	High
TEM	Andrew van Zyl	Cost inflation	Higher than planned inflation particularly power and labour	Lower margin, reduced NPV	Possible	Minor	Medium	None	No mitigation	Medium
TEM	Andrew van Zyl	Logistics disruptions	Disruptions to the movement of people and goods as result of COVID-19 State of Disaster	Lower margin, reduced NPV	Unlikely	High	High	Declare Force Majeure	Qualified	Medium
TEM	Andrew van Zyl	Intended rail capacity unknown, when viewed as a standalone operation	No formal means to assign rail capacity for individual operations	Uncertainty for the business case in the event that Greenside is required to operate as standalone, difficulty in securing rail capacity	Rare	High	Medium	Rely on current status [Greenside as part of the collective of operations]	No mitigation	Medium

Appendix 3: Certificates of Competent Persons and Competent Valuator

CERTIFICATE OF COMPETENT PERSON

As the co-author and co-signatory of the report entitled "Independent Competent Person's Report on Greenside Colliery", I hereby state:

1. My name is Lesley Sharon Jeffrey and I am a Principal Geologist with SRK Consulting (South Africa) (Pty) Ltd, with address SRK House, 265 Oxford Road, Illovo, Johannesburg 2196, South Africa.
2. I am a geologist and am registered as a Professional Natural Scientist (Pr.Sci.Nat) (Registration number: 400115/01) through the South African Council for Natural Scientific Professions, a Fellow of the Geological Society of South Africa (Membership number: 35715) and a Member of the Fossil Fuel Foundation of Africa (Membership number: 000451).
3. I have a BSc (Geology) from the University of Cape Town, South Africa (1984) and an MSc (Mining Engineering) from the University of the Witwatersrand, South Africa (2002).
4. I have worked as a geologist for over 35 years since graduation, all of which have been in coal specialising in exploration, geological modelling and resource estimation. I am a full-time employee of SRK Consulting (South Africa) (Pty) Ltd, with designation Principal Geologist.
5. I am a 'Competent Person' as defined in the SAMREC Code.
6. The information in this report that relates to exploration results and Coal Resources is based on information compiled by me.
7. I undertook the Greenside site visit on 27 November 2019. I place reliance on the following CPs:
   - Exploration, Geology and Coal Resources: Katherine Forbes BSc.(Hons) (Geology) 2006, who is a QP for coal with 13 years' appropriate coal experience; and
   - Mining and Coal Reserves: Norman McGeorge BSc (Mining) 1986 MSc (Mining) 1990, who is a QP for coal with over 30 year's appropriate coal experience.
8. I am responsible for the reporting of the Coal Resources for Greenside Colliery as set out in this CPR.
9. I am not aware of any material fact or material change with respect to the subject matter of the CPR that is not reflected in the CPR, the omission of which would make the CPR misleading.
10. I declare that this CPR appropriately reflects my professional view.
11. I am independent of the Company.
12. I have read the SAMREC Code (2016) and confirm that the CPR has been prepared in accordance with guidelines of the SAMREC Code.
13. I do not have, nor do I expect to receive, a direct or indirect interest in Greenside or the Company.
14. At the Effective Date of the CPR, to the best of my knowledge, information and belief, the CPR contains all scientific and technical information that is required to be disclosed to make the report not misleading.

Dated at 25 March 2021 at Johannesburg, South Africa

SRK Consulting - Certified Electronic Signature

srk consulting

566644/44278/Report1

9659-8865-5098-JEFF-25/03/2021

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L Jeffrey Pr.Sci.Nat

CERTIFICATE OF COMPETENT PERSON

As the co-author and co-signatory of the report entitled “Independent Competent Person’s Report on Greenside Colliery”, I hereby state:

1. My name is Norman McGeorge and I am a Principal Mining Engineer with SRK Consulting (South Africa) (Pty) Ltd, with address SRK House, 265 Oxford Road, Illovo, Johannesburg 2196, South Africa.
2. I am a mining engineer and am registered as a professional engineer (PrEng) (Registration number: 20080141) with the Engineering Council of South Africa. I am a Member of the South African Institute of Mining and Metallurgy.
3. I have a BSc (Mining) from the University of the Witwatersrand, South Africa in 1986 and an MSc (Mining) from the University of the Witwatersrand, South Africa in 1990.
4. I have worked as a mining engineer for over 33 years since graduation. I am a full-time employee of SRK Consulting (South Africa) (Pty) Ltd, with the designation Principal Mining Engineer.
5. I am a ‘Competent Person’ as defined in the SAMREC Code.
6. The information in this report that relates to Coal Reserves is based on information compiled by me.
7. I conducted a site visit to Greenside Colliery on 27 November 2019.
8. I am responsible for the reporting of the Coal Reserves for Greenside Colliery as set out in this CPR.
9. I am not aware of any material fact or material change with respect to the subject matter of the CPR that is not reflected in the CPR, the omission of which would make the CPR misleading.
10. I declare that this CPR appropriately reflects my view.
11. I am independent of the Company.
12. I have read the SAMREC Code (2016) and confirm that the CPR has been prepared in accordance with guidelines of the SAMREC Code.
13. I directly hold 1 000 shares in Anglo American plc, which is an immaterial interest in Greenside or the Company (<0.01%). This shareholding has in no way influenced my objective and independent assessment of the Coal Reserves and the compilation of the CPR.
14. At the Effective Date of the CPR, to the best of my knowledge, information and belief, the CPR contains all scientific and technical information that is required to be disclosed to make the report not misleading.

Dated at 25 March 2021 at Johannesburg, South Africa

SRK Consulting - Certified Electronic Signature
srk consulting
566644/44278/Report
710-9685-9784-MCGN-25/03/2021
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N McGeorge PrEng

CERTIFICATE OF COMPETENT VALUATOR

As the co-author and co-signatory of the report entitled “Independent Competent Person’s Report on Greenside Colliery” in support of the proposed listing of the Company, I hereby state:

1. My name is Andrew Tobias van Zyl and I am a Principal Consultant with SRK Consulting (South Africa) (Pty) Ltd, with address SRK House, 265 Oxford Road, Illovo, Johannesburg 2196, South Africa.
2. I am a Fellow of the Southern African Institute of Mining and Metallurgy (SAIMM), membership number 705294.
3. I have a B Eng (Chem) (with Mineral Processing) from the University of Stellenbosch (1999) and an M Com (Financial Economics and Econometrics) from the University of Johannesburg (2006). I have practised in the fields of mining and engineering since 2000 and have been valuing mineral projects since 2007. During the past 8 years, I have valued mining and exploration related projects for some of the major stock exchanges.
4. I have worked in mining and engineering for over 20 years since graduation, across a range of minerals and in both production and project roles. I have worked full time in valuation for more than ten years. I am a full-time employee of SRK Consulting (South Africa) (Pty) Ltd, with designation Principal Consultant.
5. I am a ‘Competent Valuator’ as defined in the SAMVAL Code.
6. The information in this report that relates to valuation is based on information compiled by me.
7. I have personally visited the Mineral Assets of Greenside on 5 December 2019.
8. I place reliance for aspects of the valuation on the following CPs:
    - Techno-economic model auditing, tax and royalty calculations: Vanessa Snyman, CA (SA), who has 24 years’ experience in Corporate and Project Finance with 13 years’ experience advising on coal projects; and
    - Mining and Coal Reserves: Norman McGeorge BSc (Mining) 1986 MSc (Mining) 1990, who is a QP for coal with over 30 year’s appropriate coal experience.
9. I am responsible for the valuation of Greenside Colliery as set out in this CPR.
10. I am not aware of any material fact or material change with respect to the subject matter of the CPR that is not reflected in the CPR, the omission of which would make the CPR misleading.
11. I declare that this CPR appropriately reflects my view.
12. I am independent of the Company.
13. I have read the SAMREC and SAMVAL Codes (2016) and confirm that the CPR has been prepared in accordance with these guidelines.
14. I do not have, nor do I expect to receive, a direct or indirect interest in the Coal Asset or the Company.
15. At the effective date of the CPR, to the best of my knowledge, information and belief, the CPR contains all scientific and technical information that is required to be disclosed to make the report not misleading.

Dated at 25 March 2021 at Johannesburg, South Africa

A van Zyl, FSAIMM

Appendix 4: Compliance Checklist – JSE Listing Rules

Chapter 12 of JSE Listing Rules				Section in the CPR where this is located
Section				**Greenside**
12.9	**(a)**		In addition to the relevant Listings Requirements applicable to pre-listing statements/listings particulars/prospectuses (as per Section 6) or Category 1 circulars (as per Section 9), the following information must be included in such documents where they are required to be prepared by Mineral Companies, and by non-Mineral Companies in respect of substantial mineral assets (i) measured against the purchase or disposal consideration, as the case may be, of the asset in respect of a transaction and (ii) measured against the market capitalisation of the applicant issuer in respect of a new listing:	This report Cover Page, Executive Summary, 1.3.1, 19
			a Competent Person's Report, complying with:	
		(i)	the SAMREC and SAMVAL Codes, (which, for purposes of this requirement, includes the guidelines in italics and Appendices and Tables of the SAMREC and SAMVAL Codes); and	
		(ii)	paragraph 12.10 of this section;	
	(b)		details of any direct or indirect beneficial interest, which each director (and his associates), Competent Person, Competent Valuator and, where applicable, related party (as defined in Section 10), has or, within two years of the date of the pre-listing statement, had:	1.6.3
		(i)	in any asset (including any right to explore for minerals):	
		(1)	of the applicant issuer;	
		(2)	which has been acquired or disposed of by, or leased to or by, the applicant issuer, including any interest in the consideration passing to or from the applicant issuer; and	
		(ii)	in the share capital of the applicant issuer;	
	(c)		financial information in terms of Section 8 of the Listing Requirements to the extent that the applicant issuer has a financial history;	2.5.3
	(d)		a statement by the directors regarding any legal proceedings that may have an influence on the rights to explore or mine, or an appropriate negative statement; and	1.6.2
	(e)		confirmation that the applicant issuer, or its group (including companies in which it has investments), is in possession of the necessary legal title or ownership rights to explore, mine or explore and mine the relevant minerals.	1.6.2, 3.3.3
Competent Person's Report				
12.10			A Competent Person's Report must comply with the SAMREC and SAMVAL Codes and must:	
	(a)		have an effective date (being the date at which the contents of the competent Person's Report are valid) less than six months prior to the date of publication of the pre-listing statement, listing particulars, prospectus or Category 1 circular;	Cover Page, Executive Summary, 1.4, 6.8, 19.1
	(b)		be updated prior to publication of the pre-listing statement, listing particulars, prospectus or Category 1 circular if further material data becomes available after the effective date;	Executive Summary, 1.4.1, 20.18
	(c)		if the Competent Person is not independent of the issuer, clearly disclose the nature of the relationship or interest;	1.6.3
	(d)		show the particular paragraph of this section, the SAMREC Code (including Table 1) and SAMVAL Code (including Appendices and Tables) complied with in the margin of Competent Person's Report;	This table, below section headings, Executive Summary, Appendices
12.10	**(e)**		contain a paragraph stating that all requirements of this section, the SAMREC Code (including Table 1) and SAMVAL Code (including Appendices and Tables) have been complied with, or state that certain clauses in the SAMVAL code were not applicable and provide a list of such clauses; and include a statement detailing:	1.2.2, 1.6.2, 5, 5.1.3
		(i)	exploration expenditure incurred to date by the applicant issuer and by other parties, where available;	
		(ii)	planned exploration expenditure that has been committed, but not yet incurred, by the applicant issuer concerned; and	
		(iii)	planned exploration expenditure that has not been committed to by the applicant issuer but which is expected to be incurred sometime in the future, in sufficient detail to fairly present future expectations;	
	(f)		contain a valuation section which must be completed and signed off by a Competent Valuator in terms of and in compliance with the SAMVAL Code (including Appendices and Tables);	Executive Summary, 19, 22
	(g)		be published in full on the applicant issuer's website;	In full in Circular
	(h)		be included in the relevant JSE document either in full (which includes incorporation by reference pursuant to paragraph 11.61) or as an executive summary. The executive summary must be approved by the JSE (after approval by the Readers Panel) at the same time as the Competent Person's Report is approved by the JSE and the Readers Panel. The executive summary should be a concise summary of the Competent Person's Report and must cover, at a minimum, where applicable:	Set out below
		(i)	purpose;	Executive Summary, 1.1, 1.2.1
		(ii)	project outline;	Executive Summary, 2, 2.1
		(iii)	location map indicating area of interest;	1.1.1, 2, 2.1, Figure 1.2

Chapter 12 of JSE Listing Rules				Section in the CPR where this is located
Section				**Greenside**
		(iv)	legal aspects and tenure, including any disputes, risks or impediments;	Executive Summary, 1.6.2, 3, 3.1, 3.3, 3.4.3
		(v)	geological setting description;	Executive Summary, 4
		(vi)	exploration programme and budget;	5
		(vii)	brief description of individual key modifying factors;	7, 9, 9.2,10
		(viii)	brief description of key environmental issues;	Executive Summary, 14, 15, 16, 16.2
		(ix)	Mineral Resource and Mineral Reserve Statement;	Executive Summary, 6, 8, 9, 9.3, Table 9.2
12.10	**(h)**	**(x)**	reference to risk paragraph in the full Competent Person's Report;	Executive Summary, 9.5, 10.13, 11.7, 12.3, 12.8, 13.1, 15.2.5, 15.3.3, 15.5.4, 16.1.10, 16.2.4, 18.8, 20
		(xi)	statement by the Competent Person that the summary is a true reflection of the full Competent Person's Report; and	Not applicable
		(xii)	summary valuation table. Where the cash flow approach has been employed, the valuation summary must include the discount rate(s) applied to calculate the NPV(s) (net present value(s)) per share with reference to the specific paragraph in the Competent Person's Report. If inferred resources are used, show the summary valuation with and without inclusion of such inferred resources.	Executive Summary, 19
Confirmation by Competent Person				
12.11			If an issuer prepares a circular containing resource and reserve information, the Competent Person must confirm to the JSE in writing that the circular contains no contradictions with the Competent Person's Report, prior to the JSE granting approval of the circular pursuant to the provisions of Section 16.	To be Completed
Announcements				
12.12	**(a)**		In addition to the other requirements under the Listings Requirements, announcements by Mineral Companies and by non-Mineral Companies in respect of substantial mineral assets must comply with the SAMREC Code insofar as they relate or refer to exploration results, Mineral Resources and Mineral Reserves and comply with the SAMVAL Code insofar as it relates to a valuation of mineral assets and announcements must state the name of the Competent Person/Competent Valuator and that the Competent Person/Competent Valuator:	Executive Summary, 1.6.3, 1.6.4
		(i)	has approved the information, in writing, in advance of publication; and	
		(ii)	if the Competent Person/Valuator is not independent of the issuer, clearly disclose the nature of the relationship or interest.	
12.12	**(b)**		The JSE reserves the right to request the detailed information supporting the announced information and submit the same for review by the Readers Panel, at the cost of the applicant issuer concerned, to assess compliance with the SAMREC and SAMVAL Codes. The approval mechanism in this instance is as per paragraph 12.4 above. Any non-compliance with the SAMREC and SAMVAL Codes may result in a restatement and consequent re-publication of the information concerned.	Not applicable

Appendix 5: Compliance Checklist – SAMVAL Code

	SAMVAL Code TABLE 1		Section in the CPR where this is located
Code	**Criteria**	**Comments**	**Greenside**
SV1.0	**General**	The Valuation Report shall contain: The signature of the CV^2; The CV^2's qualifications and experience in valuing mineral properties, or relevant valuation experience; A statement that all facts presented in the report are correct to the best of the CV^2's knowledge; A statement that the analyses and conclusions are limited only by the reported forecasts and conditions; A statement of the CV^2's present or prospective interest in the subject property or asset; A statement that the CV^2's compensation, employment, or contractual relationship with the Commissioning Entity is not contingent on any aspect of the Report; A statement that the CV^2 has no bias with respect to the assets that are the subject of the Report, or to the parties involved with the assignment; A statement that the CV^2 has (or has not) made a personal inspection of the property; and A record of the CP's and experts who have contributed to the valuation. Written consent to use and rely on such Reports shall be obtained. Significant contributions made by such experts shall be highlighted individually.	ES31, 1.2.2, 1.3.2, 1.5, 1.6.3, 1.6.4, 1.8, Table 1.1
SV1.1	**Illustrations**	There are numerous instances (especially in the non-listed environment) when a valuation is not accompanied by the CPR on which it is based. In these cases, especially, diagrams/illustrations are required and shall be in the required format. Diagrams, maps, plans, sections, and illustrations shall be legible and prepared at an appropriate scale to distinguish important features. Maps shall be dated and include a legend, author or information source, coordinate system and datum, a scale in bar or grid form, and an arrow indicating north. A location or index map and more detailed maps showing all important features described in the text, including all relevant cadastral and other infrastructure features, shall be included.	Not applicable
SV1.2	**Synopsis**	Provide the salient features of the report – a brief description of the terms of reference, scope of work, the Valuation Date, the mineral property; its location, ownership, geology, and mineralization; history of exploration and production, current status, Exploration Targets, mineralization and/or production forecast, Mineral Resources and Mineral Reserves, production facilities (if any); environmental, social, legal, and permitting considerations; valuation approaches and methods, valuation, and conclusions.	Cover Page, Executive Summary, 1.1.1, 1.2, 1.4, 2.6.1, 3.4.3, 9, 15, 19, 21
SV1.3	**Introduction and Scope**	Introduction and scope, specifying commissioning instructions including reference to the valuation, engagement letter, date, purpose and intended use of the valuation. The CV^2 shall fully disclose any interests in the Mineral Asset or Commissioning Entity. Any restrictions on scope and special instructions followed by the CV^2, and how these affect the reliability of the valuation, shall be disclosed.	1.1, 1.2
SV1.4	**Compliance**	A statement that the report complies with SAMVAL shall be included. Any variations shall be described and discussed.	1.1, 1.2.2, 19
SV1.5	**Identity, Tenure and Infrastructure**	The identity, tenure, associated infrastructure and locations of the property interests, rights or securities to be valued (*i.e.* the physical, legal, and economic characteristics of the property) shall be disclosed.	ES3, ES4, 1.1, 2.1, 3, 3.1, 3.3, 12
SV1.6	**History**	History of activities, results, and operations to date shall be included.	ES9, ES12, 2.5, 6.9, 9.4
SV1.7	**Geological Setting**	Geological setting, models, and mineralization shall be described.	ES5, 4, 19
SV1.8	**Exploration Results and Exploration Targets**	Exploration programmes, their location, results, interpretation, and significance shall be described. Exploration Targets shall be discussed.	ES6, 5, 5.1
SV1.9	**Mineral Resources and Mineral Reserves**	Mineral Resource and Mineral Reserve statements shall be provided. They shall be signed off by a Competent Person in compliance with the SAMREC Code or another CRIRSCO code. The CV^2 shall set out the manner in which he has satisfied himself that he can rely upon the information in the CPR.	ES8, ES14, 6.8, 9, 19
SV1.10	**Modifying Factors and Key Assumptions**	A statement of Modifying Factors shall be included, separately summarizing material issues relating to each applicable Modifying Factor. The CV^2 shall set out the manner in which he has satisfied himself that he can rely upon the technical information provided. (**NOTE:** All the Modifying Factors shall be listed, or references provided to relevant definitions). This shall include an explanation of all material assumptions and limiting factors. When reporting on environmental, social and governance modifying factors, reference should be made to the ESG reporting parameters as required SAMESG or other recognised code, e.g. Equator Principles.	ES11, ES13, ES31, 1.6.1, 9, 9.2, 19.1.2
SV1.11	**Previous Valuations**	The valuation shall refer to all available and relevant previous valuations of the Mineral Asset that have been performed in at least the previous two years, and explain any material differences between these and the present valuation.	ES26, 19, 19.5
SV1.12	**Valuation Approaches and Methods**	The valuation approaches and methods used in the valuation shall be described and justified in full.	ES25, ES27, 19, 19.1, 19.2, 19.6
SV1.13	**Valuation Date**	A statement detailing the Report Date and the Valuation Date, as defined in this Code, and whether any material changes have occurred between the Valuation Date and the Report Date.	ES3, ES21, ES24, ES27, ES28, ES31, 1.4, 1.4.1, 19, 20.18
SV1.14	**Valuation Results**	For the Income Approach, the valuation cash flow shall be disclosed. For the Market Approach, the market comparable information shall be disclosed. For the Cost Approach, the relevant and applicable cost shall be disclosed.	ES23, ES25, ES27, 17, 19, 19.2, 19.6

	SAMVAL Code TABLE 1		Section in the CPR where this is located
Code	**Criteria**	**Comments**	**Greenside**
SV1.15	**Valuation Summary and Conclusions**	A summary of the valuation details, consolidated into single material line items, shall be provided. The Mineral Asset Valuation shall specify the key risks and forecasts used in the valuation. A cautionary statement concerning all forward-looking or forecast statements shall be included. The valuation's conclusions, illustrating a range of values, the best estimate value for each valuation, and whether the conclusions are qualified or subject to any restrictions imposed on the CV^2, shall be included.	ES27, 1.6.5, 19, 19.6, 19.8, 20.17
SV1.16	**Identifiable Component Asset (ICA) Values**	In some valuations, the valuation shall be broken down into Identifiable Component Asset Values (an ICA valuation) equaling the Mineral Asset Value. This could be, for example, due to the requirements of other valuation rules and legislative practices including taxation (*i.e.* fixed property, plant, and equipment relative to Mineral Asset Value allocations such as in recoupment or capital gains tax calculations or where a commissioned Mineral Asset Valuation specifies a need for a breakdown of the Mineral Asset Valuation). In such cases, the separate allocations of value shall be made by taking account of the value of every separately identifiable component asset. Allocation of value to only some, and not all, identifiable component assets is not allowed. This requires a specialist appraisal of each identifiable component asset of property, plant and equipment, with the 'remaining' value of the Mineral Asset being attributed to the Mineral Resources and Reserves. Such valuations shall be performed by suitably qualified experts, who may include the CV^2. If the Mineral Asset Valuation includes an ICA Valuation, the CV^2 shall satisfy himself or herself that the ICA Valuation is reasonable before signing off the Mineral Asset Valuation.	Not applicable
SV1.17	**Historic Verification**	A historic verification of the performance parameters on which the Mineral Asset Valuation is based shall be presented.	19
SV1.18	**Market Assessment**	A comprehensive market assessment should be presented.	19, 19.3
SV1.19	**Sources of Information**	The sources of all material information and data used in the report shall be disclosed, as well as references to any published or unpublished technical papers used in the valuation, subject to confidentiality. A reference shall be made to any other report that has been compiled, for the purpose of providing information for the valuation, including SAMREC-compliant reports and any other contributions or reports from experts.	1.2.3, 19

Appendix 6: Compliance Checklist – SAMREC Code

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	**Mineral Resources**	**Mineral Reserves**	**Greenside**
Section 1: Project Outline						
SR 1.1	**Property Description**	**(i)**	Brief description of the scope of project (i.e. whether in preliminary sampling, advanced exploration, scoping, pre-feasibility, or feasibility phase, LoM plan for an ongoing mining operation or closure).			ES1, ES3, 1.1
		(ii)	Describe (noting any conditions that may affect possible prospecting/mining activities) topography, elevation, drainage, fauna and flora, the means and ease of access to the property, the proximity of the property to a population centre, and the nature of transport, the climate, known associated climatic risks and the length of the operating season and to the extent relevant to the mineral project, the sufficiency of surface rights for mining operations including the availability and sources of power, water, mining personnel, potential tailings storage areas, potential waste disposal areas, heap leach pad areas, and potential processing plant sites.			ES17, 2.4, 3.3.3, 8.5, 11, 12, 12.3
		(iii)	Specify the details of the personal inspection on the property by each CP or, if applicable, the reason why a personal inspection has not been completed.			1.9
SR 1.2	**Location**	**(i)**	Description of location and map (country, province, and closest town/city, coordinate systems and ranges, etc.).			ES3, 2, 2.1, 2.2
		(ii)	Country Profile: describe information pertaining to the project host country that is pertinent to the project, including relevant applicable legislation, environmental and social context etc. Assess, at a high level, relevant technical, environmental, social, economic, political and other key risks.			2.6.1, 2.6.2, 3.4.2
		(iii)	Provide a general topocadastral map.	Provide a Topo-cadastral map in sufficient detail to support the assessment of eventual economics. State the known associated climatic risks.	Provide a detailed topo-cadastral map. Confirm that applicable aerial surveys have been checked with ground controls and surveys, particularly in areas of rugged terrain, dense vegetation or high altitude.	2.6.1, 2.6.2, 3.3.1 (Figs. 3-1 and 3-2)
SR 1.3	**Adjacent Properties**	**(i)**	Discuss details of relevant adjacent properties If adjacent or nearby properties have an important bearing on the report, then their location and common mineralized structures should be included on the maps. Reference all information used from other sources.			2.3
SR 1.4	**History**	**(i)**	State historical background to the project and adjacent areas concerned, including known results of previous exploration and mining activities (type, amount, quantity and development work), previous ownership and changes thereto.			2.5.1, 2.5.2, 2.5.3
		(ii)	Present details of previous successes or failures with reasons why the project may now be considered potentially economic.			2.5.1, 2.5.2
		(iii)		Discuss known or existing historical Mineral Resource estimates and performance statistics on actual production for past and current operations.		ES8, ES9, ES12, ES15, 2.5.3, 6.8, 6.9
		(iv)			Discuss known or existing historical Mineral Reserve estimates and performance statistics on actual production for past and current operations.	ES15, 2.5.3, 9.3.3, 9.4
SR 1.5	**Legal Aspects and Permitting**		Confirm the legal tenure to the satisfaction of the CP, including a description of the following:			
		(i)	Discuss the nature of the issuer's rights (e.g. prospecting and/or mining) and the right to use the surface of the properties to which these rights relate. Disclose the date of expiry and other relevant details.			ES4, 1.1.1, 2.6.1, 3, 3.1, 3.3
		(ii)	Present the principal terms and conditions of all existing agreements, and details of those still to be obtained, (such as, but not limited to, concessions, partnerships, joint ventures, access rights, leases, historical and cultural sites, wilderness or national park and environmental settings, royalties, consents, permission, permits or authorisations).			1.1.1, 3, 3.4.1, 3.4.2, 15.1
		(iii)	Present the security of the tenure held at the time of reporting or that is reasonably expected to be granted in the future along with any known impediments to obtaining the right to operate in the area. State details of applications that have been made.			3, 3.1, 3.2, 3.3
		(iv)	Provide a statement of any legal proceedings for example; land claims, that may have an influence on the rights to prospect or mine for minerals, or an appropriate negative statement.			3, 3.4.2, 3.4.3
		(v)	Provide a statement relating to governmental/statutory requirements and permits as may be required, have been applied for, approved or can be reasonably be expected to be obtained.			3, 3.4.1, 3.4.2, 15.1, 15.5.2
SR 1.6	**Royalties**	**(i)**	Describe the royalties that are payable in respect of each property.			3.1.4, 3.1.5, 19.2.1
SR 1.7	**Liabilities**	**(i)**	Describe any liabilities, including rehabilitation guarantees that are pertinent to the project. Provide a description of the rehabilitation liability, including, but not limited to, legislative requirements, assumptions and limitations.			ES21, 1.4.3, 1.6.1, 15.5, 15.5.2, 15.5.3
Section 2: Geological Setting, Deposit, Mineralisation						
SR 2.1	**Geological Setting, Deposit, Mineralisation**	**(i)**	Describe the regional geology.			ES5, 4, 4.1
		(ii)	Describe the project geology including deposit type, geological setting and style of mineralisation.			ES5, 4, 4.3
		(iii)	Discuss the geological model or concepts being applied in the investigation and on the basis of which the exploration program is planned. Describe the inferences made from this model.			4, 4.3, 5, 5.1, 6.2

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Greenside
		(iv)	Discuss data density, distribution and reliability and whether the quality and quantity of information are sufficient to support statements, made or inferred, concerning the Exploration Target or Mineralisation.			4, 4.3, 5.6
		(v)	Discuss the significant minerals present in the deposit, their frequency, size and other characteristics. Includes minor and gangue minerals where these will have an effect on the processing steps. Indicate the variability of each important mineral within the deposit.			ES5, 4, 6.3.1
		(vi)	Describe the significant mineralised zones encountered on the property, including a summary of the surrounding rock types, relevant geological controls, and the length, width, depth, and continuity of the mineralisation, together with a description of the type, character, and distribution of the mineralisation.			ES5, 4, 6.3.1
		(vii)	Confirm that reliable geological models and / or maps and cross sections that support interpretations exist.			ES5, ES7, 4, 6.3
Section 3: Exploration and Drilling, Sampling Techniques and Data						
SR 3.1	Exploration	(i)	Describe the data acquisition or exploration techniques and the nature, level of detail, and confidence in the geological data used (i.e. geological observations, remote sensing results, stratigraphy, lithology, structure, alteration, mineralisation, hydrology, geophysical, geochemical, petrography, mineralogy, geochronology, bulk density, potential deleterious or contaminating substances, geotechnical and rock characteristics, moisture content, bulk samples etc.). Confirm that data sets include all relevant metadata, such as unique sample number, sample mass, collection date, spatial location etc.			ES6, ES10, ES22, 5, 5.1, 5.5, 7, 16, 16.1
		(ii)	Identify and comment on the primary data elements (observation and measurements) used for the project and describe the management and verification of these data or the database. This should describe the following relevant processes: acquisition (capture or transfer), validation, integration, control, storage, retrieval and backup processes. It is assumed that data are stored digitally but hand-printed tables with well-organized data and information may also constitute a database.			1.5, 5, 5.1
		(iii)	Acknowledge and appraise data from other parties and reference all data and information used from other sources.			5, 5.1
		(iv)	Clearly distinguish between data / information from the property under discussion and that derived from surrounding properties.			5, 5.1
		(v)	Describe the survey methods, techniques and expected accuracies of data. Specify the grid system used.			5, 5.2.4
		(vi)	Discuss whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the estimation procedure(s) and classifications applied.			5, 5.1
		(vii)	Present representative models and / or maps and cross sections or other two or three-dimensional illustrations of results, showing location of samples, accurate drill-hole collar positions, down-hole surveys, exploration pits, underground workings, relevant geological data, etc.			4, 5, 6.3.1
		(viii)	Report the relationships between mineralisation widths and intercept lengths are particularly important, the geometry of the mineralisation with respect to the drill hole angle. If it is not known and only the down-hole lengths are reported, confirm it with a clear statement to this effect (e.g. 'down-hole length, true width not known').			5, 5.1
SR 3.2	Drilling Techniques	(i)	Present the type of drilling undertaken (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Banka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).			ES6, 5.2, 5.2.6
		(ii)	Describe whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, technical studies, mining studies and metallurgical studies.			ES6, 5, 5.6
		(iii)	Describe whether logging is qualitative or quantitative in nature; indicate if core photography. (or costean, channel, etc.) was undertaken.			ES6, 5, 5.2.5
		(iv)	Present the total length and percentage of the relevant intersections logged.			ES6, 5, 5.2.5
		(v)	Results of any downhole surveys of the drill hole to be discussed.			ES6, 5, 5.2.6
SR 3.3	Sample method, collection, capture and storage	(i)	Describe the nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.			5.3.2, 5.6
		(ii)	Describe the sampling processes, including sub-sampling stages to maximize representivity of samples. This should include whether sample sizes are appropriate to the grain size of the material being sampled. Indicate whether sample compositing has been applied.			5.3.2, 5.6
		(iii)	Appropriately describe each data set (e.g. geology, grade, density, quality, diamond breakage, geo-metallurgical characteristics etc.), sample type, sample-size selection and collection methods.			5.5, 5.6
		(iv)	Report the geometry of the mineralisation with respect to the drill-hole angle. State whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. State if the intersection angle is not known and only the downhole lengths are reported.			5.3.2, 5.6
		(v)	Describe retention policy and storage of physical samples (e.g. core, sample reject, etc.).			5.3.2, 5.6
		(vi)	Describe the method of recording and assessing core and chip sample recoveries and results assessed, measures taken to maximise sample recovery and ensure representative nature of the samples and whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.			5.3.2, 5.6

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Greenside
		(vii)	If a drill-core sample is taken, state whether it was split or sawn and whether quarter, half or full core was submitted for analysis. If a non-core sample, state whether the sample was riffled, tube sampled, rotary split etc. and whether it was sampled wet or dry.			5.3.2, 5.6
SR 3.4	Sample Preparation and Analysis	(i)	Identify the laboratory(s) and state the accreditation status and Registration Number of the laboratory or provide a statement that the laboratories are not accredited.			5.3.3
		(ii)	Identify the analytical method. Discuss the nature, quality and appropriateness of the assaying and laboratory processes and procedures used and whether the technique is considered partial or total.			5.3.3
		(iii)	Describe the process and method used for sample preparation, sub-sampling and size reduction, and likelihood of inadequate or non-representative samples (i.e. improper size reduction, contamination, screen sizes, granulometry, mass balance, etc.).			5.3.3
SR 3.5	Sampling Governance	(i)	Discuss the governance of the sampling campaign and process, to ensure quality and representivity of samples and data, such as sample recovery, high grading, selective losses or contamination, core/hole diameter, internal and external QA/QC, and any other factors that may have resulted in or identified sample bias.			5.3.1, 5.4
		(ii)	Describe the measures taken to ensure sample security and the Chain of Custody.			5.3.1
		(iii)	Describe the validation procedures used to ensure the integrity of the data, e.g. transcription, input or other errors, between its initial collection and its future use for modelling (e.g. geology, grade, density, etc.).			5.3.1, 5.4, 5.5
		(iv)	Describe the audit process and frequency (including dates of these audits) and disclose any material risks identified.			5.3.1
SR 3.6	Quality Control/Quality Assurance	(i)	Demonstrate that adequate field sampling process verification techniques (QA/QC) have been applied, e.g. the level of duplicates, blanks, reference material standards, process audits, analysis, etc. If indirect methods of measurement were used (e.g. geophysical methods), these should be described, with attention given to the confidence of interpretation.			5.4
SR 3.7	Bulk Density	(i)	Describe the method of bulk density determination with reference to the frequency of measurements, the size, nature and representativeness of the samples.			5.5
		(ii)	If target tonnage ranges are reported, state the preliminary estimates or basis of assumptions made for bulk density.			Not applicable
		(iii)	Discuss the representivity of bulk density samples of the material for which a grade range is reported.			?
		(iv)	Discuss the adequacy of the methods of bulk density determination for bulk material with special reference to accounting for void spaces (vugs, porosity etc.), moisture and differences between rock and alteration zones within the deposit.			5.5
SR 3.8	Bulk-Sampling and/or trial-mining	(i)	Indicate the location of individual samples (including map).			Not applicable
		(ii)	Describe the size of samples, spacing/density of samples recovered and whether sample sizes and distribution are appropriate to the grain size of the material being sampled.			Not applicable
		(iii)	Describe the method of mining and treatment.			Not applicable
		(iv)	Indicate the degree to which the samples are representative of the various types and styles of mineralisation and the mineral deposit as a whole.			Not applicable
Section 4: Estimation and Reporting of Exploration Results and Mineral Resources						
SR 4.1	Geological model and interpretation	(i)	Describe the geological model, construction technique and assumptions that forms the basis for the Exploration Results or Mineral Resource estimate. Discuss the sufficiency of data density to assure continuity of mineralisation and geology and provide an adequate basis for the estimation and classification procedures applied.			6.2, 6.3.1
		(ii)	Describe the nature, detail and reliability of geological information with which lithological, structural, mineralogical, alteration or other geological, geotechnical and geo-metallurgical characteristics were recorded.			ES7, ES10, 6.2, 6.3, 7
		(iii)	Describe any obvious geological, mining, metallurgical, environmental, social, infrastructural, legal and economic factors that could have a significant effect on the prospects of any possible exploration target or deposit.			6.3
		(iv)		Discuss all known geological data that could materially influence the estimated quantity and quality of the Mineral Resource.		ES7, ES8, ES28, 1.4.1, 6.3, 6.4, 6.8, 20.18
		(v)		Discuss whether consideration was given to alternative interpretations or models and their possible effect (or potential risk) if any, on the Mineral Resource estimate.		ES7, 6.3
		(vi)		Discuss geological discounts (e.g. magnitude, per reef, domain, etc.), applied in the model, whether applied to mineralized and / or un-mineralized material (e.g. potholes, faults, dykes, etc.).		6.7

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	**Mineral Resources**	**Mineral Reserves**	**Greenside**
SR 4.2	**Estimation and modelling techniques**	**(i)**	Describe in detail the estimation techniques and assumptions used to determine the grade and tonnage ranges.			6.7
		(ii)		Discuss the nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values (cutting or capping), compositing (including by length and/or density), domaining, sample spacing, estimation unit size (block size), selective mining units, interpolation parameters and maximum distance of extrapolation from data points.		ES11, ES14, 6.4, 6.7, 9, 9.1.1, 9.1.2
		(iii)		Describe assumptions and justification of correlations made between variables.		6.4
		(iv)		Provide details of any relevant specialized computer program (software) used, with the version number, together with the estimation parameters used.		6.2, 6.4, 8.2, 9.1.2
		(v)		State the processes of checking and validation, the comparison of model information to sample data and use of reconciliation data, and whether the Mineral Resource estimate takes account of such information.		ES9, ES15, 6.3
		(vi)		Describe the assumptions made regarding the estimation of any co-products, by-products or deleterious elements.		6.7
SR 4.3	**Reasonable prospects for eventual economic extraction**	**(i)**		Disclose and discuss the geological parameters. These would include (but not be limited to) volume / tonnage, grade and value / quality estimates, cut-off grades, strip ratios, upper- and lower- screen sizes.		6.4
		(ii)		Disclose and discuss the engineering parameters. These would include mining method, dilution, processing, geotechnical, geohydraulic and metallurgical) parameters.		Executive Summary (ES10, ES11, ES16, ES18, ES20, ES22), 6.4, 7, 8, 8.3, 9.1.2, 10, 12, 16
		(iii)		Disclose and discuss the infrastructural including, but not limited to, power, water, site-access.		6.4, 12.3
		(iv)		Disclose and discuss the legal, governmental, permitting, statutory parameters.		6.4
		(v)		Disclose and discuss the environmental and social (or community) parameters.		6.4, 15.3
		(vi)		Disclose and discuss the marketing parameters.		6.4, 12.7, 17
		(vii)		Disclose and discuss the economic assumptions and parameters. These factors will include, but not limited to, commodity prices and potential capital and operating costs.		6.4, 8.7, 12.7
		(viii)		Discuss any material risks.		ES27, 6.4, 1.4.1, 21.18
		(ix)		Discuss the parameters used to support the concept of "eventual".		6.4
SR 4.4	**Classification Criteria**	**(i)**		Describe criteria and methods used as the basis for the classification of the Mineral Resources into varying confidence categories.		6.5
SR 4.5	**Reporting**	**(i)**	Discuss the reported low and high-grades and widths together with their spatial location to avoid misleading the reporting of Exploration Results, Mineral Resources or Mineral Reserves.			ES14, 9
		(ii)	Discuss whether the reported grades are regional averages or if they are selected individual samples taken from the property under discussion.			ES8, 6.8
		(iii)	State assumptions regarding mining methods, infrastructure, metallurgy, environmental and social parameters. State and discuss where no mining related assumptions have been made.			9, 9.1.1, 9.1.2
		(iv)	State the specific quantities and grades / qualities which are being reported in ranges and/or widths and explain the basis of the reporting.			ES8, 6.8

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Greenside
		(v)		Present the detail for example open pit, underground, residue stockpile, remnants, tailings, and existing pillars or other sources in the Mineral Resource statement.		ES8, 6.8
		(vi)		Present a reconciliation with any previous Mineral Resource estimates. Where appropriate, report and comment on any historic trends (e.g. global bias).		ES9, ES15, 6.9, 9.4, 17
		(vii)		Present the defined reference point for the tonnages and grades reported as Mineral Resources. State the reference point if the point is where the run of mine material is delivered to the processing plant. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.		ES8, 6.8
		(viii)	If the CP is relying on a report, opinion, or statement of another expert who is not a CP, disclose the date, title, and author of the report, opinion, or statement, the qualifications of the other expert and why it is reasonable for the CP to rely on the other expert, any significant risks and any steps the CP took to verify the information provided.			Not applicable
		(ix)	State the basis of equivalent metal formulae, if applied.			Not applicable
Section 5: Technical Studies						
SR 5.1	Introduction	(i)	Technical Studies are not applicable to Exploration Results.	State the level of study – whether scoping, prefeasibility, feasibility or ongoing LoM.	State the level of study – whether prefeasibility, feasibility or ongoing LoM. The Code requires that a study to at least a Pre-Feasibility level has been undertaken to convert Mineral Resource to Mineral Reserve. Such studies will have been carried out and will include a mine plan or production schedule that is technically achievable and economically viable, and that all Modifying Factors have been considered.	ES13, ES14, 8.7, 9, 9.2
		(ii)			Provide a summary table of the Modifying Factors used to convert the Mineral Resource to Mineral Reserve for Pre-feasibility, Feasibility or on-going LoM studies.	ES13, 9, 9.2
SR 5.2	Mining Design	(i)	Technical Studies are not applicable to Exploration Results.	State assumptions regarding mining methods and parameters when estimating Mineral Resources or explain where no mining assumptions have been made.		ES11, 8, 8.2, 8.7
		(ii)			State and justify all modifying factors and assumptions made regarding mining methods, minimum mining dimensions (or pit shell) and internal and, if applicable, external) mining dilution and mining losses used for the techno-economic study and signed-off, such as mining method, mine design criteria, infrastructure, capacities, production schedule, mining efficiencies, grade control, geotechnical and hydrological considerations, closure plans, and personnel requirements.	ES10, ES21, ES22, 7, 8, 8.2, 8.6, 8.7, 15.5, 16.1
		(iii)			State what mineral resource models have been used in the study.	6.2, 8
		(iv)			Explain the basis of (the adopted) cut-off grade(s) or quality parameters applied. Include metal equivalents if relevant.	ES11, 8, 8.2
		(v)			Description and justification of mining method(s) to be used.	8, 8.2
		(vi)			For open-pit mines, include a discussion of pit slopes, slope stability, and strip ratio.	7.4, 7.5, 8, 8.2
		(vii)			For underground mines, discussion of mining method, geotechnical considerations, mine design characteristics, and ventilation/cooling requirements.	ES11, ES22, 8
		(viii)			Discussion of mining rate, equipment selected, grade control methods, geotechnical and hydrogeological considerations, health and safety of the workforce, staffing requirements, dilution, and recovery.	ES10, ES11, ES19, ES20, ES22, 7, 8, 8.1, 8.2, 8.3, 8.5, 10, 10.1, 10.6, 14, 16, 16.2

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Greenside
		(ix)			State the optimisation methods used in planning, list of constraints (practicality, plant, access, exposed Mineral Reserves, stripped Mineral Reserves, bottlenecks, draw control).	ES14, 8, 8.2, 9
SR 5.3	Metallurgical and Testwork	(i)	Technical Studies are not applicable to Exploration Results.		Discuss the source of the sample and the techniques to obtain the sample, laboratory and metallurgical testing techniques.	5.2, 5.3.3, 10
		(ii)			Explain the basis for assumptions or predictions regarding metallurgical amenability and any preliminary mineralogical test work already carried out.	10
		(iii)		Discuss the possible processing methods and any processing factors that could have a material effect on the likelihood of eventual economic extraction. Discuss the appropriateness of the processing methods to the style of mineralisation.	Describe and justify the processing method(s) to be used, equipment, plant capacity, efficiencies, and personnel requirements.	ES16, ES28, 10, 10.1, 10.6
		(iv)			Discuss the nature, amount and representativeness of metallurgical test work undertaken and the recovery factors used. A detailed flow sheet / diagram and a mass balance should exist, especially for multi-product operations from which the saleable materials are priced for different chemical and physical characteristics.	10, 10.1
		(v)			State what assumptions or allowances have been made for deleterious elements and the existence of any bulk-sample or pilot-scale test work and the degree to which such samples are representative of the ore body as a whole.	10
		(vi)			State whether the metallurgical process is well-tested technology or novel in nature.	10, 10.2
SR 5.4	Infrastructure	(i)	Technical Studies are not applicable to Exploration Results.	Comment regarding the current state of infrastructure or the ease with which the infrastructure can be provided or accessed.		ES18, 2.4, 2.4.2, 12
		(ii)			Report in sufficient detail to demonstrate that the necessary facilities have been allowed for (which may include, but not be limited to, processing plant, tailings dam, leaching facilities, waste dumps, road, rail or port facilities, water and power supply, offices, housing, security, resource sterilisation testing etc.). Provide detailed maps showing locations of facilities.	ES17, ES18, 2.4, 2.4.2, 11, 12, 12.3
		(iii)			Statement showing that all necessary logistics have been considered.	10.1, 13
SR 5.5	Environmental and Social	(i)	Technical Studies are not applicable to Exploration Results.	Confirm that the company holding the tenement has addressed the host country environmental legal compliance requirements and any mandatory and/or voluntary standards or guidelines to which it subscribes.		ES20, 2.6.1, 2.6.2, 3.4.1, 15, 15.2.2
		(ii)		Identify the necessary permits that will be required and their status and where not yet obtained, confirm that there is a reasonable basis to believe that all permits required for the project will be obtained.		ES20, 3.4.1, 15, 15.1
		(iii)		Identify and discuss any sensitive areas that may affect the project as well as any other environmental factors including I&AP and/or studies that could have a material effect on the likelihood of eventual economic extraction. Discuss possible means of mitigation.		ES28, 1.4.1, 2.6.1, 2.6.2, 3.4.1, 15, 15.1, 21.18
		(iv)		Identify any legislated social management programmes that may be required and discuss the content and status of these.		ES20, 15.3
		(v)		Outline and quantify the material socio-economic and cultural impacts that need to be mitigated, and ~~their~~ mitigation measures and where appropriate the associated costs.		2.6.2, 15.3
SR 5.6	Market Studies and Economic criteria	(i)	Technical Studies are not applicable to Exploration Results.		Describe the valuable and potentially valuable product(s) including suitability of products, co-products and by products to market.	17, 18
		(ii)			Describe product to be sold, customer specifications, testing, and acceptance requirements. Discuss whether there exists a ready market for the product and whether contracts for the sale of the product are in place or expected to be readily obtained. Present price and volume forecasts and the basis for the forecast.	ES23, ES24, 10.1.1, 17, 18

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Greenside
		(iii)			State and describe all economic criteria that have been used for the study such as capital and operating costs, exchange rates, revenue / price curves, royalties, cut-off grades, reserve pay limits.	6.4, 8.6, 12.7.1, 12.7.2, 19
		(iv)			Summary description, source and confidence of method used to estimate the commodity price/value profiles used for cut-off grade calculation, economic analysis and project valuation, including applicable taxes, inflation indices, discount rate and exchange rates.	6.4, 19, 19.2
		(v)			Present the details of the point of reference for the tonnages and grades reported as Mineral Reserves (e.g. material delivered to the processing facility or saleable product(s)). It is important that, in any situation where the reference point is different, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.	ES14, 9
		(vi)			Justify assumptions made concerning production cost including transportation, treatment, penalties, exchange rates, marketing and other costs. Provide details of allowances that are made for the content of deleterious elements and the cost of penalties.	ES24, 17, 18
		(vii)			Provide details of allowances made for royalties payable, both to Government and private.	3.1.5
		(viii)			State type, extent and condition of plant and equipment that is significant to the existing operation(s).	ES18, 12
		(ix)			Provide details of all environmental, social and labour costs considered.	8.6, 15.5.3
SR 5.7	Risk Analysis	(i)	Technical Studies are not applicable to Exploration Results.	Report an assessment of technical, environmental, social, economic, political and other key risks to the project. Describe actions that will be taken to mitigate and/or manage the identified risks.		ES29, 9.5, 10.13, 11.7, 12.8, 13.1, 14.4, 15.2.5, 15.3.3, 15.5.4, 16.1.10, 16.2.4, 18.8, 20, 21
SR 5.8	Economic Analysis	(i)	Technical Studies are not applicable to Exploration Results.	At the relevant level (Scoping Study, Pre-feasibility, Feasibility or on-going LoM), provide an economic analysis for the project that includes:		ES27, 19, 19.6
		(ii)		Cash Flow forecast on an annual basis using Mineral Reserves or an annual production schedule for the life of the project.		19, 19.2
		(iii)		A discussion of net present value (NPV), internal rate of return (IRR) and payback period of capital.		19, 19.2
		(iv)		Sensitivity or other analysis using variants in commodity price, grade, capital and operating costs, or other significant parameters, as appropriate and discuss the impact of the results.		19, 19.2
Section 6: Estimation and Reporting of Mineral Reserves						
SR 6.1	Estimation and modelling techniques	(i)		Describe the Mineral Resource estimate used as a basis for the conversion to a Mineral Reserve.		ES8, 6.8, 9, 9.1.1, 9.1.2
		(ii)		Report the Mineral Reserve Statement with sufficient detail indicating if the mining is open pit or underground plus the source and type of mineralisation, domain or ore body, surface dumps, stockpiles and all other sources.		ES11, 8, 9, 9.3, 9.3.3
		(iii)			Provide a reconciliation reporting historic reliability of the performance parameters, assumptions and modifying factors including a comparison with the previous Reserve quantity and qualities, if available. Where appropriate, report and comment on any historic trends (e.g. global bias).	ES9, ES13, ES15, 9, 9.1.1, 9.2
SR 6.2	Classification Criteria	(i)			Describe and justify criteria and methods used as the basis for the classification of the Mineral Reserves into varying confidence categories, based on the Mineral Resource category, and including consideration of the confidence in all the modifying factors.	ES13, 9, 9.2, 9.3.1
SR 6.3	Reporting	(i)			Discuss the proportion of Probable Mineral Reserves, which have been derived from Measured Mineral Resources (if any), including the reason(s) therefore.	ES14, 9, 9.3.3
		(ii)			Present details of for example open pit, underground, residue stockpile, remnants, tailings, and existing pillars or other sources in respect of the Mineral Reserve statement.	ES14, 9.3, 9.3.3

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	**Mineral Resources**	**Mineral Reserves**	**Greenside**
		(iii)			Present the details of the defined reference point for the Mineral Reserves. State where the reference point is the point where the run of mine material is delivered to the processing plant. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported. State clearly whether the tonnages and grades reported for Mineral Reserves are in respect of material delivered to the plant or after recovery.	10.1, 10.2, 10.7
		(iv)			Present a reconciliation with the previous Mineral Reserve estimates. Where appropriate, report and comment on any historic trends (e.g. global bias).	ES9, 9.4
		(v)			Only Measured and Indicated Mineral Resources can be considered for inclusion in the Mineral Reserve.	9.3.3
		(vi)			State whether the Mineral Resources are inclusive or exclusive of Mineral Reserves.	ES8, 6.8, 9, 9.4
Section 7: Audits and Reviews						
SR 7.1	**Audits and Reviews**	**(i)**	State type of review/audit (e.g. independent, external), area (e.g. laboratory, drilling, data, environmental compliance etc.), date and name of the reviewer(s) together with their recognized professional qualifications.			1.1, 2.6.2, 3.4.2, 6.3, 15.2.2, 15.2.4, 15.3.1, 16.1.5
		(ii)	Disclose the conclusions of relevant audits or reviews. Note where significant deficiencies and remedial actions are required.			ES30, ES31, 2.6.2, 3.4.2, 6.3, 15.2.2, 15.2.4, 15.3.1, 16.1.5, 21
Section 8: Other Relevant Information						
SR 8.1		**(i)**	Discuss all other relevant and material information not discussed elsewhere.			Not applicable
Section 9: Qualification of CP(s) and other key technical staff. Date and Signature Page						
SR 9.1		**(i)**	State the full name, registration number and name of the professional body or RPO, for all the CP(s). State the relevant experience of the CP(s) and other key technical staff who prepared and are responsible for the Public Report.			1.3.2, 1.8, 22
		(ii)	State the CP's relationship to the issuer of the report.			1.8, 22
		(iii)	Provide the Certificate of the CP (Appendix 2), including the date of sign-off and the effective date, in the Public Report.			Cover Page, ES3, 1.4, Appendix 3

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