XMP Consulting CC

SAMPLE

REVIEW of Coal Resources

ANONYMYSED

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EXECUTIVE SUMMARY

Operating a surface mining operation near the town of XX and the boundary between the XX and XX coalfield, the Client requested that XMP study the coal assets under their control. They are currently extracting coal from an area (henceforth anonymised as Area 1) with approximately 50% of the resource already exploited, consequently, production can only be maintained if a new mining area is developed timeously. The new planned mining areas are Area 2 and Area 2A. They will primarily recover coal pillars from a defunct underground mine with limited access to unmined surface areas. Various past studies were conducted on these coal assets. The studies were based on reports and investigations that were compiled some years ago without being updated. The Client requests a consolidated review of their coal assets to ensure security of supply to the existing market or new and/or alternative markets. The outcome should enable them to diversify their production, maximise revenue, and minimise risks. Findings made by past consultors seem to be inadequate. XMP will try to establish common ground in producing a review in the form of a coal asset report. The traditional way that coal assets are reviewed will not be used. This report will ensure that reliability and transparency are measured. Coal asset is equivalent to physical coal in the ground. Tools, equipment, and technology are not a company's best asset, but rather the people using them.

A physical review of the tonnages and coal qualities will be undertaken as a final step in this process. The methodology followed is important, therefore it will be detailed when appropriate. This review report goes beyond a standard investigation to offer a resource of value to the Client's business.

Contradictions in previous reports underestimated the true value of the coal assets under the control of the Client. A prime example of this is that the Area 1 mining block does not contain an average 24.50% ash product but is a far higher coal quality block that can likely produce a higher revenue sold at the domestic and international markets. The planned mining areas of Area 2 and Area 2A are of greater concern.

An true evaluation of the assets of the Client can only be done once an accurate and reliable geological information database exists, developed from source data. The percentage yields for some products have been overestimated by the Consultor, differences ranging from small to large in the order of 5%. This could lead to a significant overestimation of the size of the product resource base and potential revenue and is critically relevant to the Area 1 and combined Area 2 blocks.

INTRODUCTION

Following a review of the Client's coal resource assets, we prepared this report to discuss our findings, and facilitate a better understanding of what is available.

Some rules are given for the Area 2 and Area 2A, such as the identification of horizons within the Beta Coal Seam. This is based on the premise that extracting horizons selectively and treating them as product or waste increases the yield factor and decreases processing costs. This is based on the principle of domaining. The more important categories of domaining are the following:

- Identifying and selecting stratigraphic horizons within an individual coal seam or a mining selection where coal seams are near one another, based on the coal quality characteristics, to selectively extract the horizons where practically possible. This is complex but not complicated.
- Identifying and localising areas of devolatilisation that would affect the quality of coal products and the classification of areas known to be present in the larger area but not deemed of interest.
- Identifying and localising areas of potentially high value coal that can be produced, based on the Analytical Information Management System (AIMS). The system is based on economic consideration principles and probably more pertinent to smaller-scale operators than to the Majors who are able to utilise the advantages of economics of scale.

SCOPE OF WORK

The Client requested that XMP provide an executive management report on the data provided on the individual mining blocks, findings to date, and the way forward to optimise the remaining resource base.

To facilitate a better understanding of the geological and coal quality characteristics of the various coal blocks of the Client and to maximise the overall exploitation of the mining areas, boreholes were randomly selected to avoid biasing.

INFORMATION SOURCES

The main sources consulted in compiling this report are the following:

- Coal resource report on the Area 1 pit (dated November 2020)
- Coal resource report on the Area 1 pit (dated 6 June 2022)
- Area 3: Coal resource report on Area 3A pit area (dated September 2020)
- Area 2 and Area 2A: TNC2 Seam Area 2 bankable feasibility study
- Data from the XXX geological database
- Exploration results from the drilling programme managed by the Consultor
- Copies of original geological data from the Consultor
- Relevant SAMREC and SANS2020 reporting codes and requirements
- Knowledge, skill, and competency base of XMP Consulting
- General data and information available in the public domain

PROCESS OUTLINE IN REVIEWING BLOCK AREA 1 COAL RESOURCES

- Collection of information relevant to the area of investigation
- Reviewing available reports and documents relevant to the area for a familiarisation on the background
- Reviewing the amount and quality of data used to compile the geological models and reports
- Standard review – general QA/QC processes
- Auditing, if necessary – specific QA/QC processes
- Forensic audit as required – specialised QA/QC processes
- Conclusions, recommendations, and present findings

DATA AQUISITION

The most important information to address is the processed and unprocessed geological data. The Consultor made their geological database available to us on request, consisting of subset data-type databases, and a second set of data became available on 1 December 2022. Missing data sets were identified. The content of the Consultor data can be grouped into the following three categories:

- The 2020 and 2022 resource estimate reports compiled and received from the Client on the Area 1 mining block.
- Extracts from their geological database, relevant to the area of interest, as requested.
- Responses to queries.
- Information retrieved from our own geological information archive data management system.

REVIEW OF RESOURCE ESTIMATE REPORTS

On face value, the 2020 resource estimate report appears to be relatively complete and acceptable:

- Well-defined Alpha and Beta Coal Seams in an area extensively mined in the past.
- An additional 10 boreholes were drilled and managed by the Consultor and can be classified as confirmation boreholes.

2022 resource estimate report:

- Mining has commenced since the 2020 report.
- Some discrepancies appear. Beta Coal Seam is defined as consisting of roof and floor horizons and no evidence could be found of the relevance of the definition/s.

AVAILABLE INFORMATION ON THE AREA OF INTEREST PRIOR TO THE 2020 AND 2022 REPORTS

The following is known:

- → Beta Coal Seam exhibits a characteristic zoning or stratification pattern and is generally about 6m thick.
- → An inferior quality zone towards the top consists of more than one lithological unit with a percentage ash generally exceeding 40%. It was generally left in the roof during underground mining. This horizon can be termed the Upper Horizon.
- → An exceptionally high-quality coal zone below the Upper Horizon of some 4m or more was the target of selected mining in past years. The top portion was overall left in the roof when the mining hight was constrained to 3m. This horizon can be termed the Middle Horizon.
- → Occasionally a Lower or Bottom Horizon is present containing inorganic layers.
- → The distribution of the Alpha Coal Seam is relatively consistent, in the order of 4m, and contains relatively regular coal qualities. However, it is of a lower quality than the Middle Horizon of the Beta Coal Seam and not mined underground, due to a thin parting after Beta Coal Seam.
- → A limited number of geological borehole profiles were made to confirm the characteristics of the in-seam zoning or stratification, initially based on the percentage ash.
- → Boreholes were drilled prior to the involvement of the Consultor.
- → Confirmation boreholes were drilled by the Consultor.
- → The old and new boreholes are near to one another.
- → The following is a major area of concern. There is no lithological and geological validation between the new confirmation boreholes drilled by the Consultor and the old boreholes that exhibit the characteristic stratification nature of the Beta Coal Seam.

ZONING OR STRATIFICATION WITHIN THE BETA COAL SEAM – OLD BOREHOLES

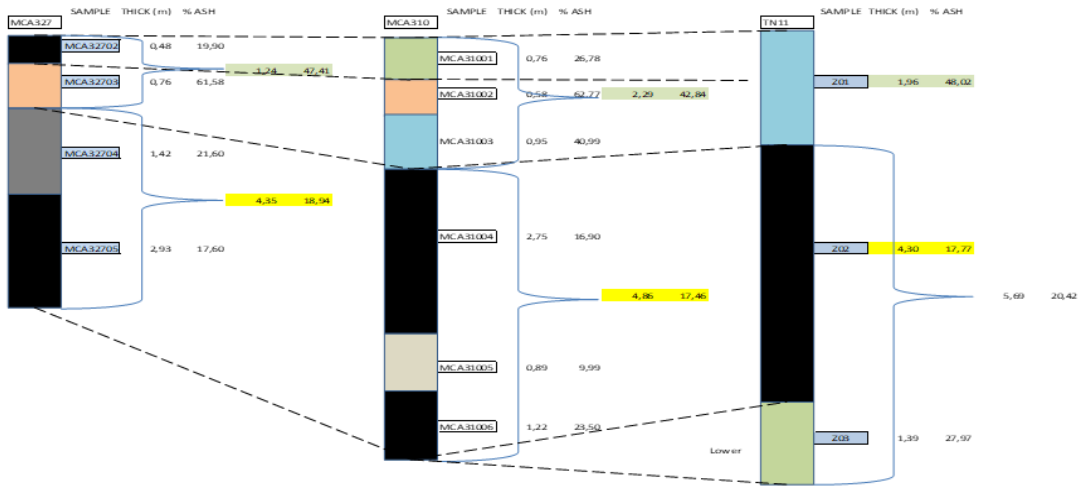


Figure 1: Illustration of the stratification profiles within the Beta Coal Seam.
Please take note that the figure is not a geological cross-section.

ZONING OR STRATIFICATION WITHIN THE BETA COAL SEAM – OLD AND NEW BOREHOLES

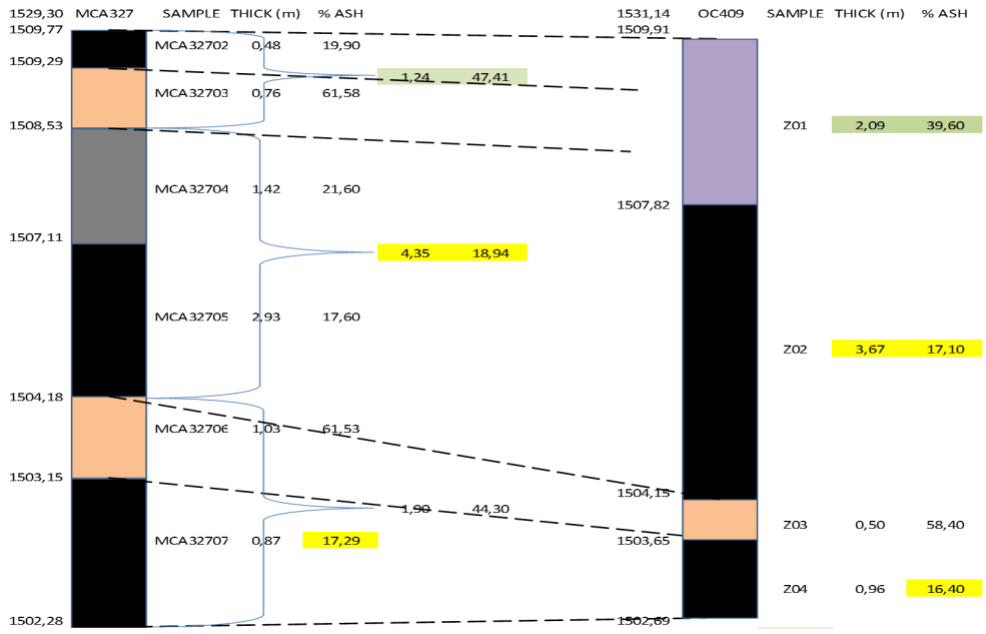


Figure 2: Illustration of the inconsistent sampling methodology employed in borehole Area 1-01 with TN11 as the old control borehole

It should be clear from Figure 2 that the geology of the old Borehole Y and that of the newly drilled Consultor borehole, Area 1-01 do not compare. The top portion of borehole Area 1-01 is far too thick at 3.33m (Z01), while the ash content of 28.71% is far too low, needing to be >40% ash. The 3.33m sample was defined as the roof coal section of the Beta Coal Seam. The second sample from the top (Z02) is far too thin. The second last sample from the base (Z03) with a thickness of 0.24m was identified as a carbonaceous shale, however the percentage ash of a carbonaceous shale is 60–70%, while this clearly indicates a heavy dull coal. The sampler assumed that all material would sink at a relative density of 1.80, which is not accurate.

CONCERNS

Sample Z03 was not washed and only an in situ raw coal analysis is available. A washability table or profile cannot be compiled for the specific sample as washability data is not available. The washability table or profile for the Beta Coal Seam can similarly not be compiled.

It is unfortunate that costs of the Beta Coal Seam are deemed to be useless. A deliberate bias was introduced as the geological characteristics of the area were not studied prior to the latest drilling programme. Figure 2 illustrates the unreliable sampling methodology employed by the Consultor – see borehole Area 1-01.

CONTROL BOREHOLE Y, SELECTED CONSULTOR BOREHOLE AREA 1-09

The conditions described in Figure 2 with reference to borehole Area 1-01 are similar to borehole Area 1-09 in Figure 3. The top sample (Z01) with a thickness of 2.09m and an average ash content of 39.60% is anomalous. It is expected that the sample should consist of an inorganic layer of 0.80m and a corresponding ash content in the order of 60% in the carbonaceous mudstone range. Technically, there are no interbedded shales in the Vryheid Formation or within the coal seams.

Sample Z02 should represent the middle stratigraphic horizon or Beta Select and is thinner than expected because material from this horizon was incorrectly included in the high ash horizon. Both samples (Z01 and Z02) are contaminated, introducing bias.

CONCERNS

A bias was introduced when the geological characteristics of the area of interest were not studied prior to the latest drilling programme. Figure 3 illustrates the inconsistent sampling methodology employed by the Consultor, showing borehole Area 1-09 with Borehole Y as the old control borehole.

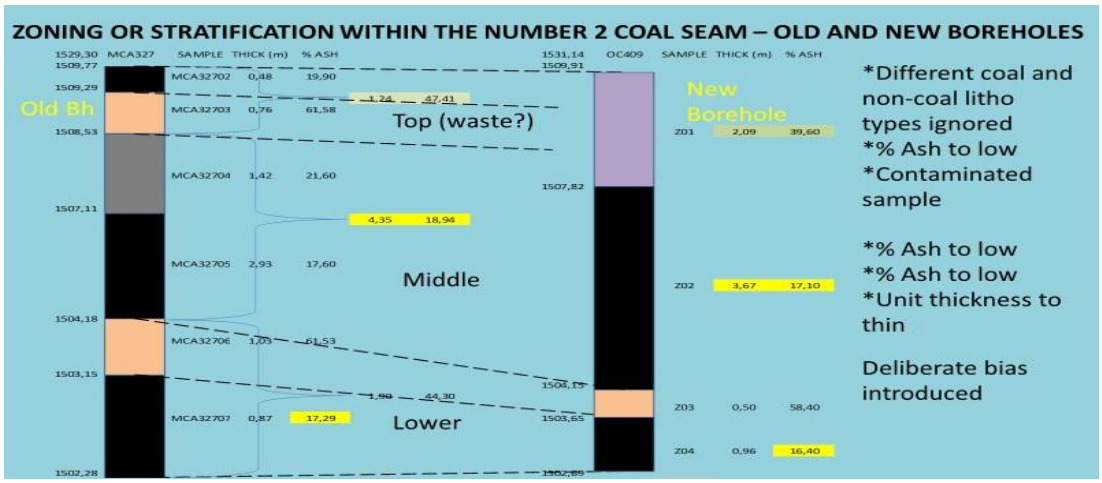


Figure 3: Illustration of the inconsistent sampling methodology employed in borehole Area 1-09

CONTROL BOREHOLE X, SELECTED CONSULTOR BOREHOLE AREA 1-08

The newly drilled Area 1-08 is 43m from old control Borehole X, with very little variation in the coal geology expected in a stable depositional environment. A cross-correlation with other old boreholes indicate that in approximately 1.64m of the middle section, also known as Beta Select, high quality coal is included into the inferior quality coal horizon.

CONCERNS

The consequences of this would impact directly on optimising the resource and obtaining the best product from the Beta Seam.

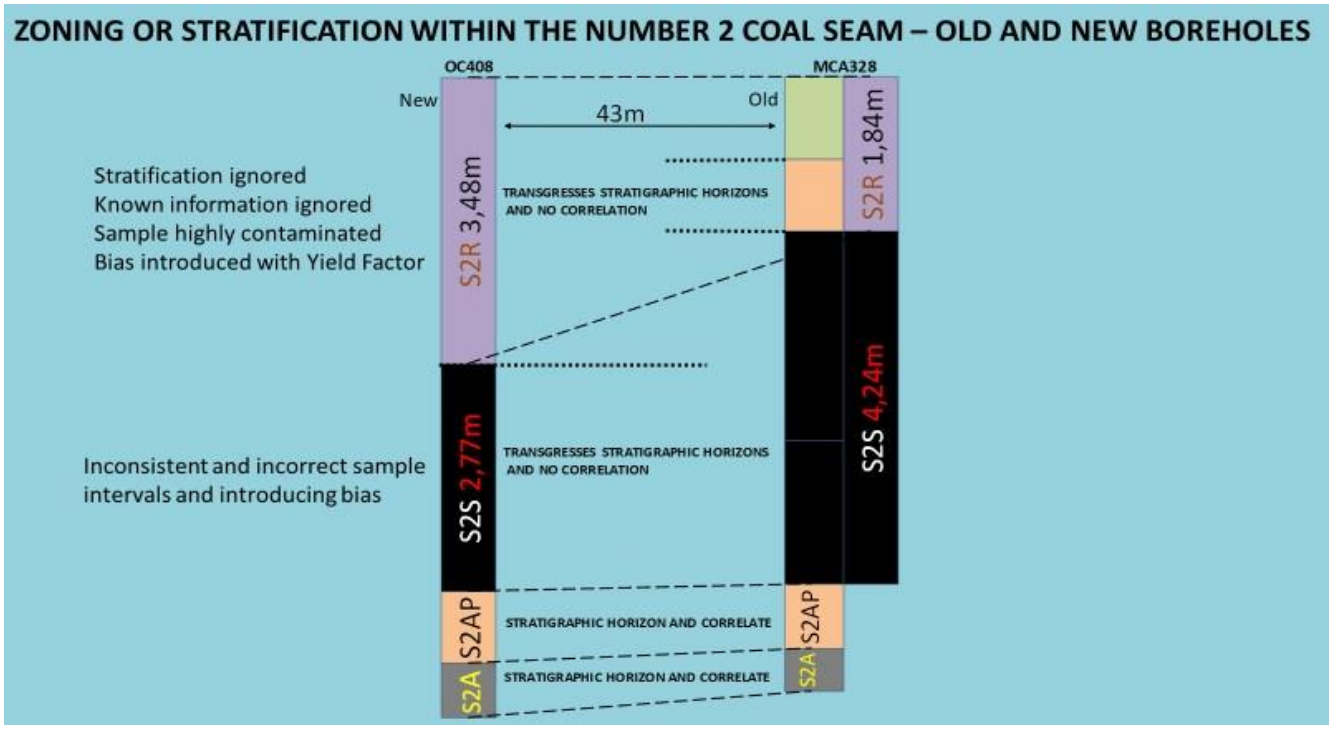


Figure 4: Illustration of the conflicting sampling methodology employed in Borehole Area 1-08

The bigger the deviation between a correct selection of the individual horizons and the Consultor selection, the bigger the implications on decision-making. The following section will deal with some of the more important negative effects. The geological data and other information available on Boreholes X and Area 1-08 (shown in Figure 5) will be expanded on to illustrate the consequences of the inconsistencies and non-conformance.

Figure 5 clearly shows the anomalous thicknesses and associated coal qualities when sample intervals are incorrect and the associated incorrect identification of the individual horizons. The old control Borehole X details the correct horizons while the Consultor Area 1-08 does not. The thickness for the 2 Seam Roof coal is reported as 1.84m for the control Borehole X while the Consultor identified a 3.48m thick horizon, a significant difference with the two boreholes only 43m apart. The ash of the Beta Seam Roof coal for control Borehole X is 46.72% and correlates with the rest of the old boreholes, while the Consultor borehole (Area 1-08) reports a 34.48% ash for the horizon identified (Figure 5). The Beta Seam Roof coal of the Consultor borehole was included in the model to estimate the coal resource base and associated qualities. This further supports that the drilling programme was planned without understanding the geological characteristics of the deposit.

CONCERNS

The consequences of this will impact directly on the correct selection of selective mining horizons to optimise the resource and to select the best product from the Beta Coal Seam Roof. Should a decision be taken to treat the horizon as a waste horizon, high-quality coal would end up in the discards, leading to a loss in revenue.

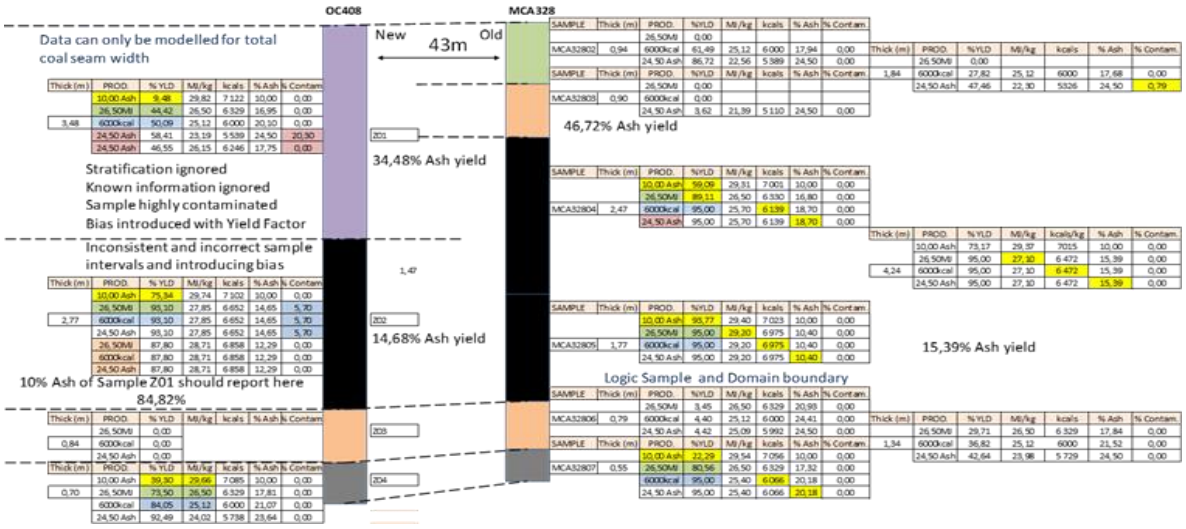


Figure 5: Illustration of the effect on coal quality distribution and characteristics associated with the incorrect selection of the appropriate sample intervals and incorrect identification of horizons

Control Borehole X shows that the Beta Seam Roof coal horizon consists of two lithological units of approximately similar thicknesses. The upper lithological unit contains an average quality coal (26.49% ash), while the bottom portion is an inorganic unit with an ash of 63.62%, i.e. a carbonaceous mudstone. The procedure would involve investigating the variation in coal quality characteristics where more than one sample increment is present. This is only applicable to Borehole X, as only one sample was taken for borehole Area 1-08 (Table 1).

SELECTED BENEFICIATED COAL PRODUCTS AND CHARACTERISTICS – BOREHOLE X							
SAMPLE	**Thickness (m)**	**Product**	**YLD %**	**MJ/kg**	**kcal/kg**	**Ash %**	**Contamination %**
Borehole X-02	0.94	26.50MJ	0				
		6000kcal	61.49	25.12	6 000	17.94	0
		24.50% ash	86.72	22.56	5 389	24.5	0
Borehole X-03	0.9	26.50MJ	0				
		6000kcal	0				
		24.50% ash	3.62	21.39	5 110	24.5	0
Composite	1.84	26.50MJ	0				
		6000kcal	27.82	25.12	6000	17.68	0
		24.50 ash	47.46	22.3	5326	24.5	0.79

Table 1.

Some mining operators are prepared to mine a coal seam with a minimum thickness of 0.50m while others set the minimum at 1m, with no strict rule and economic considerations ultimately driving the decision. For the following discussion, a minimum cut-off of 1m is used, with the composite thickness of the Beta Seam Roof coal at 1.84m (Borehole X). This is considered a thin seam mining operation, but not difficult to manage during the mining. A difference in the number of potential coal products can be seen between the two boreholes from the Beta Seam Roof coal (Table 2 and Figure 5). Four primary products can be produced form the Area 1-08 borehole and only two from the old control Borehole X.

The processing of a secondary product from the discard of the 10% ash primary product has not been addressed and would add another product, increasing the number to 5. A 44.42% yield for a 26.50MJ/kg product is high, and a producer may consider it prime product. However, 38m away the yield for the same product is zero. This points to an extremely highly variable coal quality deposit, extremely difficult to manage, a direct result of the contamination of the inferior quality top portion of the Beta Seam. At the Borehole X locality, such coal can be produced with a yield of 47.46% (Table 4), while only 38m away the yield increases to 58.41%. This significant increase in the yield indicates a high variability in the characteristics of the Beta Seam Roof coal. It should be carefully noted that the processed product is contaminated with inorganic material in the form of carbonaceous mudstone at 20.30% by mass. The best quality uncontaminated coal product is a 17.75% ash.

INACCURATE SAMPLE INCREMENTS OF BETA SEAM ROOF COAL							
SAMPLE	**Thickness (m)**	**Product**	**YLD %**	**MJ/kg**	**kcal/kg**	**Ash %**	**Contamination %**
Area 1-08	3.48	10% ash	9.48	29.82	7 122	10	0
		26.50MJ	44.42	26.5	6 329	16.95	0
		6000kcal	50.09	25.12	6 000	20.1	0
		24.50% ash	58.41	23.19	5 539	24.5	20.3
		24.50% ash	46.55	26.15	6 246	17.75	0
Composite Borehole X	1.84	26.50MJ	0				
		6000kcal	27.82	25.12	6000	17.68	0
		24.50 ash	47.46	22.3	5326	24.5	0.79

Table 2.

The consequence of taking the incorrect sampling intervals worsens when Beta Select is evaluated.

INACCURATE SAMPLE INCREMENTS OF BETA SEAM SELECT COAL HORIZON							
SAMPLE	**Thickness (m)**	**Product**	**YLD %**	**MJ/kg**	**kcal/kg**	**Ash %**	**Contamination %**
Area 1-08	2.77	10% ash	75.34	29.74	7 102	10	0
		26.50MJ	93.1	27.85	6 652	14.65	5.7
		6000kcal	93.1	27.85	6 652	14.65	5.7
		24.50% ash	93.1	27.85	6 652	14.65	5.7
		26.50MJ	87.8	28.71	6 858	12.29	0
		6000 kcal	87.8	28.71	6 858	12.29	0
		24.50% ash	87.8	28.71	6 858	12.29	0
Composite Borehole X	4.24	10.00 ash	73.17	29.37	7015	10	0
		26.50MJ	95	27.1	6 472	15.39	0
		6000kcal	95	27.1	6 472	15.39	0
		24.50 ash	95	27.1	6 472	15.39	0

Table 3.

There appears to be little difference in percentage distribution and coal quality parameters when the control Borehole X is compared to the Area 1-08 borehole, but this is a pseudo comparison. The tonnage per constant surface area is significantly different where the Consultor thickness is recorded as 2.77m and the control borehole is 4.24m. The other major difference is that the high yield of 93.10% represents a coal product with some 5.70% contamination by mass, and the yield decreases to 87.80% when a non-contaminated coal is produced. The Beta Select does not have 24.50% ash as the control Borehole X clearly indicates a 10% or 10–16% ash product. It should be obvious that this needs to be reconsidered.

There are more examples of inconsistencies between the control and Consultor boreholes. The data in the geological database is not correct and should be revised prior to a coal resource/reserve estimation.

COAL RESOURCE REPORT ON AREA 1 PIT – NOVEMBER 2020

The Consultor was first commissioned by the Client to prepare a coal resource estimate report in 2020, with the objective of producing a 24.50% ash product. This was a typical resource report in accordance with SAMREC and SANS codes. 10 more exploration boreholes were drilled and the samples were sent to an accredited coal laboratory.

In the latest report of 2022, the Area 1 mining area went from a planned mining area into production, with the report showing the remaining resource. Our reasons for disagreeing with these findings will be discussed in the following sections.

COAL RESOURCE REPORT ON AREA 1 PIT – 6 JUNE 2022

The resource report of 6 June 2022 deals mainly with the coal resources of the Beta Seam Roof, Beta Seam Floor and Alpha Seam. The reader will find it extremely difficult to reconcile the 2020 and 2022 reports. The terms ‘Beta Seam Roof’ and ‘Beta Seam Floor’ imply that that the Beta Coal Seam is divided into two distinct stratigraphic horizons, namely an upper and lower horizon. The main differences between the 2020 and 2022 reports are summarised in the following table.

COMPARISON BETWEEN 2020 AND 2022 AREA 1 RESOURCE REPORTS

2020 RESOURCE REPORT	2022 RESOURCE REPORT	COMMENT
Pre-mining environment	Mining in progress	The 2022 report should have referred to the 2020 report and provided more detail on its objectives
Addresses the Beta and Alpha resource distribution prior to mining	Addresses the roof and floor portion of the Beta Seam and resources of the Alpha Seam	A reader of the two reports would have reasonably expected a reconciliation of 2020 and 2022 resources since mining commenced, a depletion record and resources gained/lost
Resource Beta Seam: 1 020 976 tons Resource: Alpha Seam 1 603 821 tons	Resource Beta Seam Roof: 253 146 tons Resource Beta Seam Floor: 68 684 tons Resource Alpha Seam: 665 761 tons	The classification of individual resource blocks is confusing to a reader, specifically in the 2022 report. Diagrams (pg. 14) refer to a Beta A Coal Seam with a thickness distribution, but no resource figures are provided in the 2022 report

Table 4.

The 2022 report is not easy to follow and the content is not aligned to the project objective: 'To produce a coal resource estimation report on the Area 1 pit area within the mining right'. There is no clear indication of the definition of the horizons within the Beta Coal Seam nor a stratigraphic column to assist with understanding the subdivision of the coal seam. The objective of the coal resource estimate clearly states that the Consultor was employed to produce a resource estimation report on the Area 1 pit area in their mining right property, situated in the Kriel Magisterial District in Mpumalanga. The first question that arises is whether the so-called Beta Select Seam is redefined as Beta Seam Roof and Floor.

Data Reliability (3.2.2, pg. 15 of 28): Reference is made to the field work conducted by the Consultor, without reference to existing geological data in the area acquired from third parties. Errors are known to be present in the XX coal database, compiled from different data sources. Access to the original XX database was established in this regard.

There are more examples of how stratification was not identified or ignored by the Consultor. The consequences are that the Consultor boreholes cannot be used for an assessment of potential products from the Beta Coal Seam. The coal quality of the horizons within the Beta Coal Seam were artificially decreased/increased, incorrectly identifying target products. Revenue could be lost through not selecting the best product for the market, as a 24.50% ash is not the only coal to be produced from the remaining resource.

Standards of work performance: The description of the core material and sample intervals do not conform to standards. The following are important aspects to address:

- → The Consultor boreholes cannot be used for an assessment of potential products from the Beta Coal Seam due to non-consistent sample intervals.
- → Samples are not identified and adequately described and are referred to generally as "coal". This cannot be used for quality control during mine operations.
- → The field work does not conform to the basic requirements of description of borehole core and the sampling of the coal seams.

Reading the resource estimate report affords the impression that:

- → The Consultor was not familiar with the geological depositional characteristics of the area of interest prior embarking on an exploration programme.
- → The existing geological borehole information of the borehole/s near the newly planned boreholes was not consulted to anticipate characteristics of the new planned boreholes. This resulted in the wrong sampling intervals, not in agreement with existing and established geological characteristics.

Additional investigations required outside the scope of work: Incomplete past work necessitates additional research outside the normal scope of work associated with the review. It was necessary to assess if the appropriate decisions were taken prior to mining activities and whether opportunities were lost.

SUMMARY AND CONCLUSIONS ON THE STATUS OF THE CONSULTOR GEOLOGICAL DATABASE

The results revealed errors and inconsistencies:

- Firstly, in comparing the geological and analytical characteristics of old and new boreholes to identify the potential of the Beta and Alpha Coal Seams.
- It cannot be assumed that a 24.50% ash is the best product. Clearly, there are indications that alternative products of a higher value can be produced, with markets seeking lower ash and higher heat value products.

This necessitated additional work as follows. The investigations listed were undertaken:

- Compiling borehole profiles of old and new boreholes and calculating products over a range of in-seam units/zones. There is evidence that the new Consultor boreholes did not add value to the product selection, due to incorrect sample intervals taken (Beta Coal Seam). The Alpha Coal Seam data confirms its basic coal quality distribution.
- Reviewing the Consultor geological information database system and sub-databases to verify whether sufficient data was available to undertake the study.

An evaluation of the Consultor database clearly showed the following omissions:

- The non-existence of the fractional washability data is a critical omission and errors in the fractional data are masked by the cumulative washability data.
- The percentage yield factor of the cumulative data was normalised to 100%, only applicable to a specific sample, only for the +0.50mm particle size material, and cannot be used for composite samples. All weighted averages, where a series of samples are combined, are not correct and the deviation from the true calculated value could be relatively small or big. It will also vary within a specific selected horizon depending on the specific product selected and the cut point RD.
- In the absence of a -0.50mm particle size material analytical database, two or more samples cannot be combined to calculate average coal quality values for the series of samples. The analytical models for resource reports are therefore not 100% accurate.
- The source data or XX analytical database contained numerous errors that were not corrected in the Consultor database. The important point is that incorrect data is present:
    - The phosphorous content of many MCA boreholes appear in the total sulphur field and the average total sulphur of the two resource reports is incorrect.
    - The density intervals of the Consultor boreholes in the electronic analytical database and those reported in the laboratory certificate are not the same:
        - The reported relative density commences at 1.50 (laboratory certificate, Consultor boreholes), with incremental increases to 1.85 and the analytical results of the sink fraction at a relative density of 1.85.
        - The electronic database indicates that the washability data commences at a relative density of 1.35, with equivalent half-step increases to 1.80 and the analytical results of the sink fraction at

a relative density at 1.80. The original data was manipulated to fit modelling requirements.

- The XX analytical database contains adjusted data, where a computer programme is used to estimate the quality parameters of the in-between relative density intervals, regardless of the original starting relative density. It extrapolates the washability table down to a relative density of 1.35. The consequences are the following:
  - We previously evaluated the results of the XX computer programme against actual data, calculated back a cumulative washability table to a fractional washability table, and rejected the estimations. Negative values are not that uncommon.
  - The Consultor analytical borehole data contains four interpreted relative density coal parameters below the first relative density of 1.50 and not acceptable. Critical errors could be present at the lower end of the S-curve washability graph, specifically for lower relative density coal products. The opportunity to investigate the potential to produce higher value coal products at a higher price at a lower relative density is lost.
- The inconsistencies in the particle size distribution between the various boreholes in the geological database result in the introduction of bias in the interpretation of analytical results. The smaller the top size, the higher the liberation factor of the better-quality coal and higher percentages yield at lower fluid relative density. The standard in industry and specifically for the Witbank-Highveld Ridge Coalfields is to perform washability testing according to the following particle size requirements and fluid relative densities:
  - Top particle size is 25mm.
  - The bottom particle size is generally 0.50mm as the -0.50mm particle size material is screened-out.
  - Some companies prefer a split between -25mm and +10mm and -10mm to + 0.50mm to assess liberation factors.
  - The -25mm +0.50mm particle size material is subjected to washability testing while raw coal analysis is performed on the -0.50mm particle size material.
- The Consultor decided on a top size of 12.50mm for the washability testing and the industry norm is 25mm.
  - Liberation of the higher quality coal layers was achieved and the yield factor was artificially increased in the lower relative density material, with bias introduced.
  - The top particle size of 12.50mm is very close to the minimum size for a pea coal product in the range of fine coal/duff product, and not appropriate.
  - Two populations of particle sizes cannot be modelled simultaneously unless liberation factors are applied.
- The Consultor database does not conform to industry standards. It is the prerogative of the Client to decide whether to accept it.
- Without correcting and upgrading the Consultant database, all subsequent modelling could be a wasteful expenditure.

POTENTIAL PRODUCTS FROM AREA 1 COAL BLOCK

It is clear that the Beta Coal Seam can be subdivided into three distinct stratigraphic units or zones (Figure 6). The top portion provides an opportunity to produce a 6000kcal/kg at a 27.82% or a 24.50%

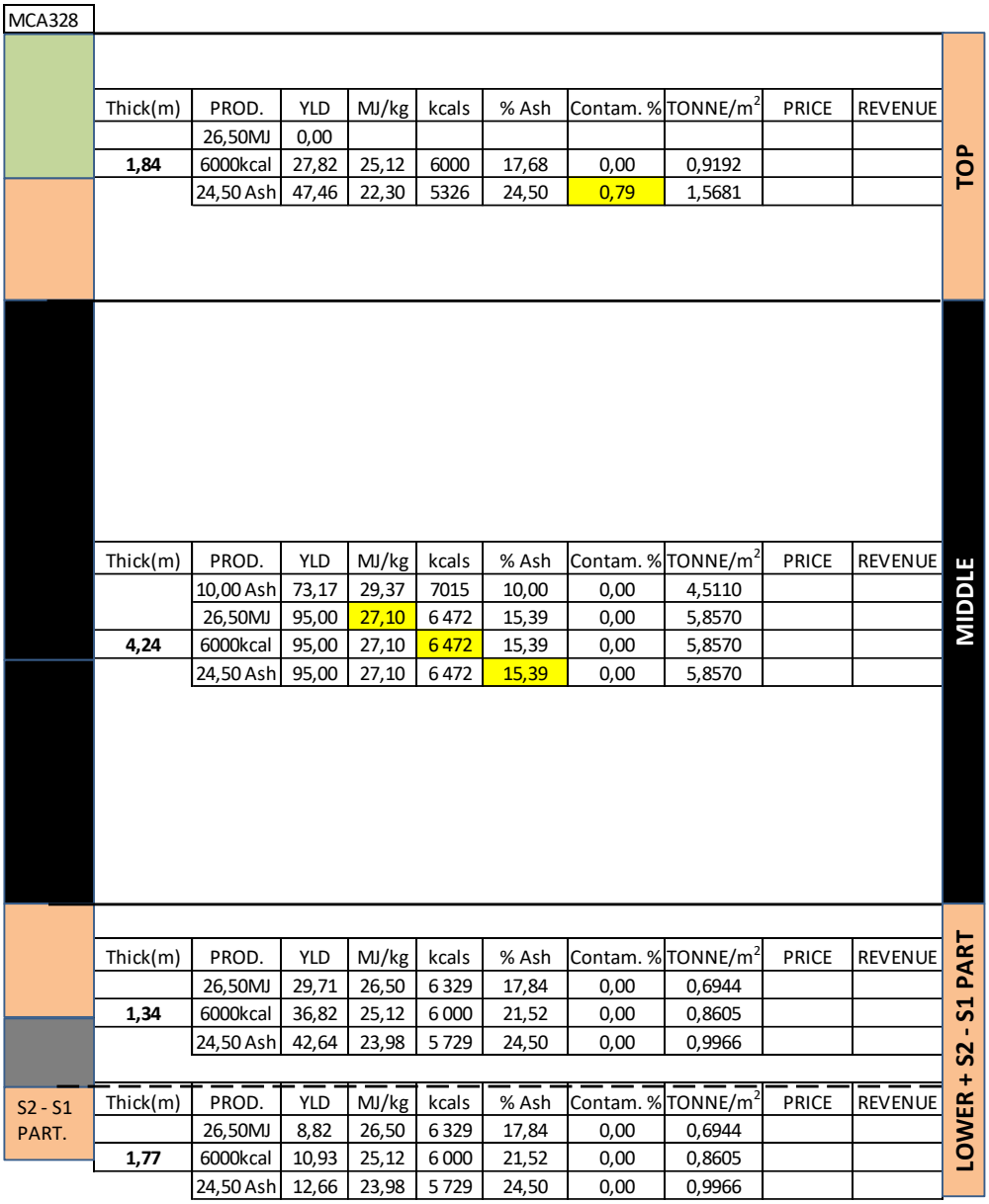
ash product with a yield of 47.46%. The unit of 1.84m is a reasonable mineable thickness. The Consultor reports refer to this stratigraphic unit as the Beta Seam Roof Coal. The middle zone/unit is relatively thick, in the order of 4.24m, offering the opportunity to produce at least four different coal products (Table 5). The following are critically important when selecting a product of choice:

- The exceptionally high yield of a 10% ash product, in the order of 73.17%, can be classified as a low ash product. This was the target in the past where a 7% ash yield was the prime product. This coal product was suitable for the Japanese low ash market or the domestic metallurgical industry, should other required coal properties be within specification.
- A minimum of 26.50MJ/kg coal product can be produced with an estimated yield factor of 95%, suitable for the domestic cement industry with an ash of 15.39%. A similar quality coal is currently being imported from Botswana into South Africa at a high additional transport cost. It is technically not possible to produce a 26.50% ash product unless heavily contaminated with external contaminants, and the worst quality coal will be a 27.10MJ/kg product. The coal does not require beneficiation and probably only screening and crushing.
- A target product of 6 000kcal/kg can only be produced as a run-of-mine (ROM) product after the -0.50mm particle size fraction is screened out, should fine coal not be allowed in the product. The heat value of the product will, however, exceed the coal quality required, with a value of 6 472kcal/kg and an estimated yield of 95%, which is a screened ROM coal product.
- It is useless to produce a 24.50% ash coal as the worst quality product should be 15.39% ash at an estimated yield of 95%, a screened ROM product.

EXAMPLE OF PRODUCT SELECTION WITHIN MIDDLE SECTION OF BETA COAL SEAM

SAMPLE	Thickness (m)	Product	YLD %	MJ/kg	kcal/kg	Ash %	Contamination %
Borehole X	4.24	10.00 ash	73.17	29.37	7015	10.00	0.00
		26.50MJ	95.00	27.10	6 472	15.39	0.00
		6000kcal	95.00	27.10	6 472	15.39	0.00
		24.50 ash	95.00	27.10	6 472	15.39	0.00

Table 5.



Thick(m)	PROD.	YLD	MJ/kg	kcals	% Ash	Contam. %	TONNE/m^2	PRICE	REVENUE
	26,50MJ	0,00							
1,84	6000kcal	27,82	25,12	6000	17,68	0,00	0,9192		
	24,50 Ash	47,46	22,30	5326	24,50	0,79	1,5681		

Thick(m)	PROD.	YLD	MJ/kg	kcals	% Ash	Contam. %	TONNE/m^2	PRICE	REVENUE
	10,00 Ash	73,17	29,37	7015	10,00	0,00	4,5110		
	26,50MJ	95,00	27,10	6 472	15,39	0,00	5,8570		
4,24	6000kcal	95,00	27,10	6 472	15,39	0,00	5,8570		
	24,50 Ash	95,00	27,10	6 472	15,39	0,00	5,8570		

Thick(m)	PROD.	YLD	MJ/kg	kcals	% Ash	Contam. %	TONNE/m^2	PRICE	REVENUE
	26,50MJ	29,71	26,50	6 329	17,84	0,00	0,6944		
1,34	6000kcal	36,82	25,12	6 000	21,52	0,00	0,8605		
	24,50 Ash	42,64	23,98	5 729	24,50	0,00	0,9966		

Thick(m)	PROD.	YLD	MJ/kg	kcals	% Ash	Contam. %	TONNE/m^2	PRICE	REVENUE
	26,50MJ	8,82	26,50	6 329	17,84	0,00	0,6944		
1,77	6000kcal	10,93	25,12	6 000	21,52	0,00	0,8605		
	24,50 Ash	12,66	23,98	5 729	24,50	0,00	0,9966		

Figure 6: Illustration of different coals that can be produced from stratified Beta Coal Seam Borehole X

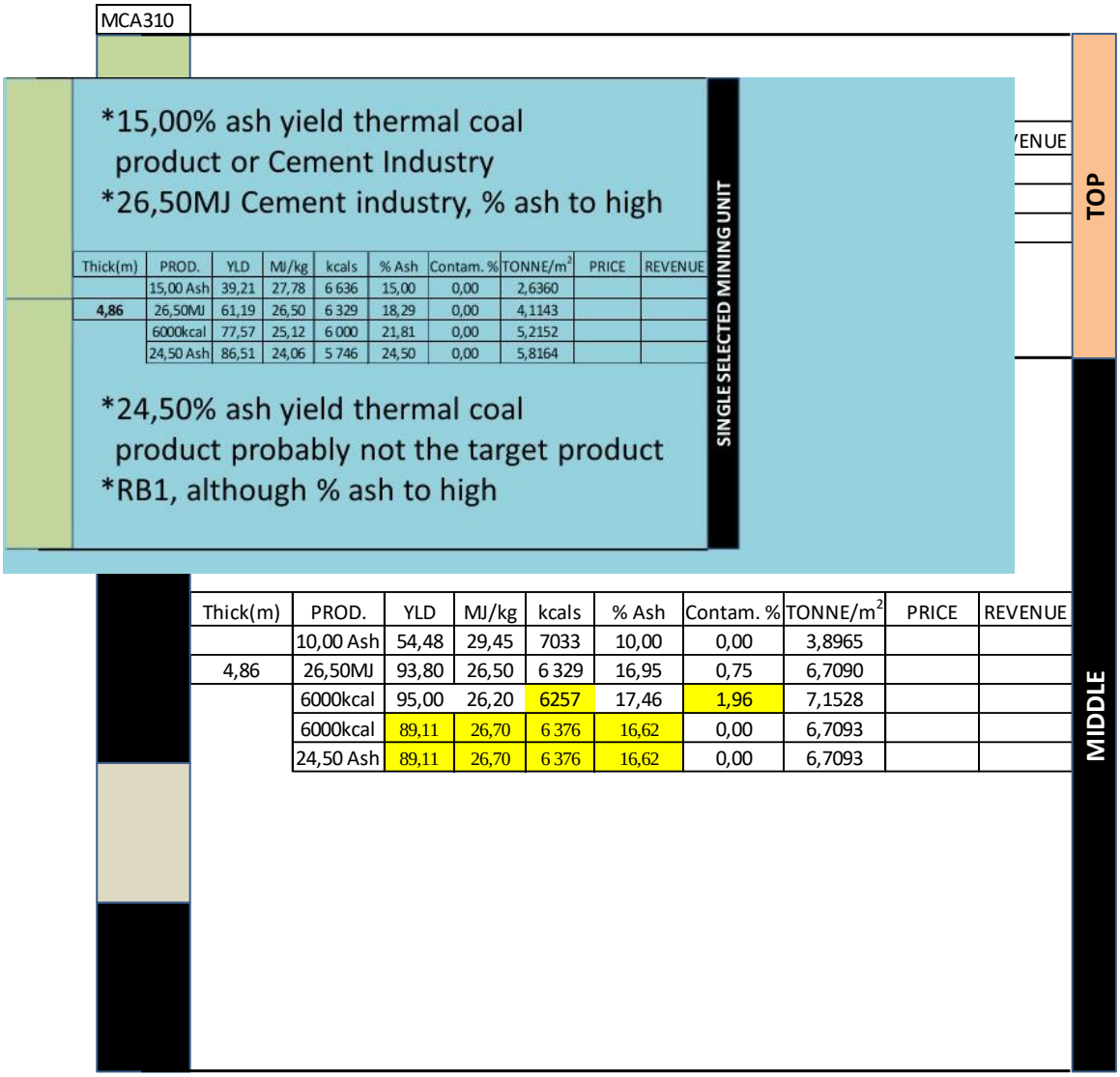
There is no doubt that the middle portion of the Beta Coal Seam is not a 24.50% ash product unit as the thickness of 4.20m represents 57.14% of the total seam thickness of 7.42m.

The lower or bottom portion of the Beta Coal Seam consist of two lithological units, of which the upper unit is an inorganic layer with a thickness of 0.79m and a coal unit at the base with a thickness of 0.55m that is likely a composite selected mining horizon. The composite thickness is 1.34m and can probably be classified as thin seam mining (Table 6). The unit thickness of the lower portion should not be evaluated in isolation. The parting to the lower lying Alpha Coal Seam should be considered from a practical mining point of view as well as economically.

EXAMPLE OF PRODUCT SELECTION IN LOWER SECTION OF BETA COAL SEAM – BOREHOLE X							
SAMPLE	**Thickness (m)**	**Product**	**YLD %**	**MJ/kg**	**kcal/kg**	**Ash %**	**Contamination %**
Borehole X-06	0.79	10.00 ash	0				
		26.50MJ	3.45	26.5	6 329	20.93	0
		6000kcal	4.4	25.12	6 000	24.41	0
		24.50 ash	4.42	25.09	5 992	24.5	0
Borehole X-07	0.55	10.00 ash	22.29	29.54	7 056	10	0
		26.50MJ	80.56	26.5	6 329	17.32	0
		6000kcal	95	25.4	6 066	20.18	0
		24.50 ash	95	25.4	6 066	20.18	0
Composite 06 & 07	1.34	10.00 ash	29.71	26.5	6 329	17.84	0
		26.50MJ	36.82	25.12	6 000	21.52	0
		6000kcal	42.64	23.98	5 729	24.5	0
		24.50 ash	29.71	26.5	6 329	17.84	0
Composite 06 & 07 & parting	1.77	10.00 ash					0
		26.50MJ	8.82	26.5	6 329	17.84	0
		6000kcal	10.93	25.12	6 000	21.52	0
		24.50 ash	12.66	23.98	5 729	24.5	0

Table 6.

Borehole Z provides more evidence of the stratified nature of the Beta Coal Seam and confirms the observations that were made for Borehole X (Figure 7). The top portion is clearly a 24.50% ash product or a 6 000kcal/kg product. A 26.50% ash can well be considered for the domestic market should access to the export market be problematic. A 2.29m unit thickness is classified as medium height mining. The middle portion is once again a high-quality stratigraphic horizon.



Thick(m)	PROD.	YLD	MJ/kg	kcals	% Ash	Contam. %	TONNE/m^2	PRICE	REVENUE
	15,00 Ash	39,21	27,78	6 636	15,00	0,00	2,6360		
4,86	26,50MJ	61,19	26,50	6 329	18,29	0,00	4,1143		
	6000kcal	77,57	25,12	6 000	21,81	0,00	5,2152		
	24,50 Ash	86,51	24,06	5 746	24,50	0,00	5,8164		

Thick(m)	PROD.	YLD	MJ/kg	kcals	% Ash	Contam. %	TONNE/m^2	PRICE	REVENUE
	10,00 Ash	54,48	29,45	7033	10,00	0,00	3,8965		
4,86	26,50MJ	93,80	26,50	6 329	16,95	0,75	6,7090		
	6000kcal	95,00	26,20	6257	17,46	1,96	7,1528		
	6000kcal	89,11	26,70	6 376	16,62	0,00	6,7093		
	24,50 Ash	89,11	26,70	6 376	16,62	0,00	6,7093		

Figure 7: Illustration of different products from stratified Beta Coal Seam Borehole Z

There are more examples of the stratification nature within the Beta Coal Seam and identification of the individual coal product zones. The methodology employed to investigate the coal quality characteristics within the stratified zones or units within the Beta Coal Seam is the only one that should be followed to optimise the exploitation of the coal resource base. It has already been established that the Consultor boreholes cannot be used to develop geological models.

The Alpha Coal Seam is relatively simple compared to the Beta Coal Seam and it appears that there are no real opportunities to employ selective mining methods. This coal seam could therefore be extracted as a single mining horizon. It does not appear that a low ash, high heat value coal is present. Thermal coal could be produced for the market (Figure 8).

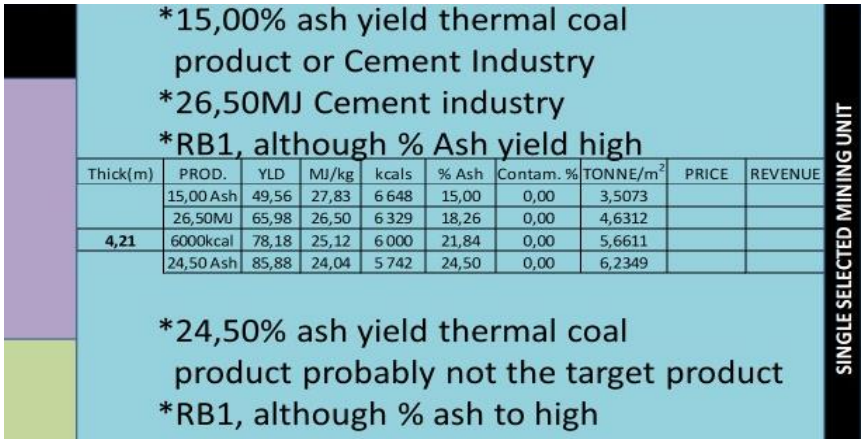
Figure 8: Illustration of different products from Alpha Coal Seam Borehole X

At least four potential products can be extracted from the Alpha Coal Seam. The 15% ash could be suitable for the metallurgical industry, with a yield of 39.21%, and there may be an opportunity to

produce a secondary thermal coal product. The 26.50MJ/kg product could be suitable for the domestic cement industry, although the preferred maximum percentage ash should preferably be in the order of 15%. The same applies to the 6 000kcal/kg product, where the percentage ash should preferably not exceed 15%. Although Figure 8 indicates that a 24.50% ash product is probably not the preferred or target product, it may well be a target product for the Sasol market and financial considerations and access to markets will determine the product of choice.

Borehole Z shows the coal that can potentially be produced from the Alpha Coal Seam, with similar yield and other coal parameters, indicating no significant variation over distance (Figure 9).

Figure 9: Illustration of the different products from Alpha Coal Seam Borehole Z



COAL RESOURCE ASSET BOOK AND DEPLETION – AREA 1 COAL BLOCK

It is difficult to reconcile volumes and tonnages between the two resource reports as this important aspect is not addressed in the 2022 report. It is the norm in industry to reconcile estimated resources, ROM volumes/tonnages, product tonnages, and coal qualities, and provide important information on discount factors. A reconciliation between the 2020 and 2022 coal resource estimates indicates that there are inconsistencies (Table 7).

RECONCILIATION BETWEEN 2020 AND 2022 RESOURCE ESTIMATE REPORTS			
YEAR	**COAL SEAM**	**THICKNESS (m)**	**GTIS**
2020	S2	7.48*	1 074 712
2020	S1	4.24	613 521
2022	S2R	2.9	253 146
2022	S2F	0.88	68 684
2022	S2	3.78*	321 830
2022	S1	4.24	343 931

Table 7.

*2022 2S thickness anomalous value of 3.78m vs 7.48m for 2020 and 7.43m

Depletion of the coal resource is known to have occurred since 2020 following the commencement of mining, and the confusing figures in the resource reports indicate the following. The 2022 report divides the Beta Coal Seam into 2 stratigraphic units, namely the Beta Seam Roof and Beta Seam Floor. The 2020 report sets the thickness of the composite Beta Coal Seam at 7.48m, while the composite thickness is only 3.78m, as reported in the 2022 report (Table 8).

RECONCILIATION BETWEEN THICKNESS DISTRIBUTION AND DEPLETION RATE			
YEAR	**COAL SEAM**	**THICKNESS (m)**	**GTIS**
2020	S2	*7.48	1 074 712
2022	S2 (S2R + S2F)	3.78?	321 830?
2020–2022 depletion	S2		752 882?
2020	S1	4.24	613 521
2022	S1	4.24	321 830
2020–2022 depletion	S1	4.24	291 691?

Table 8.

The review and graphic illustrations clearly indicate that all the resource tables in the 2022 report are incomplete.

There is clear evidence from geological profiles complied that most of the coal resource is not associated with Beta Seam Floor, as stated in the 2022 report – 253 146t (Beta Seam Roof) and 68 684t (Beta Seam Floor). The majority of the coal resource is associated with the higher quality, low ash middle zone.

REMEDIAL PROPOSALS AND PROCESSES TO CORRECT AND UPGRADE THE CURRENT DATABASE – AREA 1 COAL BLOCK

The Consultant geological database cannot be used for modelling. There are, however, processes that can be put in place to correct it overall and upgrade the Geological Information System to an acceptable format. The following are the most important factors or actions to consider:

- → Redesigning and developing a new database format in accordance with the minimum standard
- → Development will be based on the XX geological database, which was the basis for the Consultant geological database
- → The source data of the Consultant geological analytical data would be used, not their current data which is incomplete
- → Should the Council for Geosciences data be available, it would be used for the lithological records which are not available in the XX database

The 2022 report should not be used and the following methodology employed to assess the true potential of the products:

- → Borehole by borehole evaluation of the character and identification of zones, recorded in the Geological Information Database

- Identifying and redefining the individual coal quality horizons from which coal products could be produced, avoiding contamination and optimising product selection and revenue
- Cannot be done in isolation with inputs from mining required. The current mining contractor is suggested
- Assessing the economic potential of the different coal products implies a marketability study

CONCLUSIONS AND RECOMMENDATIONS – AREA 1 COAL BLOCK

All baseline geological data and information must be recompiled to develop a geological database. The Client would be the owner of the database and the format and structure can be employed for other coal projects. It is suggested that a new resource model be developed. XMP can recommend competent modellers who are familiar with the area of interest.

INFORMATION AND CHARACTERISTICS OF PLANNED AREA 2 AND AREA 2A MINING BLOCKS

IMPORTANT INFORMATION SOURCES CONSULTED TO EVALUATE CHARACTERISTICS OF PLANNED AREA 2 AND AREA 2A MINING BLOCKS

The planned Area 2 and Area 2A mining blocks are the Client's next major mining development. They will be a remnant coal pillar extraction operation as the Beta Coal Seam was extensively mined in the past. The following sources were consulted to evaluate the coal resource potential of the two adjacent geographical areas:

- Area 2 bankable feasibility study prepared by XX and approved by XX, undated
- Data from the original XX geological database
- Relevant SAMREC and SANS2020 reporting codes and requirements
- Mining Qualifications Authority (MQA) under the auspices of the South African Qualifications Authority (SAQA) and relevant unit/competency standards registered on the National Qualification Framework (NQF)
- In-house knowledge, skills and competency base of XMP Consulting
- Information available in the public domain

The Consultant did not make data available in writing as requested – specifically, the geological information of the approximately borehole cores and copies of the original analytical certificates.

GENERAL GEOLOGICAL CHARARCTERISTICS OF PLANNED AREA 2 AND AREA 2A MINING BLOCKS

The planned Area 2 and Area 2A coal resource blocks are in an underground mined out area where the Beta Coal Seam was selectively exploited. The middle section or stratigraphic horizon within the Beta Coal Seam was the target horizon where coal was left in the roof and floor, not necessarily due to coal quality constraints but mining hight considerations. Some mined out areas were revisited at a later stage and limited roof and floor coal mining operations employed. It is uncertain whether the roof and floor coal were also processed for the export or domestic markets where the in-situ coal qualities are

inferior to that of the middle section. Planned mining blocks Area 2 and Area 2A are continuous geographical areas and can be treated as one combined geographical resource block. Without going into detail, the following are the more important geological characteristics:

- Multi coal seam environment where Delta, Beta and Alpha are present.
- The Alpha and Beta Coal Seams are relative thick with unique stratification/zoning characteristics, and an opportunity for selective mining within the Beta Coal Seam.
- The coal resource base of the Beta Coal Seam is hosted in remnant pillars of an old underground mined-out area, where coal was extracted for the low ash market.
- Close to surface and amenable for surface mining.
- The Delta Dolerite Sill is not present in the area of interest, however, the thermal effect of the dolerite sill is. Consequently, the coal is devolatilised in places and this is of critical importance to consider for the utilisation potential and marketing.
- The Delta Dolerite Sill occurred above the coal seams prior to erosion.

There are 10 known dolerite sills in Southern Africa of different ages, intruding mechanisms, and thermal effects on the strata. The Delta Dolerite Sill is the dominant sill of interest, identified and classified during 2007.

Although the presence of devolatilisation was not investigated, it is important to address the topic as the thermal effect of the Delta Dolerite Sill must be investigated prior to the commencement of mining. There are some misconceptions when addressing or evaluating the thermal effect by intruding dolerite sills and dolerite dykes. Irrespective of whether devolatilisation is present or not, XMP will provide some additional background information that is likely not available in the public domain. The concepts are not confined to the Client's coal asset areas and can be used to evaluate other deposits, should the company wish to acquire additional coal resources.

The systematic evaluation of the air-dry volatile matter content and the dry ash-free volatile matter content clearly indicate that average values for the total coal seam thickness do not provide any measure of the possible thermal effect by an intruding dolerite body, and specifically a dolerite sill (Figure 10). The dry ash-free volatile matter content for the composite Beta Coal Seam with a thickness of 4.80m is 31.02%, clearly well-above the minimum of 28%, and on face value it will appear that devolatilisation is not present. On further inspection of the analytical characteristics of the coal seam, it becomes clear that the top portion is devolatilised, where the second sample from the top has a dry ash-free volatile matter content of 25.37%, well-below the target of 28%. This directly implies that the top 2.63m of the 4.80m are devolatilised and 3.16m is apparently not thermally affected. A third level of inspection or evaluation is to assess the analytical characteristics of the individual wash fractions. Lower than expected dry ash-free volatile matter coal is present in the lower fluid relative density material. By calculation, is it estimated that approximately 0.30m of the top portion of the third sample from the top is devolatilised, meaning that the pseudo non-devolatilised thickness of 4.80m now decreases to 2.86m or only approximately 49% of the total coal seam thickness.

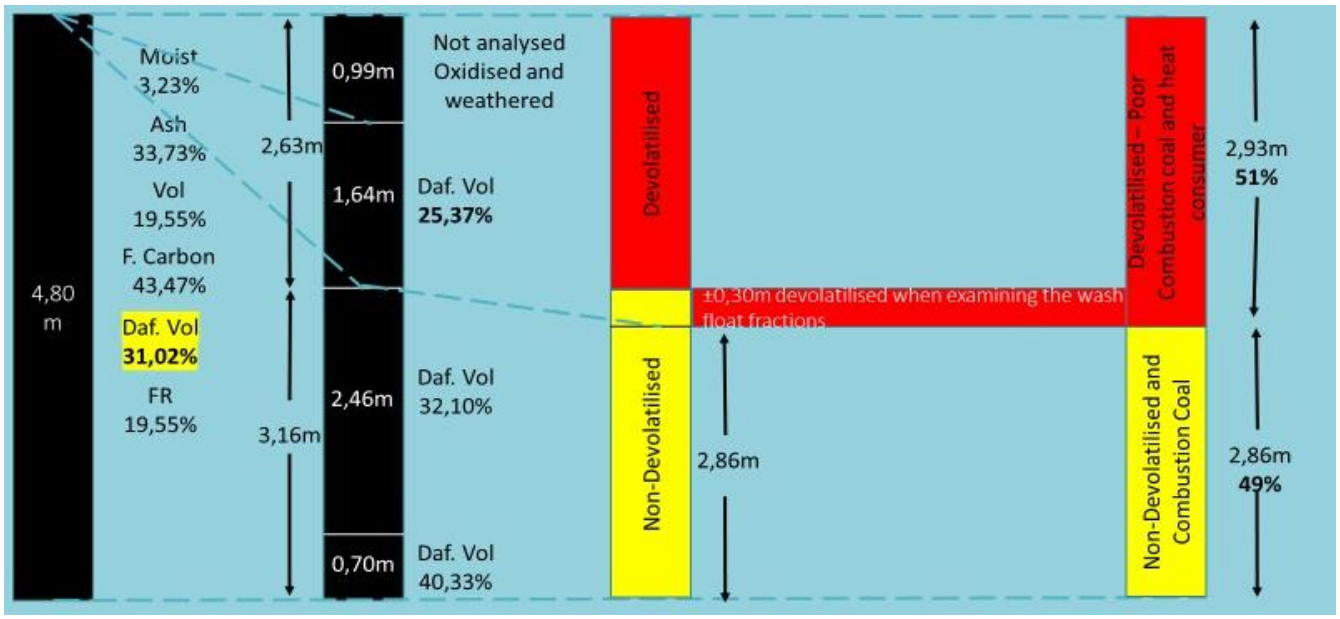


Figure 10: Illustration of methodology to investigate devolatilisation characteristics present in a coal deposit

SIGNIFICANT GEOLOGICAL INCONSISTENCIES THAT AFFECT RELIABILITY OF PLANNED AREA 2 AND AREA 2A MINING BLOCKS

Borehole TN4 was randomly selected to familiarise the reviewer with the general local geology. The legacy XX borehole database and Consultor database (ABC) contain the same data on the identification of the individual coal seams:

- → S4UA 17.73 – 17.87m = 0.14m
- → S4U 19.80 – 20.56m = 0.76m
- → S4L 23.13 – 24.72m = 1.59m

However, showing the geological boreholes on Area 2, Area 2A and surrounding areas (pg. 11 of the bankable study), map 2 provides the following thickness information:

- → 2.50m
- → 4.50m
- → 0.55m

The database and spatial map data are not compatible. There is no legend on the map data and the 2.50m could possibly represent the composite Delta Coal Seam, but no explanation is found for the values of 4.50m and 0.55m and the bankable study.

We took an additional verification process step to assess the accuracy of calculations and therefore the reliability of the reported consultant results. There are some significant differences between theirs and ours. They followed a routine calculation methodology and employed incorrect expressions (Table 9).

OVERESTIMATION OF % YIELD FACTOR AND OMISSION OF % CONTAMINATION TN4 S4U			
SOURCE DATA	**PRODUCT**	**% YIELD**	**% CONTAMINATION BY MASS**
XMP	24.50% ash	86.24	1.3
Consultant	24.50% ash	89.46	0
Absolute difference		**3.22**	**1.3**
XMP	<28.00% ash	96.4	11.7
Consultant	<28.00% ash	100	0
Absolute difference		**3.6**	**11.7**

Table 9.

The absolute difference between the correctly calculated percentage for the 24.50% ash product of 3.22% points is significant. Should contamination be a constraint in the specifications of the user/buyer of the product, then the percentage contamination by mass of 1.30 is classified insignificant. Should the target coal product be a maximum 28% ash product, then the absolute difference in the percentage of 3.60% points is significant. The absolute difference of 11.70% is critically significant when a highly contaminated product is sold to a buyer while a zero contamination is reported by the Consultant. A similar conclusion is reached when the results of the Delta Lower Coal Seam are evaluated (Table 10).

OVERESTIMATION OF % YIELD FACTOR AND OMISSION OF % CONTAMINATION TN4 S4L			
SOURCE DATA	**PRODUCT**	**% YIELD**	**% CONTAMINATION BY MASS**
XMP	6 000kcal/kg	52.28	0
Consultant	6 000kcal/kg	55.44	0
Absolute difference		**3.16**	**0**
XMP	24.50% ash	59.33	6.86
Consultant	24.50% ash	62.92	0
Absolute difference		**3.59**	**6.86**

Table 10.

The differences in the yield factors of 3.16 and 3.59 points are significant. The absolute difference of 6.86 percentage points contamination by mass is critically significant.

The consequences of employing incorrect mathematical expressions and the incomplete evaluation of coal quality characteristics are graver for Area 2 and Area 2A resource blocks than for the Area 1 resource block. The following are some of the more important aspects to consider:

- → The degree of deviation of the percentage yield factor increases with an increase at the relatively density where a product is produced.
- → The degree of average coal quality parameters is aggravated when two or more samples are combined to establish the average coal quality parameters for a composite sample.
- → The degree of inaccuracy and deviation from the true calculated value cannot be quantified without remodelling the coal deposit of interest, based on accurate calculated values.

REVIEW OF AREA 2 AND AREA 2A BANKABLE STUDY REPORT

GENERAL AND MINING SEQUENCE

The Area 2 and Area 2A bankable study report is not a very easy document to read, requiring cross-referencing to follow many apparently conflicting statements. The description of the mining sequence is confusing, and it is not easy to follow or interpret.

- → Resource statement reported in the executive summary on pg. 6: Figures are rounded-off while total ROM is reported to the nearest ton. The same standard of reporting should be reported in the same table.
- → The Beta Seam ROM resource is rounded-off to 4Mt while the rest of the figures are rounded-off to 1 000t.

When dealing with virgin or solid previously unmined coal, it should be relatively easy to follow the planned mining sequence when employing a surface mining method. However, more caution is required when dealing with a previously underground bord and pillar mined-out area. The complexity of the mining sequence increases should selective mining be employed where clear stratification or zoning is present and could enhance the intrinsic value of the project.

The removal and placement of topsoil, softs and hards in different locations or waste dumps is a logical sequence and should be obvious to a reader of the report. The hard material will be removed as bench OB1. It is suggested that the bench definition be changed and that the topsoil bench be named OB1 and the softs bench OB2, with the implication that the hard material bench will change from OB1 to OB3. According to the bankable study report, there will be 13 benches during the steady mining phase, defined as follows:

1. Topsoil Bench
2. Softs Bench
3. OB1 Bench above Delta Upper Seam
4. Delta Upper Coal Seam Bench
5. OB 2 Bench above Delta Lower Seam
6. Delta Lower Coal Seam Bench
7. Delta Lower to Beta Seam Upper Bench
8. Delta Lower to Beta Seam Lower Bench above the Beta Seam – equivalent to the second cut of the parting between the Delta Lower Coal Seam and the Beta Coal Seam, due to the parting thickness of 24.67–26.42m, it cannot be removed in one cut
9. Beta Seam Roof Coal Bench – it is not clear how the Beta Seam Roof Coal will be mined separately as voids exist where underground roof coaling took place. Beta Seam Roof Coal is present in the remnant pillars where underground roof coal mining was not employed
10. Beta Seam Select Coal Seam Bench – equivalent to the middle high quality stratigraphic zone
11. Beta Seam Lower Coal Bench – should be voids in areas where floor coaling was employed
12. Beta Seam to Alpha Seam Parting Bench
13. Alpha Seam Coal Bench

A critical examination of the planned mining sequence raises uncertainties about how effectively extraction of the pillars would be achieved, with specific reference to the planned or possible selective mining of the Beta Seam Roof Coal. The planned mining sequence, as described in the bankable study indicates that the material above Beta Seam Roof Coal would be removed to establish the base of the Delta Lower – Beta Seam Parting Bench. According to the bankable study, roof coaling was employed in certain areas. The drill and blast of the second cut of the parting would displace broken or blasted material into the voids of the mined-out areas and can, as such, be removed, which should not present difficulty. The Beta Seam Roof Coal Stratigraphic Unit will therefore only be present in areas where roof coal mining was not employed (Figures 11 and 12).

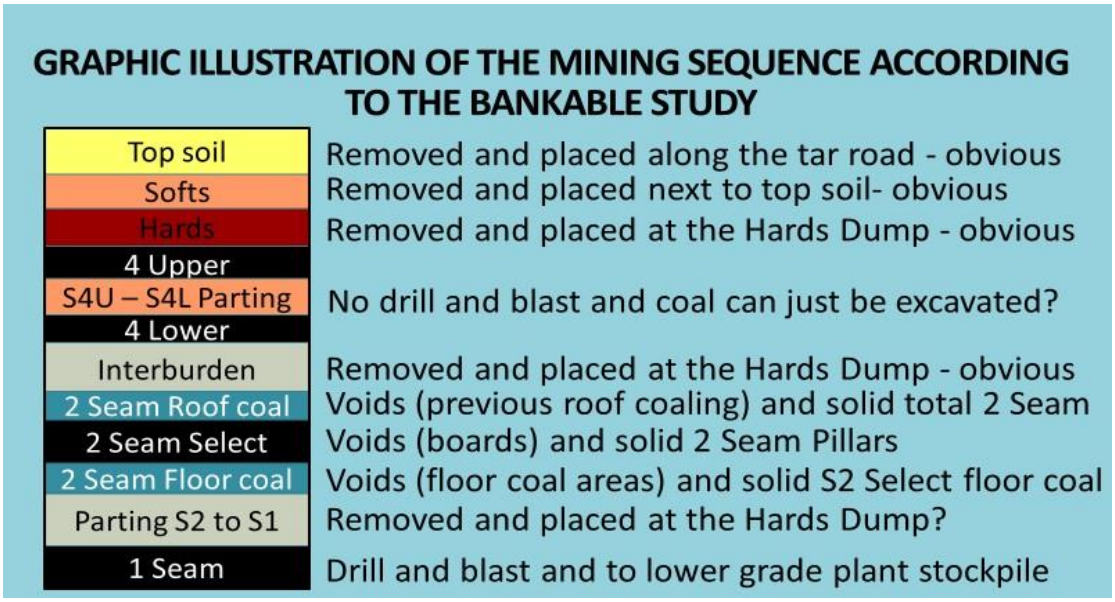


Figure 11: Illustration of planned mining sequence and some uncertainties

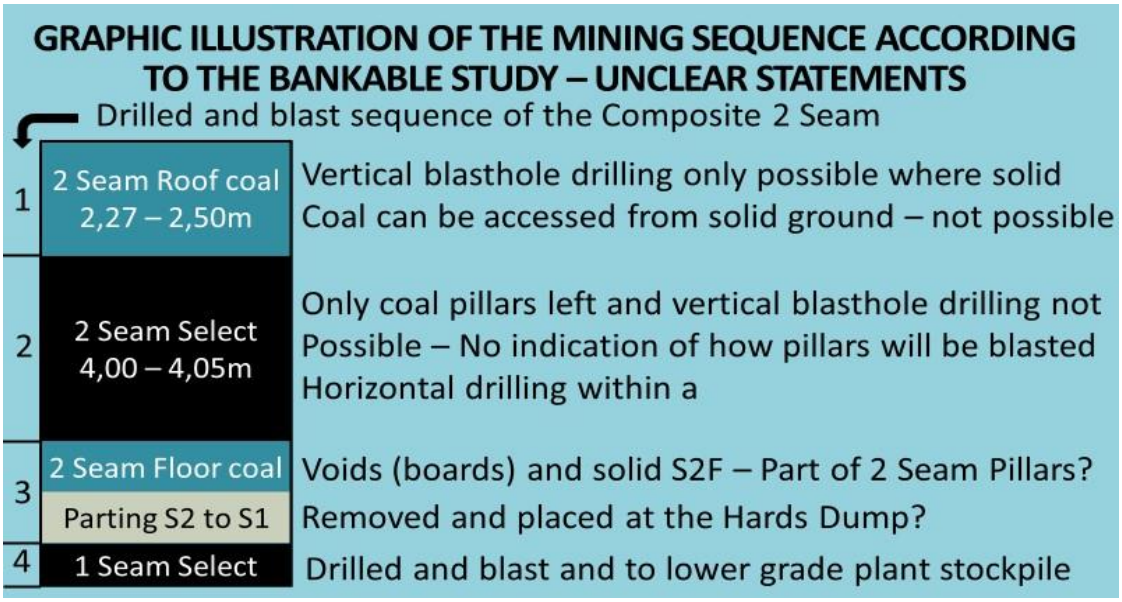


Figure 12: Illustration of the planned mining sequence of the Composite Beta Coal Seam

A critical observation is that remnant coal pillars will be present in the top portion of the Composite Beta Coal Seam known as Beta Seam Roof Coal, and the top of the Middle Horizon, also known as Beta Seam Select, and a combination of the two in a selected mining strip (Figure 13). The problem is how to establish a Beta Seam Roof Bench where the bench floor would be on every individual remnant coal pillar. The only alternative mining sequence is to remove the lower cut of the parting between the Delta and Beta Coal Seams, together with the Beta Seam Roof Coal. Some blast drill holes will end in the voids where top coaling was employed and need to be plugged prior to charging the blast hole with explosives. It would result in excessive contamination of the Beta Seam Roof Coal should the cut be in the order of 10–12m. The second cut in the parting can be reduced to a safe thickness, where remaining material could support the mass of drilling equipment and vehicles, greatly reducing the contamination.

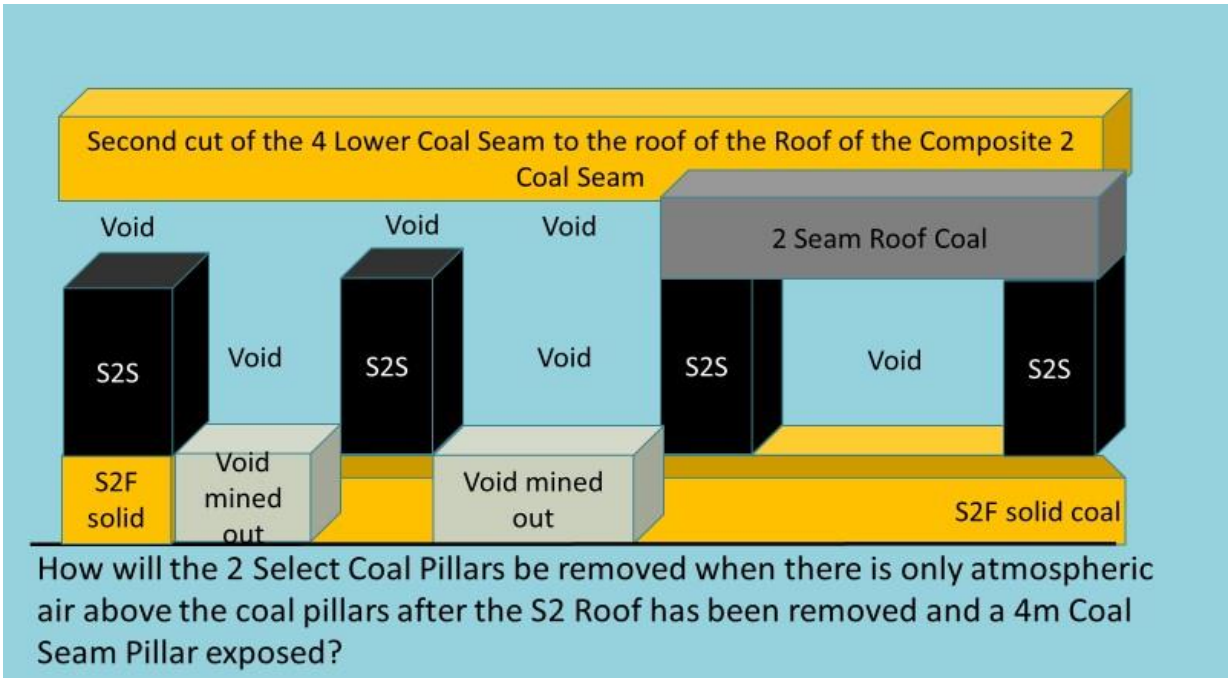


Figure 13: Illustration of voids and partial and solid coal pillars in relatively complex mining environment

A closer examination of Figure 13 suggests that the pit floor is the base of the Beta Coal Seam Select Horizon and the middle unique higher quality coal can be removed selectively should the Beta Roof Coal Horizon be successfully removed. This would result in the pit floor being very uneven. In areas where bottom coaling was employed, there will be depressions in the floor and other areas (Figure 14). It has been found that the smaller the volume of material to be blasted, the larger the surface area over which the material is displaced.

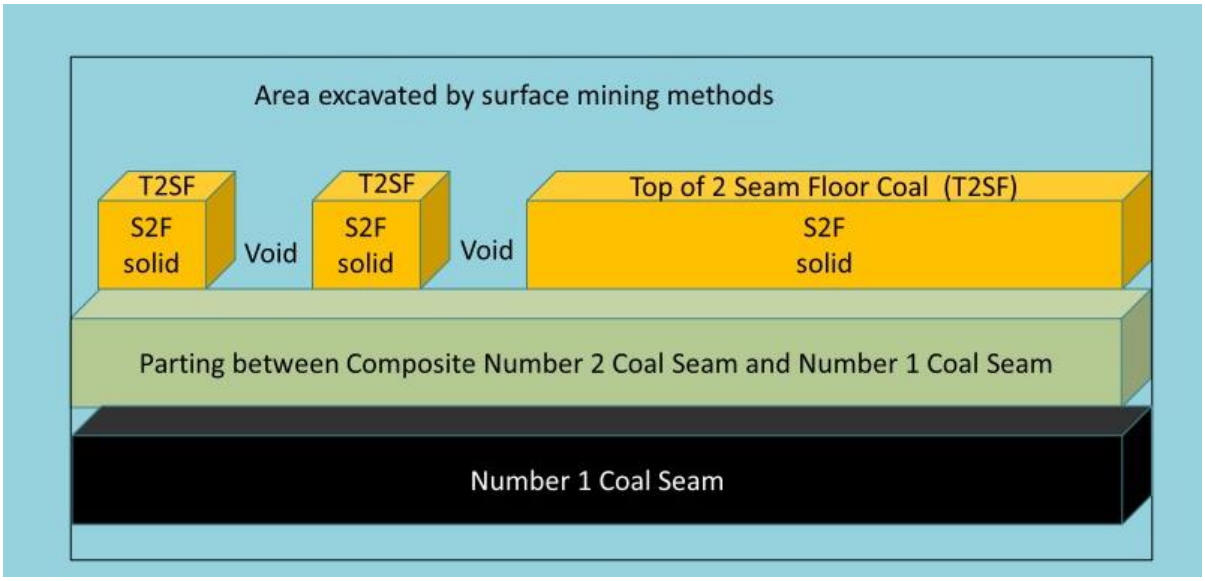


Figure 14: Illustration of uneven pit floor after Beta Coal Seam Select has been removed

APPARENT INCONSISTENT REPORTING OF COAL RESOURCE ESTIMATES

Reference made to coal resource figures throughout the bankable study are not always easy to follow and require extensive cross-referencing. Nevertheless, the following are the main highlights of the resource estimates:

- Tonnage mineable Opencast 4 seam 2 200 000t ROM
- Tonnage mineable Opencast 2 seam 4 000 000t ROM
- Tonnage mineable Opencast 1 seam 3 500 000t ROM
- Total mineable ROM Tonnage 9 661 276t
- Potential sales to export 4 532 000t, Total Saleable Tons = 8 330 000 (pg. 6)
- Total Saleable Tons = 6 755 164.21 (pg. 9)
- Total Gross in situ Ton = 12 629 119 (pg. 9)
- Total in situ resource Ton = 14 303 936 (pg. 14)
- References or definitions of resource categories are not appropriately employed and can be misleading. Overestimation – in situ resource = coal in the ground in its natural undisturbed state (Table 3, pg. 10 and Table 4, pg. 14)
- Potential sales to inland 733 000t
- Potential sales to Eskom and SASOL 3 065 000t
- Total Sales = 8 330 000t, 86.22% overall yield?

Importantly, the overall yield of 86.22% appears to be very high on face value. Additional verification is required, taking into consideration the high contamination that could reasonably expected in establishing the Delta Lower – Beta Seam Parting Bench.

These are of the more important contradictions identified in the bankable study report. It becomes clear that reference to a specific coal resource category could be misleading.

- → Total Saleable Tons = 8 330 000 (pg. 6)
- → Total Saleable Tons = 6 755 164.21 (pg. 9)
- → Total Gross in situ Tons = 12 629 119 (pg. 9)
- → Total in situ Resource Tons = 14 303 936 (pg. 14)
- → References or definitions of resource categories are incorrect by overestimation – in situ resource = coal in the ground (Table 3, pg. 10 and Table 4, pg. 14)

The following are some inconsistencies in discussions on coal processing and products. There are some aspects that must be attended to that can be summarised as follows:

- → It is a myth that the feed tons to the beneficiated plant can be processed at a high relative density of 2.00 or even at 1.90. The knowledge and skills of a competent coal geologist are needed to study the coal quality characteristics and make a recommendation on the procedure to follow for coal products.
- → The saleable coal at a relative density of more than1.80 will be high in ash. The 1.80 relative density is not a generalised density, but should be based on the actual evaluation boreholes within the Area 2 and Area 2A coal blocks.
- → Average coal qualities are meaningless.
- → The consequences of producing and selling a contaminated product are undesirable. The following are the most elementary concepts to understand and take in consideration when dealing with coal, and specifically the beneficiation characteristics of coal, to produce a product for the market:
    - Every coal particle will retain its original in situ characteristics and a non-combustible particle will forever remain non-combustible, irrespective of particle size.
    - There are general guidelines to define additive and non-additive coal parameters. The technological application will determine whether the parameter is additive or not, and must be carefully considered by the producer/seller of the coal product.
    - All yield factors for any beneficiated coal product are incorrect when the -0,50mm is screened-out prior to beneficiation.

CONSEQUENCES OF NORMALISING COARSE COAL FRACTION TO 100%

The ‘true’ calculated percentage yield factor for a coal product depends on the percentage and mass of the -0,50mm particle size fraction that is screened-out prior to beneficiation and could vary from 3–5% points. All factors are therefore overestimated and incorrect.

SUMMARY OF REVIEW OF COAL ASSETS UNDER CONTROL OF CLIENT

The initial scope of work made provision for a review of coal assets under the control of the Client, but the identification of significant conflicts required further investigation to identify the problems. This could imply major financial consequences that should be evaluated to maximise return on investment and sustain the business over time. The following are the more important aspects to consider and address:

- Irrespective of whether the Consultant had made all the requested data and information available, there is more than sufficient evidence present that clearly indicates that they have not added value to the coal assets with their additional drilling and data processing.
- The 'true' potential of the current and future planned mining blocks/resource areas cannot be established. It was clearly illustrated that the Area 1 mining resource area does not contain a 24.50% ash yield product. A far better coal quality can be produced to add additional revenue and enhance the intrinsic value of the mining project area.
- It is unfortunate that the projects have developed this far without recognition and identification of the critical issues with bearing on the economic value of the individual resource areas.
- The Area 1 mining block can be turned around relatively easy in a limited period to enhance the intrinsic value of the mining area.
- The Area 2 and Area 2A resource blocks will be relatively complicated to turn around and will take considerably more time and effort. The coal extraction processes across the two resource areas are significantly different. It is far more complex to deal with selective mining in a remnant coal pillar area than with solid coal in the ground. There is also the risk of high volumes of water, accumulated over time in the old workings.
- The Area 3 mining resource area has apparently been abandoned due to an influx of water from the old underground workings in close proximity, and not yet been addressed.

RECOMMENDATIONS AND SUGGESTIONS/PROPOSALS TO ASSESS TRUE VALUE OF COAL ASSETS UNDER CONTROL OF CLIENT

The 'true' potential of the individual resource blocks can only be established through the development of a reliable, verified geological information database. This can be used as input for all subsequent modelling and decision-making processes in identifying the best coal product that can be produced for the market. The harsh reality is that it must be understood that all required project investigations would commence as if there is coal in the ground of unknown quantities and quality characteristics, with no previous investigations conducted.

It is suggested that the current Area 2 and Area 2A bankable study be revised and updated, should the Client agree with the recommendation that all work be redone to be based on verified information. It is furthermore suggested that the layout and content of the bankable study adhere to a more user-friendly format, based on reliable data, should the area still be earmarked for future development.

It cannot be expected that the Consultant rectifies the identified non-conformances.

It is strongly recommended that the Client consider acquisition of additional coal resources to be jointly developed with the Area 2 and Area 2A coal resource blocks to secure a steady production rate over time where there are many inherent risks during pillar extraction.

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