A COMPETENT PERSONS REPORT ON THE MONTEPUEZ RUBY MINE, MOZAMBIQUE

Prepared For

Pallinghurst Resources Limited

Report Prepared by

srk consulting

SRK Consulting (UK) Limited
UK7367

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EXECUTIVE SUMMARY
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1 INTRODUCTION

SRK Consulting (UK) Limited (SRK) is an associate company of the international group holding company, SRK Global Limited (the SRK Group). SRK has been commissioned by Pallinghurst Resources Ltd ("Pallinghurst"), later renamed as Gemfields Group Limited ("GGL"), hereinafter also referred to as the "Company" or the "Client") to undertake an update of the Competent Persons Reports (CPRs) for the assets of Gemfields Plc ("Gemfields") that SRK authored in 2015. Gemfields is now a 100% subsidiary of GGL, and renamed as Gemfields Ltd. This CPR relates to the Montepuez Ruby Mine ("Montepuez", "MRM", or "the Mine") in Mozambique. Montepuez Ruby Mining Limitada is the mine operator and is 75% owned by Gemfields.

SRK has been requested by Pallinghurst to base the CPR on the MRM life of mine plan (LoMp) reviewed and adjusted by SRK where appropriate. This CPR has been prepared to support the reporting of Mineral Resources and Mineral Reserve estimates in accordance with the South African Code for the reporting of exploration results, Mineral Resources and Mineral Reserves (the SAMREC Code or SAMREC), 2016 Edition.

The Lead Competent Person (CP) with overall responsibility for this CPR is Mr Mike Beare CEng BEng ACSM MIMMM, a Corporate Consultant (Mining Engineering) with SRK. Mr Beare has 23 years' experience in the mining industry and has been extensively involved in the reporting of Mineral Reserves on various diamond and gemstone projects during his career to date. The CP confirms that this Executive Summary is a true reflection of the full CPR.

2 PROJECT DESCRIPTION

The Montepuez Ruby Mine is located in Cabo Delgado province in north-eastern Mozambique, approximately 170 km west of Pemba.

The Montepuez deposits were discovered in 2009 where after there was a large influx of artisanal miners to the area. Gemfields' involvement commenced in June 2011 when a Joint Venture agreement was signed between Gemfields Plc and Mwiriti Lda, the original title holder.

Figure ES 1: Project Location

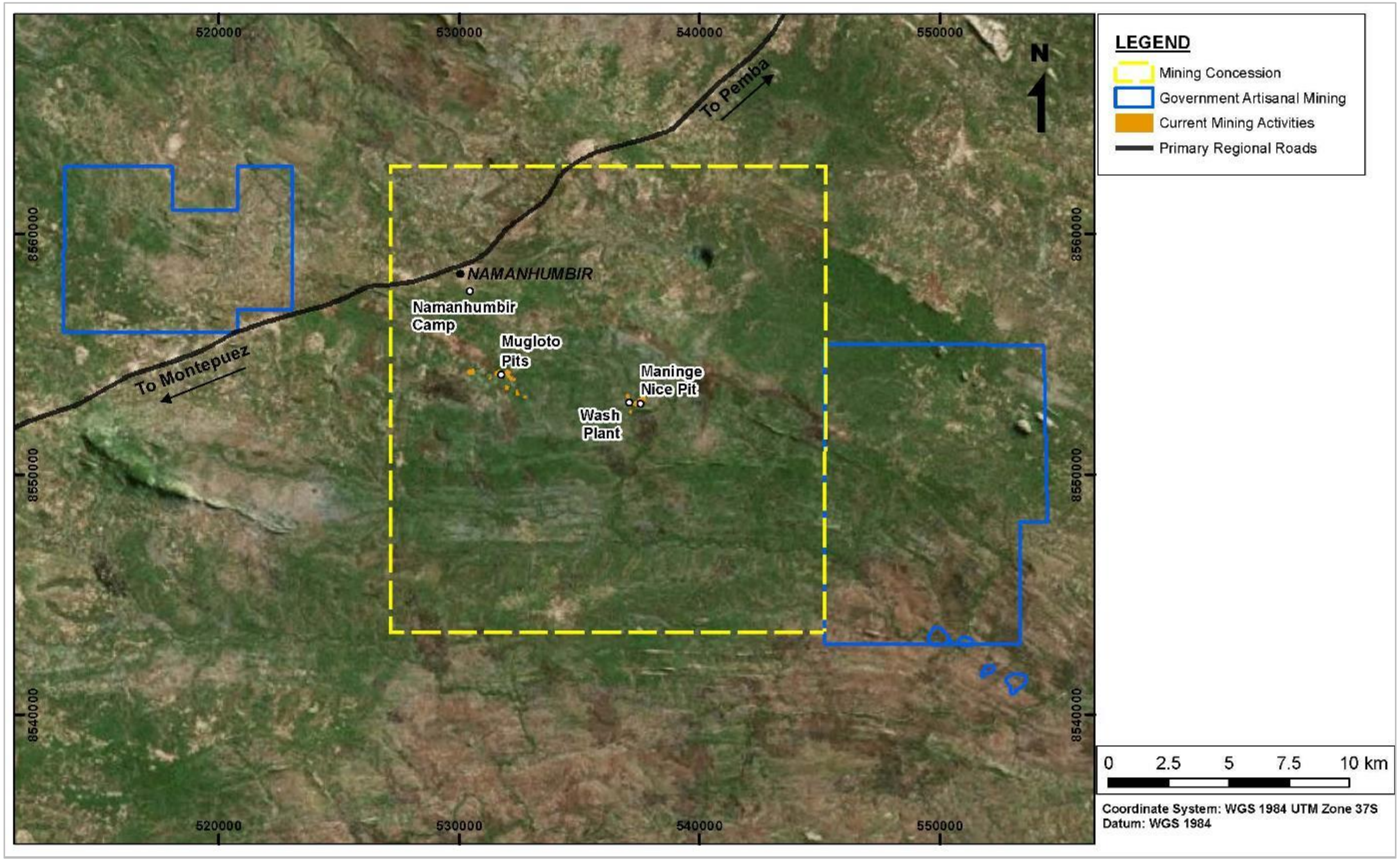

Figure ES 2: Project Setting Showing Licence

Gemstones are currently mined from a series of shallow open pits. At Present, 70% of the total rock handling production is being sourced from Mugloto Block, 25% from Glass and the remaining 5% from the Maninge nice pit. the surface infrastructure consists of the Namanhumbir mine camp as well as facilities at each of the mining areas as detailed below. The Maninge Nice mining block includes the following infrastructure:

- two open pits;
- access roads;
- a gravel washing plant;
- a stockyard for ore and overburden stockpiles;
- an engineering workshop and vehicle maintenance area;
- ruby sorting house (including security barracks);
- ware house & diesel pump station;
- CCTV control room;
- geology site office & core-shed; and
- the Arkhe security barracks.

The Glass mining areas include the following infrastructure:

- three open pits;
- Chelsea security camp; and
- a stockyard for over burden stockpiles.

The Mugloto mining area includes the following infrastructure:

- five open pits;
- overburden stockpiles;
- the Ntorro security camp including training room; and
- plantation over reclaimed pits.

SRK understands the existing workforce as at June 2017 totals 1,120 employees including 440 direct MRM employees and 680 contractors currently working with MRM.

3 GEOLOGY AND MINERAL RESOURCES

3.1 Deposit Geology

The Montepuez ruby and corundum deposit is located in north eastern Mozambique. Ruby and corundum mineralisation is found in two styles: namely, primary amphibolite, and secondary gravel beds. The main source of rubies and corundum is the secondary mineralisation, although mining has also occurred from the primary mineralisation. The current genetic model for the secondary ruby deposit proposes initial deposition within one or more major flooding events, followed by redistribution of the rubies by alluvial processes, such as those in a braided river system. The secondary gravel bed horizon comprises variably rounded quartz and clastic fragments, and forms a semi-continuous horizon, at or near the basement contact. Typically, the gravel bed horizon is generally less than 2 m thick, with an average thickness of 0.45 m. The primary mineralisation is associated with a variably weathered amphibolite unit, which is currently being mined in the Maninge Nice area.

Rubies and corundum from the primary mineralisation are typically tabular hexagonal crystals, with a strong basal cleavage. The gemstones are typically highly fractured and included, and a lighter pink in colour than those found in the Mugloto area.

Within the gravel bed unit, the quality and quantity of ruby gemstones varies significantly across the deposit. This may be a result of the variability of the primary host lithology, the geomorphology of the area, as well as the nature of the physical and chemical weathering during the transportation and deposition of the secondary mineralisation.

In the case of the Maninge Nice area (within the vicinity of the main pit Pit 3), the secondary deposit can be geochemically correlated, through XRF analysis of the trace elements, with the underlying primary amphibolite deposits. Here, the gravel bed lies very close to the primary source, resulting in a higher number of carats per tonne being recovered. The relatively short distance of transport is also indicated by the morphology of the stones, which tend to be more platy in shape reflecting the typically tabular hexagonal crystals, with a strong basal cleavage observed in the primary source. The secondary stones at Maninge Nice are also similar to those recovered from the primary sources in terms of their being highly fractured and included.

Based on XRF studies completed by Gemfields, the chemical composition of the Glass and Maninge Nice secondary deposits appear similar, however those of the Mugloto area appears to be different. Ruby / corundum stones recovered from the secondary Glass deposits are typically higher in Cr and V, and lower in Fe than those stones in Mugloto deposits. These differences in composition are interpreted to reflect a difference in primary source, which in turn is thought to be the main driver for the differences in quality of stones recovered. The chemical characteristics of the Glass and Maninge Nice secondary deposits are postulated to be correlated genetically with stones recovered from amphibolite sources.

Whilst the stones recovered for the Glass and Maninge Nice Pit 3 areas are compositionally similar, the physical nature of the stones differ. Typically, stones recovered from the Glass area indicate a higher transportation distance, are more rounded, and the number of stones recovered is reduced.

Stones recovered from the Mugloto area are relatively high in Fe content. The primary source for these stones is yet to be identified. The source is thought to lie outside the area currently delineated by exploration drilling and pitting. The stones are typically dark red in colour, more transparent' with fewer inclusions, and often rounded or tumbled in shape, which suggests a reasonable degree of transportation.

3.2 Data Quantity and Quality

MRM has been undertaking exploration and mining at Montepuez since 2012. The main sources of information include auger and diamond drilling, small scale exploration pits, bulk sampling and mining. This key data is supplemented by limited geological mapping, satellite imagery and geophysical and soil geochemistry surveys. The approximate costing of exploration completed to date is given in Table ES 1.

Table ES 1: Approximate Exploration Expenditure to August 2018 (Source: MRM)

Item	Cost (USDk)
Satellite Images	25
Drilling Rig and Accessories (Rock Drill)	300
Exploration Pitting	170
Contractual Auger/Core drilling	1,900
Airborne Geophysical Survey	300
Drone Survey	10
Boseman's Jig	50
Geological & Survey Instruments (DGPS, Total Station, GPS, Laptops etc)	155
Leica Geosystems, Permanent Base Station	50
Geological Software (Leapfrog, Surpac, Target, etc)	70
Hydraulic Drilling Rig & Accessories (Sandvik DE 710)	800
Geology Site office & Core-Shed	150
Petrographic studies	10
Exploratory Processing Unit (10tph)	200
Light Motor Vehicles	300
Total	**4,490**

The CP has not been supplied with any specific planned exploration programmes for MRM. Any further drilling is likely to be operational in nature and provided for as part of the capital provision of 0.7 MUSD per annum up to 2047. Furthermore, the CP has not been supplied with any anticipated greenfield exploration programmes which fall outside the confines of the MRM project area.

The auger drilling has been mainly used to target the secondary mineralisation with the aim of determining the thickness and nature of the gravel bed and the overlying material. Diamond drilling is predominantly aimed at determining the nature of the basement geology with the aim of defining the primary mineralisation at Maninge Nice, and understanding the bedrock geology. The main exploration tool used to determine ruby and corundum grade is through bulk sampling, and later, production.

Drilling within the Montepuez Concession Area comprises a total of 3,385 drill holes for a total meterage of 42,377 m, which comprises 2,972 auger holes and 413 diamond holes. The auger drilling is primarily on an approximate 140 m grid throughout most of the deposit, with areas of wider spaced drilling on a 200 m grid in the far west of the project and in an approximate 3 km wide area between Mugloto and Maninge Nice. A number of small pockets of close-spaced auger drilling on a 30-40m grid have been completed in the Mugloto area. The distribution of diamond drill holes is relatively sporadic and confined to the Maninge Nice area. Across the entire deposit, the auger holes are drilled to an average depth of 7.1 m, whilst the diamond holes are drilled to an average depth of 51.2 m. All diamond and auger holes are drilled vertically and have not been surveyed.

In addition to auger and diamond drilling, MRM has also conducted close spaced exploration pitting in a number of key areas. The exploration pits are shallow excavations with an average depth of 3.9 m and typical dimensions of 1 m^2 in cross section. A total of 823 exploration pits were completed between early 2012 and November 2013, for a total depth of 3,224 m. The exploration pit data is predominantly focussed on the central Mugloto and Maninge Nice areas. The pits are typically arranged in grids at a spacing of 50 m by 50 m, 100 m by 50 m or 200 m by 100 m.

MRM has implemented a logical logging and data capture procedure for diamond and auger drilling. This aims to ensure a consistent methodology for the process of capturing data, and so provide data which is suitable for the subsequent geological modelling. The CP has made a number of recommendations to MRM to improve the logging process to ensure that the most relevant data is captured in a consistent and user-friendly format.

A total of 175 of the 823 exploration pits were terminated prior to reaching the planned depth, due to various technical difficulties, and these pits have been excluded from the database for modelling, as they were considered to contain incomplete data which may bias any models generated from this data.

The only source of ruby quality distribution at the Project is the mine production records. For the period of July 2012 to the end of December 2017, approximately 14.7 Mt of material has been removed from the pits, including approximately 2.6 Mt of mineralised material. The mined material was processed through the onsite processing plant, and hand sorted to derive both the grade and quality of the contained gemstones. MRM has developed a classification scheme for the recovered gemstones, based on the size and quality of the individual gemstones.

Bulk and in situ density measurements of the top soil, clay, gravel bed and weathered basement are routinely recorded once a month in the bulk sampling and main mining pits. Density measurements are also taken routinely from the diamond core, using industry standard methodology for density determinations from diamond core. The CP notes that the density measurements are taken from core samples across the total project area, while the bulk density measurements from the bulk sampling pits are restricted to the mining areas only. The CP has used the core density measurements to derive tonnage estimates, as the core data covers a wider geographical space.

The MRM has been in production since 2012. The production data demonstrates variation in grade across the gravel bed which is influenced by occasional erratic concentrations of stones in small scale pockets and traps within the gravel bed, as is typical for such deposits. The production data also represents the primary data source in terms of quality and indicates that the proportion of premium stones recovered from Mugloto is significantly higher than the proportion of premium stones at Glass. The overall production data grade (ct/t) of the gravel bed at Maninge Nice (Maninge Nice Pit 3), which directly overlies the primary amphibolite-hosted mineralisation, is significantly in excess of the grades at Mugloto and Glass, but the proportion of premium and stones is much lower.

3.3 Mineral Resources

3.3.1 Geological Model

The auger, diamond and exploration pit data were used as the basis of the geological modelling. The secondary gravels, overburden unit and the primary bedrock lithologies were modelled. In addition, topography and top of basement surfaces were modelled.

The CP constructed a 3D volumetric model of the secondary gravel bed, based on the derivation of hangingwall and footwall surfaces from the logged auger holes and exploration pits. Between drill holes, the trend of the gravel bed footwall and hangingwall surfaces was guided by the geometry of the modelled basement contact. In areas where no gravel bed was intersected, the model pinches out to a zero thickness mid-way between holes. Due to the relatively thin average thickness of the gravel bed, and the inherent small-scale thickness variability associated with the unit, it is not possible to mine the horizon in isolation. For this reason, the mining operation chooses to mine the secondary deposits accepting significant dilution rather than risk excluding potentially mineralised material. To account for this approach a gravel bed "skin" model was created to reflect the mining dilution incorporated as part of the standard mining practice at Montepuez, based on the gravel bed model expanded by 0.3 m on in the footwall and hangingwall directions, or set to a standard 1.5 m thickness where the gravel bed model is <0.9 m thick.

The Maninge Nice amphibolite body, host to the primary mineralisation, was modelled through sectional polyline interpretations, based on logged amphibolite in diamond holes and exploration pits, cropped to the modelled basement surface.

3.3.2 Paleo Drainage Modelling

The current genetic model for the gravel bed hosted mineralisation involves initial deposition within one or more major flooding events, followed in places by redistribution / remobilisation of the rubies by subsequent alluvial processes. In order to better understand the likely distribution of major drainage channels at the time that the gravel bed was deposited, the CP completed a watershed analysis, based on the modelled basement surface. Catchments and drainage lines were delineated using Global Mapper software.

Comparison of the drainage lines with the gravel bed and grade modelling suggests that the paleo drainage channels do influence the spatial location and grade of the gravel bed. Most notably, the gravel bed appears to be present more consistently in the vicinity of the drainage channels and the modelled ruby grade (based on auger drilling and exploration pitting) is typically higher in the vicinity of the paleo drainage channels with the main areas of consistent lower grade being distal to the major channels.

3.3.3 Resource Domains

In order to appropriately reflect the variation in ruby grade and quality throughout the gravel bed in the Mineral Resource Estimate, the CP divided the gravel bed model into a total of 8 spatial domains, considered to be of similar grade and geological control. The domain outlines are largely based on the following:

- Areas of similar total ruby grade in the production pits;
- Areas of similar premium stone grade and proportion in the production pits;
- Areas of similar total ruby grade based on ruby recovery data from the auger holes and exploration pits;
- Broad division of domains based on major paleo drainage channels.

Given its distinct genetic difference the Maninge Nice primary amphibolite deposit forms a single domain.

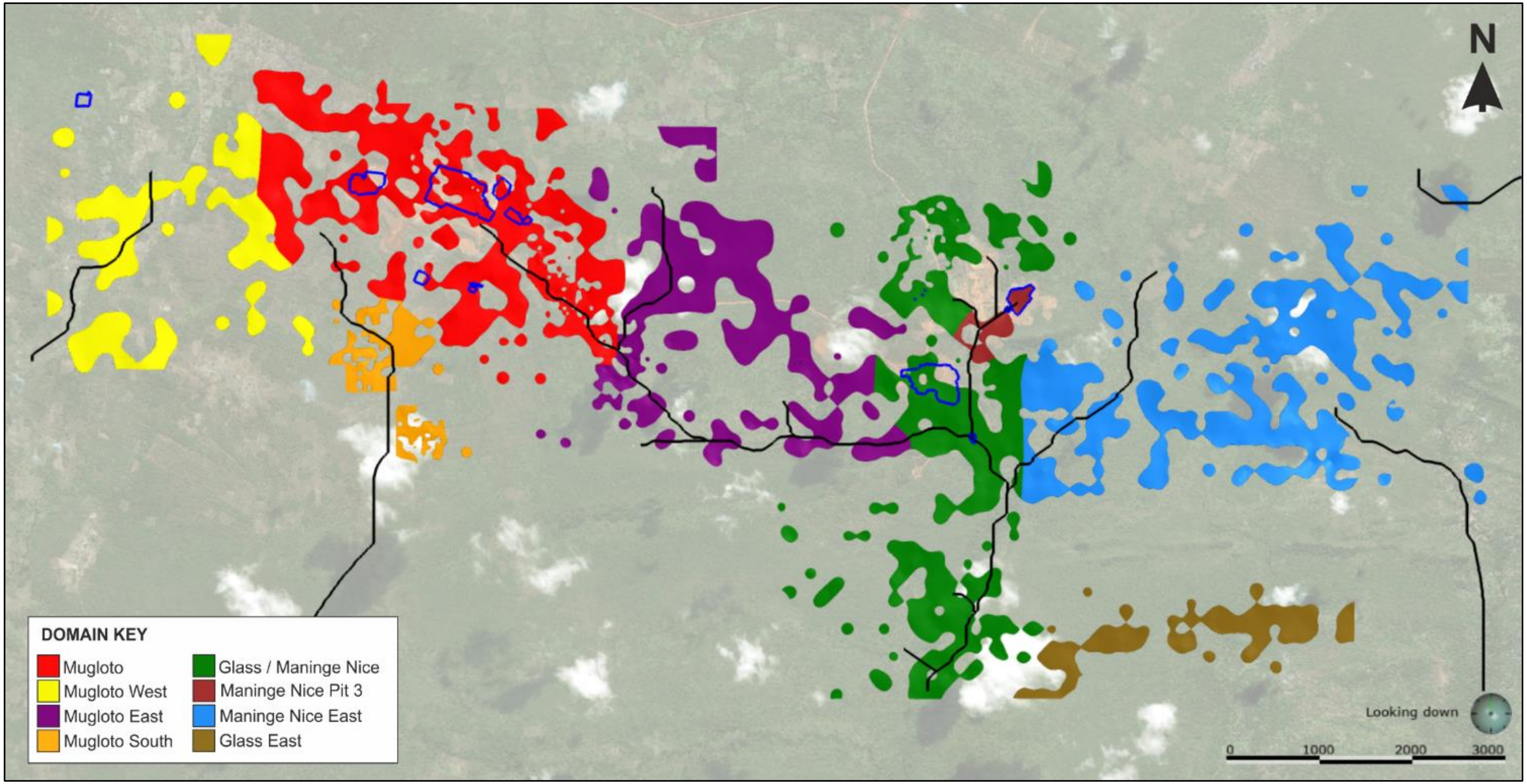

Figure ES 3: The gravel bed model, coloured by domain and shown relative to the paleo drainage channels (in black) derived from watershed analysis of the modelled basement surface. The extent of gravel bed extraction for all production pits with processed gravel bed are displayed as blue outlines.

3.3.4 Grade, Quality, and Tonnage Estimation Approach

Where available, the grades in the Mineral Resource are derived directly from the grades achieved from the ongoing production. This is the only data source which details the stone quality subdivisions of the various quality types and is also the most reliable source of grade data given the large sample size represented by each production pit.

For the secondary mineralisation it is noted that the production grades maintained by Gemfields include mining dilution which is a significant factor given the thin nature of these beds and the practise of over digging to maximise extraction. In order to convert production grades to in-situ grades the production grades were factored based on the thickness ratio of modelled gravel bed to gravel bed plus skin, considering waste as having zero grade value.

Undiluted grades and stone quality breakdown of the various stone types have been assigned to the coded gravel bed blocks in each of the modelled domains based on the following criteria:

- Within 100 m of each production pit, the gravel bed blocks have been assigned values from the corresponding production pit;
- Where a gravel bed block is within 100 m of at least two production pits, the block has been assigned values from the nearest production pit;
- Blocks more than 100 m from a production pit have been assigned average values from the pits inside the corresponding domain weighted by the production tonnage in each pit;
- For domains that do not have any production data, values have been taken from the nearest domain with available production data. In this case, the production grade from the nearest domain has been adjusted in line with how the declustered average grade from auger drilling and exploration pits in the nearest domain compares with production data in the domain under consideration;

The grade and quality breakdown for the Maninge Nice Pit 3 Amphibolite Domain has been applied based on the average production values from the amphibolite in Maninge Nice Pit 3.

To generate a tonnage estimate, the CP has applied average in situ density values to the undiluted domains coded in the block models, using values derived from the core sampling. Average density values were applied separately to the gravel bed blocks and the primary amphibolite blocks.

The block model has been depleted to account for production to date, based on the most recent Gemfields pit surveys, and also to account for exploitation by illegal artisanal miners in various areas.

3.3.5 Gemstone Quality

MRM has put in place a classification system to record the quality of the rough ruby and corundum stones recovered. These are broadly categorised into Premium Ruby, Ruby, Low Ruby, Sapphire, Corundum and -4.6 mm qualities. The number of stones recovered for each of the sub-divisions are recorded during production. As all mine planning is based on this first, broad subdivision of stones, this is how grades are presented throughout this CPR. The definition of quality categories are as follows:

- **Premium Ruby:** Any rough greater than 0.5 g in weight and of desirable shape, clarity and red colour, with no or very few inclusions;

- **Ruby:** Less than 0.5 g in weight, but of a desirable shape, clarity and red colour. Rough 0.5 g or more in weight where the rough is either included or pink in colour which affects either recovery or appearance of the finished gem;
- **Low Ruby:** Gemstones with the required pinkish red to red colour, but translucent clarity with significant inclusions;
- **Corundum:** Opaque non-gem quality rough; and
- **Sapphire:** Generally, very light pink to pink gemstones of variable shape and clarity. May contain orange and off-colour gems.

3.3.6 Assessment of ruby and corundum grade variability within the gravel bed

Analysis of the variability of ruby grade distribution within the gravel bed was completed based on ruby stone recovery data from the exploration pits and auger drilling. Statistical and geostatistical analysis was performed on the recovered ruby data in order to inform the interpolation parameters. The grades were subsequently interpolated into a block model coded to the respective domains inclusive of the skin model. The resulting model indicates a level of variation in total ruby grade across the gravel bed, with broad areas that are consistently low in grade and other broad areas that are variable, but demonstrably higher in grade throughout. As a validation check on the accuracy of the interpolated ruby grades, the CP completed a local comparison of diluted gravel bed grades in the model (i.e. the gravel bed plus the associated gravel bed skin) with the achieved production pit grades. The results of this exercise demonstrate that, in general, where the production data indicates high total ruby grades this correlate with increased grades in the block model, and vice versa. That said, despite the general correlation of grade trends, the block grades estimated from the auger drilling and exploration pits are generally significantly lower grade than the corresponding production pit grades. Because of this, and also because the auger drilling and exploration pit data only provide a total ruby grade instead of a breakdown of grade based on stone type, it is considered that the auger drilling and exploration pit ruby recovery data cannot be used to accurately estimate the Mineral Resource grade, but nevertheless they do provide a useful indication of higher and lower grade areas where production data is not yet available.

3.3.7 Mineral Resource Classification

The host mineralisation geometry has been modelled using a combination of the regional scale interpretation, in-pit mapping and drill hole, auger and exploration pit intersections. In domains which have production pits, the resource grade and premium stone proportion have been derived from production records. In domains without production pits, the resource grade and premium stone proportion are estimated using production records from neighbouring domains with grade being factored to reflect the average block modelled grade from exploration pits and auger holes in the respective domains.

In order to classify the Mineral Resources at Montepuez, the CP has taken the following factors into account:

1. quantity and quality of the underlying data and the level of geological understanding for each type of mineralisation across the property as a whole;
2. confidence in the geological continuity of the host gravel beds and primary amphibolite;
3. confidence in the grades, primarily derived from the production/bulk sampling and the understanding of the grade variation at a given production scale;

4. use of estimation domains based on watershed analysis and exploration data grade zonation, within each domain the grade and premium stone quality are interpreted to be consistent; and
5. the perceived level of risk associated with deviations from the assumptions made.

By domaining the gravel bed model, the modelled unit has been divided into zones of similar grade and geological characteristics. Classification was applied on a domain by domain basis. Indicated Mineral Resources have been defined in the Mugloto Domain, the Maninge Nice Pit 3 Domain and the Glass / Maninge Nice Domain (north of 8551200). All three domains have production data and are intersected by auger drilling and exploration pitting of a sufficient spacing to derive the outline of the gravel bed to an appropriate level of confidence. Specifically, the Mugloto Domain is tested by auger drilling on a regular grid of 140 m, with small clusters of drilling at a tight spacing of approximately 35 m, whilst exploration pitting completed in the Mugloto Domain has been completed at a spacing of 50 m. In the Glass / Maninge Nice Domain, Auger drilling is completed on a 140 m grid, with additional clusters of exploration pitting on an approximate 100 m grid. The Maninge Nice Pit 3 Domain has not been subject to any auger drilling, however exploration pitting has been completed in this domain at a spacing of between 100 m and 200 m. In addition, this domain has been subject to considerable production. The Mugloto and Glass / Maninge Nice domains are both defined by internally consistent modelled grade profiles, as identified from the auger drilling and exploration pitting, and each border a single major paleo drainage channel.

All three domains, which have been classified as Indicated Mineral Resources, have been the focus of significant production. Complete grade recovery data is available for 6 production pits in the Mugloto Domain and 3 production pits in the Glass / Maninge Nice Domain. Grade recovery data is only available for 1 production pit in the Maninge Nice Pit 3 Domain, however the production to date from this pit represents a relatively large proportion of the total domain.

Inferred Mineral Resources were defined in all other areas of the modelled gravel bed domains. Specifically, Inferred Mineral Resources have been defined in the Mugloto West, Mugloto South, Mugloto East, Glass / Maninge Nice (south of 8551200), Maninge Nice East and Glass East domains. These domains are characterised by a similar drill hole spacing to the Indicated domains. The Maninge Nice East, Glass East and Glass / Maninge Nice (south of 8551200) domains and the southern portion of the Mugloto East Domain are tested by auger drilling on an approximate 140 m grid. The Mugloto West Domain and the northern portion of the Mugloto East Domain are drilled on approximate 200 m grids. The Mugloto South Domain is primarily modelled on the basis of exploration pitting, completed on a close spaced grid of 50 m.

The primary basis for the Inferred classification of these domains is the lack of associated production data. The grade of the domains without production data have been assigned based the average production grade and quality breakdown of the nearest domain with available production data. The production grade from the nearest domain has been factored pro-rata with the auger drilling and exploration pit grades in the respective domains. The CP considers that this approach is suitable to assign grades to these domains at an Inferred confidence level.

For the primary amphibolite material, the Mineral Resources are classified in either the Indicated or Inferred category. Those areas classified as Indicated Mineral Resources are supported by relatively close spaced drilling, production data, and in-pit mapping. These aspects, in conjunction with the understanding and confidence in the geological and grade continuity, are sufficient in the CP’s opinion to support the classification of Indicated Mineral Resources, as applied. Areas which are less well supported by drilling, are classified as Inferred Mineral Resources.

In addition to the in-situ material, MRM also maintains stockpiles of both the primary and secondary mineralisation types. The stockpiles are monitored through RoM material added during production, RoM material moved from stockpiles to the processing plant, and through occasional surveying. The most recent survey completed, as provided to the CP, was end August 2018. The stockpile balances reported by MRM are based on the production data, as there is some uncertainty regarding the surveying accuracy. Stockpiles are classified as Indicated to reflect the confidence in the tonnage of the stockpiles, and the grade, and quality of the stones contained. All stockpile material is sourced from in-situ areas classified as Indicated.

3.3.8 Mineral Resource Statement

The Mineral Resource statement for the Montepuez deposit is given in Tables ES-2 and ES-3. The Mineral Resources are reported inclusive of Mineral Reserves. The statement is split into the mineralisation types (primary amphibolite and secondary gravel bed).

For reference, the Secondary Mineralisation Resources (excluding stockpiles), broken down by domain are provided in Table ES 3.

As at 31 August 2018, the Mineral Resources for the Montepuez ruby and corundum deposit, which are presented in accordance with the SAMREC Code (2016) are as follows:

- Primary mineralisation, expressed as undiluted tonnes,
  - Indicated Mineral Resources: 1,100 kt, grading at 0.003 ct/t premium ruby, 3.7 ct/t ruby, and 94.2 ct/t of low ruby, corundum, sapphire, and -4.6mm mixed ruby / corundum combined.
  - Inferred Mineral Resources: 240kt, grading at 0.003 ct/t premium ruby, 3.7 ct/t ruby, and 94.2 ct/t of low ruby, corundum, sapphire, low sapphire and -4.6mm mixed ruby / corundum combined.
- Secondary Mineralisation, expressed as diluted tonnes, to reflect the minimum mining with of 1.5m:
  - Indicated Mineral Resources: 19,500 kt, grading at 0.2 ct/t premium ruby, 0.7 ct/t ruby, and 3.1 ct/t of low ruby, corundum, sapphire, low sapphire and -4.6mm mixed ruby / corundum combined.
  - Inferred Mineral Resources: 39,800 kt, grading at 0.03 ct/t premium ruby, 0.1 ct/t ruby, and 7.1 ct/t of low ruby, corundum, sapphire, low sapphire and -4.6mm mixed ruby / corundum combined.
- Stockpiles
  - Indicated Mineral Resources: 982 kt of primary and secondary material, grading at 0.2 ct/t premium ruby, 1.0 ct/t ruby, and 10.4 ct/t of low ruby, corundum, sapphire, low sapphire and -4.6mm mixed ruby / corundum combined.

The Competent Person with overall responsibility for reporting of the Mineral Resource is Dr Lucy Roberts, MAusIMM (CP), a Principal Consultant (Resource Geology) with SRK. Dr Roberts has the relevant experience in reporting Mineral Resources on various coloured gemstone projects.

Table ES 2: Mineral Resource Statement, as at 31 August 2018, for the Montepuez ruby and corundum deposit – Secondary Mineralisation

Mineralisation Type	Classification	Density (g/cm3)	Tonnage (kt)	Premium Ruby Grade (ct/t)	Ruby Grade (ct/t)	LR+CO+SP+LS+4.6 Grade (ct/t)	Total Grade (ct/t)	Contained Carats (ct, 000)
Secondary	Indicated	2.01	19,500	0.2	0.7	3.1	4.0	78,900
	Inferred	2.01	39,800	0.03	0.1	7.1	7.3	290,100
Stockpiles - Secondary	Indicated	1.40	935	0.2	0.9	6.2	7.3	6,800
Total - Secondary	Indicated + Inferred	2.00	60,235	0.09	0.3	5.8	6.2	375,900

Note:
1 The average value of the ruby and corundum, as reported in the Mineral Resource Statement is USD17.23 /ct
2 Mineral Resource grades are quoted with a bottom cut-off stone size of 1.6mm

Table ES 3: Secondary Mineralisation Mineral Resources (excluding stockpiles) for the Montepuez ruby and corundum deposit, broken down by estimation domain.

Mineralisation Domain	Classification	Density (g/cm3)	Tonnage (kt)	Premium Ruby Grade (ct/t)	Ruby Grade (ct/t)	LR+CO+SP+LS+4.6 Grade (ct/t)	Total Grade (ct/t)	Contained Carats (ct, 000)
Mugloto	Indicated	2.01	12,600	0.3	0.9	1.8	3	37,700
	Inferred	2.01	-	-	-	-	-	-
Mugloto West	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	6,300	0.03	0.07	42	42	264,400
Mugloto East	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	9,900	0.06	0.2	0.4	0.7	6,600
Mugloto South	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	2,200	0.02	0.08	0.1	0.3	550
Glass / Maning Nice	Indicated	2.01	6,500	0.05	0.3	2.1	2.4	15,500
	Inferred	2.01	4,900	0.03	0.2	1.2	1.4	6,900
Maninge Nice Pit 3	Indicated	2.01	500	0.01	2.8	52	55	25,800
	Inferred	2.01	-	-	-	-	-	-
Maninge Nice East	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	13,300	0.02	0.1	0.7	0.9	11,400
Glass East	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	3,200	0.002	0.009	0.07	0.08	250

Table ES 4: Mineral Resource Statement, as at 31 August 2018, for the Montepuez ruby and corundum deposit – Primary Mineralisation

Mineralisation Type	Classification	Density (g/cm3)	Tonnage (kt)	Premium Ruby Grade (ct/t)	Ruby Grade (ct/t)	LR+CO+SP+LS+4.6 Grade (ct/t)	Total Grade (ct/t)	Contained Carats (ct, 000)
Primary	Indicated	2.53	1,100	0.003	3.7	94.2	97.9	107,700
	Inferred	2.53	240	0.003	3.7	94.2	97.9	23,500
Stockpiles – Primary	Indicated	1.40	47	0.003	3.7	94.2	97.9	4,600
Total Primary	Indicated + Inferred	2.49	1,387	0.003	3.7	94.2	97.9	135,800

Note:
1 The average value of the ruby and corundum, as reported in the Mineral Resource Statement is USD17.23 /ct
2 Mineral Resource grades are quoted with a bottom cut-off stone size of 1.6mm

The Mineral Resource classification applied to the deposit is illustrated in Figure ES 4, where the Indicated Mineral Resources are coloured red, and the Inferred Mineral Resources are coloured green.

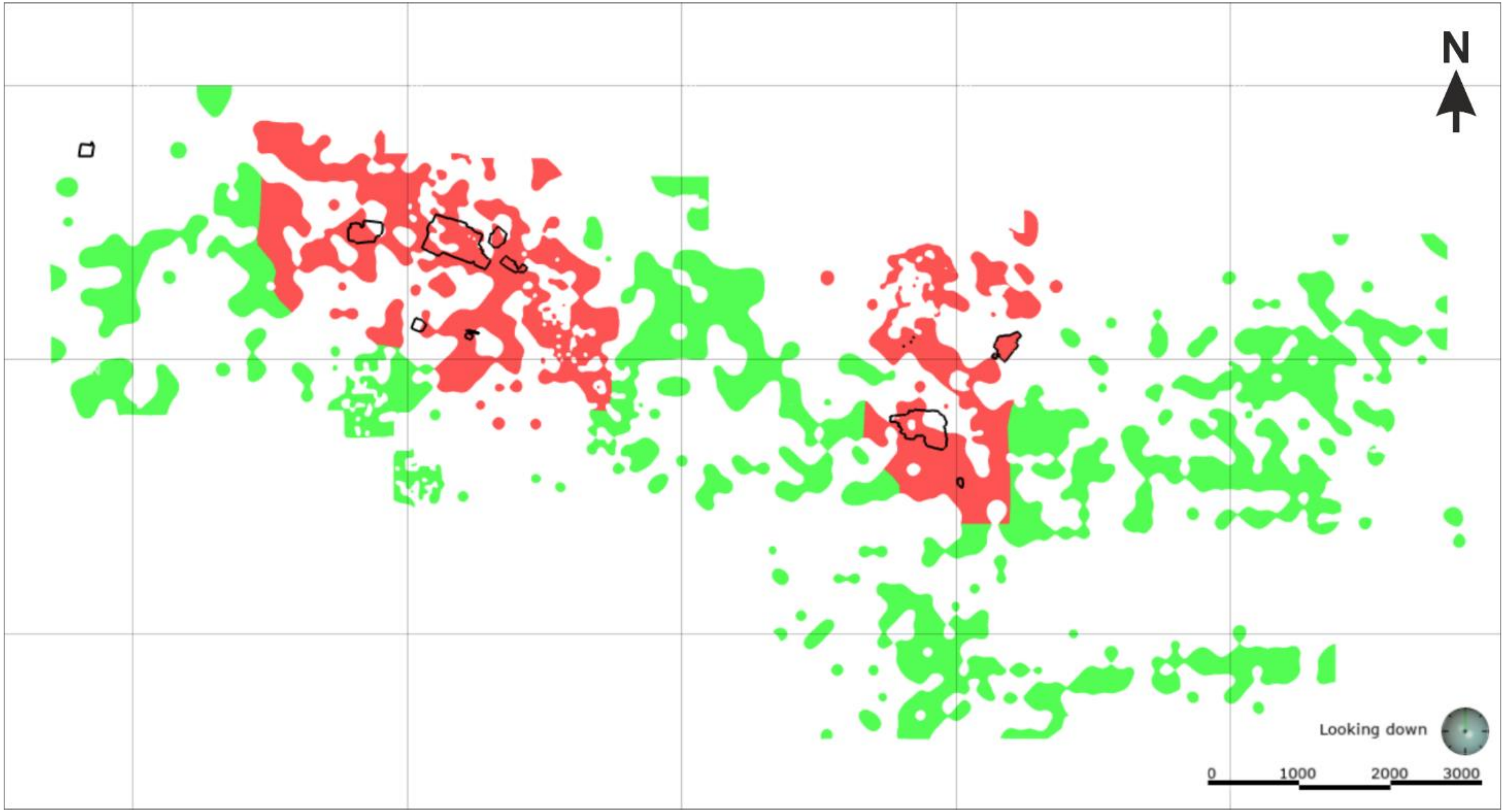

Figure ES 4 The block model coloured by classification with red = Indicated Mineral Resources and green = Inferred Mineral Resources. The extent of gravel bed extraction for all production pits with processed gravel bed are displayed as black outlines.

In presenting this Mineral Resource, the following apply:

- Mineral Resources for the gravel bed (Secondary Mineralisation) are reported inclusive of dilution to reflect the anticipated mining method, which has a minimum mining with of 1.5m, or a total of 0.6m of dilution where the gravel bed is greater than 0.9m thick;
- Mineral Resources for Maninge Nice Pit 3 Primary amphibolite are reported as undiluted;
- The CP has depleted the final block model based on the most recent pit surveys, to reflect the effective date of the Mineral Resource of 31 August 2018;
- The average value of the ruby and corundum, as reported in the Mineral Resource Statement is USD17.23 /ct. The CP notes that the price assumptions used are conservative when compared to the prices received from the auction process to date. The assumed prices for the different products, as provided by Gemfields, are as follows:
    - Premium Ruby – USD800 /ct;
    - Ruby – USD25.00 /ct
    - Low Ruby – USD1.00 /ct
    - -4.6 mm – USD2.00 /ct
    - Corundum – USD0.10 /ct
    - Sapphire – USD0.03 /ct
- Premium ruby and normal ruby are presented individually whilst other classes are combined; these comprise low ruby, corundum, sapphire, low sapphire and -4.6mm mixed ruby / corundum combined ("LR+CO+SP+LS+4.6"). A total grade for all classes is also presented for clarity;
- Mineral Resource grades are quoted with a bottom cut-off stone size of 1.6mm, which is consistent with what can be recovered in the plant, and processed in the sort house;
- Mineral Resources are quoted on a 100% attributable basis; and
- All figures are rounded to reflect the relative accuracy of the estimate. Where minor errors in summation occur, the CP does not consider these to be material.

3.4 Comparison to Previous Estimates

The JORC compliant resource statement prepared earlier in 2015 was based on exploration carried out in Mugloto and Maninge Nice sectors, measuring 32 and 4 sq km of area respectively. The entire explored area was considered as one domain each in each of the sectors for resource estimation based on the geological indices recorded, and accordingly the total Mineral Resource of 27.5 Mt was considered for Life of Mine Plan (LoMp). All Mugloto and Maninge Nice group of bulk sampling pits were inside these domains providing for the ore grade for the resource statement.

With further auger drilling carried out in adjacent Maninge Nice and Glass sectors between 2015 and 2017, the total explored area has now been extended to 77 sq km, presenting an opportunity to carry out a meaningful paleo drainage analysis of the explored area and accumulation of a host of other geological information. The geological indices superimposed on the paleo drainage pattern have facilitated in delineating eight clearly defined domains within the explored area as shown in Figure ES 3 . Out of the eight domains only four have bulk sampling pits located in them providing for the ore grade in respective domains as of resource reporting date. Accordingly, out of the total of 60.2 Mt of secondary tonnages established by exploration, only 20.6 Mt falling in these four domains was considered for life of mine planning under the SAMREC Code as shown in Figure ES 4. The rest of the secondary material (about 40 Mt) contained in the remaining four domains is expected to form part of the LoMp after adequate bulk samples are generated in each of these domains to provide acceptable grade estimates.

The CP notes that the LoMp and associated Net Present Value (NPV) have accordingly been impacted when compared to the CPR prepared in 2015. However, future bulk sampling in the remaining four domains will provide grade estimates in these areas, and potentially help in augmenting the LoMp and associated NPV.

4 MINING

4.1 Current operation

The MRM operation, comprises three main operating areas, Mugloto, Maninge Nice and Glass areas. Mining is carried out as a conventional open-pit gravel operation with excavators, loaders and trucks. Loaded trucks haul to the stockpiles at the wash plant while waste is backfilled into the mined-out areas. All material is 'free dig' with some of the harder laterite needing to be ripped by a bulldozer.

MRM currently extracts total rock at an annualised rate of 4.4 Mtpa with mined primary and secondary mineralised zones contributing 743 ktpa of ore. The associated stripping ratio is estimated at 4.8 t_{waste}:t_{ore}. At present, all ore excavation and haulage is undertaken by an MRM operated fleet which consists mainly of tipper trucks supported by excavators and bulldozers.

All run of mine (RoM) ore is stockpiled at the wash plant and a RoM stockpile with a minimum capacity of 6 months' worth of processing plant feed is kept at all times. All ore material is rehandled from the RoM stockpile.

4.2 Future operations

In its LoMp, the MRM operation will ramp-up to a full-scale production of 6.5 Mtpa total material movement by 2020. The principal targets comprise increasing the total mining capacity to 6.5 Mtpa and to achieve an annualised processing rate of 1.5 Mtpa of ore by 2019. The future LoMp will achieve an overall stripping ratio of 3.5 (t:t). The CP considers this to be achievable and appropriate for the orebody as currently defined. Additional machinery will be purchased and will provide sufficient capacity for 6.5 Mtpa.

4.3 Mineral Reserves

The CP has estimated Mineral Reserves in accordance with the SAMREC Code (2016). The level of study is based on the ongoing Life of Mine plan. The CP can confirm that the Mineral Reserve statements presented in Table ES 5 have been derived from the Mineral Resource model updated by SRK. The CP confirms that no Inferred Mineral Resources have been converted to Mineral Reserves and notes that the Mineral Resource statements reported above are inclusive of the Mineral Resources used to generate the Mineral Reserves. As at 31 August 2018, the CP notes that the Montepuez ruby deposit has Mineral Reserves, of 1,131 kt of primary material containing 110 million carats, 20,498 kt of secondary material containing 86 million carats. Economic potential associated with the Mineral Reserve statement is discussed in 5.4 and the economic viability analysis is discussed in section 12. The reserve includes material on the ROM stockpile.

Modifying Factors applicable to the derivation of Mineral Reserves have been accounted for in the Mineral Resource and mainly comprise estimates for the significant dilution as a result of the selective mining unit compared with the gravel thickness. The Modifying Factors considered by the CP to be appropriate for the secondary mineralisation is based on the greater of:

- a 0.3 m dilution skin to both the hangingwall and footwall contacts; or
- a minimum total thickness of 1.5 m. The diluting material density is 2.01 t/m^3. Owing to the application of historical factors to derive RoM grades, no dilution or other grade adjustment factors are deemed necessary for the primary mineralisation.

Table ES 5: MRM Mineral Reserve Statement

Classification	Mineralisation Type	Tonnage (kt_{dry})	Premium Ruby (ct/t)	Ruby (ct/t)	LR+CO+SP+4.6 (ct/t)	Grade (ct/t)	Contained Carats (ct, 000)
Probable							
Maninge Nice	Primary	1,131	0.003	3.66	94.22	97.88	110,709
	Secondary	526	0.013	2.85	53.71	56.57	29,744
Mugloto	Primary						
	Secondary	13,059	0.270	0.92	1.84	3.04	39,635
Glass	Primary						
	Secondary	6,914	0.053	0.29	2.10	2.45	16,927
Total Probable		21,629	0.18	0.91	8.02	9.11	197,015

Note:
1 The average value of the ruby and corundum, as reported in the Mineral Reserves Statement is USD17.23 /ct
2 Mineral Resource grades are quoted with a bottom cut-off stone size of 1.6mm
3 No Proven Reserves have been declared

5 PROCESSING

The processing of ores from the MRM deposits is relatively straight forward and involves standard industry proven mineral processing methods and equipment to recover rubies and associated semi-precious gemstones.

Initially, a small, temporary, 83 tph, process plant was set up at the site for large scale sample treatment to assess the precious gemstone content and quality of the different deposits. This plant was also used to assess the processing characteristics of the ore in terms of clay and moisture content, the amount and size of contained gravel and gemstone, and the performance of different items of equipment.

MRM has installed a new upgraded process plant including a scrubber, rated for 200 tph of fresh feed, and a dense medium separation plant (DMS), rated for 83 tph of washed -25 mm +1.6 mm material. This plant was commissioned in December 2016 and is currently operating at about 145 tph.

After washing and separation in the plant, the resulting gravity concentrate is sorted by hand. After removal of fines, the remaining gemstones are then subdivided into five broad quality categories, as discussed previously. Once split into these broad quality categories, the gemstones are further divided and subdivided into various groups based on clarity, colour, size, weight and shape.

The existing recovery house is located in a high security compound. Access to the compound and the recovery house is restricted. All sorting is currently performed manually in the high security area under strict supervision. All operations are covered by cameras.

MRM has sanctioned a new recovery house incorporating automatic colour sorting machines. This plant will be located adjacent to the wash plant to allow direct transfer of concentrate between the two operations.

A number of waste streams are produced in the plant. Coarse +25 mm material is separated and stockpiled. DMS rejects, -25 mm +1.6 mm, are removed to waste after sample testing. The -1.6 mm fraction is separated in the wash plant by screens. This material is further classified, the coarser -1.6 mm +75 µm fraction is dewatered by screen and sent to dump and the -75 µm fraction is thickened and pumped to settling paddocks where it consolidates and dries prior to transfer to permanent storage in old workings.

During the site visit, MRM advised that the amount of fine material separated from the DMS feed concentrate exceeded the capacity of sorting and that this represented a bottleneck to production. The new recovery plant is expected to overcome this bottleneck condition.

6 TAILINGS STORAGE

During the site visit MRM advised that the de-gritting and thickener circuits were undersized and were currently a bottleneck to production. The amount of fine material from the scrubber, discharge screen and the wash screen regularly exceed the capacity of the tailings circuit. The wash plant feed is managed to maintain acceptable operation of the de-grit/thickener circuit.

MRM advised that the de-grit circuit will be enhanced by replacement of the single 760 mm diameter hydrocyclone with two 450 mm diameter units, installation of a second de-grit screen and a new thickener. In context to that the new upgraded de grit unit was installed and commissioned in November 2017. With regards the new thickener, the study and sample testing is currently on going and the exact cost still unknown.

The thickener underflow (tailings) settling paddocks are located in operational mining areas. Further settling of solids occurs and any excess water is collected via temporary channels and is pumped, using a diesel powered mobile pump, back to the thickener water tank for reuse. Once a paddock has been filled, the tailings slurry is diverted to the next one. The solids in the full paddock are allowed to dry and are then excavated and trucked to a worked-out pit for final disposal.

In addition, the samples of thickener underflow have been sent to Roytec in South Africa for filtration testing. MRM advised that once these results are available the feasibility of the filtration technology will be evaluated.

7 INFRASTRUCTURE

The Project is generally well served with infrastructure. The site is several kilometres from a main highway.

Power is sourced from the national transmission grid to transformers at the camp, mine gate and wash plant. Backup diesel generators are used when the fixed connection is interrupted to ensure operations remain unaffected.

Water supply at the Mine is sourced from 8 boreholes on site which provide both potable and process water, although the bulk of process water is recycled, with boreholes providing make-up water.

8 ENVIRONMENTAL AND SOCIAL

The Mine is situated in an area with no previous history of formal mining. The discovery of gemstones in the area has brought with it an influx of artisanal miners from within Mozambique and other parts of Africa. The majority of these operate illegally.

MRM has now been actively exploring and mining for more than five years across their licence areas. In recent years, MRM has opened a number of pits and has a relatively large working area. The process plant has been upgraded and contracts have been signed for a new recovery house. In some respects, MRM is still moving from advanced exploration into full production but are addressing upgrades and improvements in a systematic manner. MRM has adopted the environmental and social management plan from the Environmental Impact Assessment (EIA) and are implementing the various recommended actions and mitigation measures. This is still work in progress.

The largest social and environmental risk to the Mine will be the implementation of the resettlement programme in two years' time. There is also some uncertainty about the ability of the Mine to meet its water demands. The water requirements are currently met from a series of boreholes on the property but there is no detailed understanding of the aquifer associated with this water supply, nor has the supply been matched with the potential increase in demand as the Wash Plant and DMS throughput increases.

MRM holds a valid approval for their Resettlement Action Plan (RAP) and was also issued a Category "A" Environmental License in October 2017 which is valid until August 2019.

The site also holds a valid:

- Land Use Permit (DUAT);
- Water Licence;
- Environmental Licence Category A; and
- Resettlement Action Plan (RAP) approval.

In addition, a number of 'lower tier' licences are also in place including; a 'borrow pit license' permitting the company to extract soil for internal roads maintenance; a bush clearing permit and an electrical licence.

Mining and processing operations are relatively simple and require minimal addition of process reagents, the only additives being ferrosilicon and flocculants. The waste products from processing are chemically benign and require no special measures for handling or storage. The process operates as a zero-discharge facility at present, so no water related impacts were apparent. There does not appear to be any capacity to manage storm events in the wet season which could lead to uncontrolled off-site discharges. MRM has put in place a management team in keeping with the expanded operations that include dedicated health, safety and environment personnel. This small team are working with the approved Environmental Management Plan (EMP) from the EIA and are in the process of developing procedures for the operation.

Environmental management at MRM consists of the following key activities:

- ensuring that water from processing operations laden with silt does not reach local water courses;
- improving oil and industrial waste management as the level of activity increases
- managing domestic waste associated with the MRM camp; and
- reclamation and rehabilitation of mined out areas.

Management of social issues at the Mine consist of:

- updating the resettlement and compensation plan and preparing for the implementation of the resettlement of the 105 families in Nthoro Village;
- providing employees with secure jobs and range of social benefits such as schooling and healthcare;
- investing in key local projects including schools, agriculture and provision of a mobile clinic; and
- working with the local authorities and police to manage the illegal miners who regularly access the MRM concession to carry out artisanal mining activities.

In consideration of all legal aspects relating to the Mine, the CP has placed reliance on the representations by the Company and MRM that the following are correct as at 1 January 2018:

- the Directors of the Company and MRM are not aware of any legal proceedings that may have an influence on the rights to explore or mine for gemstones;
- that the Company and their subsidiaries are the legal owners of all mineral and surface rights relating to the Mine; and
- no significant legal issue exists which would affect the likely viability of the Mine and/or on the estimation and classification of the Mineral Resources and Mineral Reserves as reported herein.

- It is noted however that a UK-based law firm, Leigh Day, has filed a claim in the High Court of England against Gemfields Ltd and its subsidiary, Montepuez Mining Limitada, on behalf of 29 (as yet anonymous) individuals living on or around the MRM ruby mining licence in northern Mozambique. The claim alleges that Gemfields and MRM are liable for human rights abuses including the deaths and mistreatment of artisanal miners and the seizure of land without due process. To date, the claim filed by Leigh Day has not been served on Gemfields and MRM, meaning the court process has not commenced. Gemfields and MRM are investigating the claims as far as possible, noting the Leigh Day has so far advanced very scant evidence in support of its claims. Gemfields and MRM take allegations of this nature extremely seriously and denounce any form of violence or abuse.

9 RISKS AND OPPORTUNITIES

The MRM is subject to certain inherent risks and opportunities, which apply to some degree to all participants of the international mining industry. These include:

- Commodity Price Fluctuations;
- Foreign Exchange and CPI Risk;
- Country Risk;
- Legislative Risk;
- Mineral Resource/Mineral Reserve Estimation Risk;
- Water Management Risk;
- Environmental and Social Risks; and
- Economic Performance Risk.

The principal opportunities with respect to the MRM are largely constrained to:

- Mineral Resource;
- Mineral Reserves; and
- Plant Throughput.

The risk and opportunity assessment undertaken for MRM and specifically the current LoMp and accompanying Mineral Reserves, indicates that there are opportunities to substantially increase the current Mineral Resource through further exploration. The principal risks which require management to mitigate their negative impacts are as follows:

- **Legislative and Permitting Risk.** MRM should maintain the current good relations with government to ensure permits are approved in a timely manner and to lobby for no negative changes to the mining fiscal regime.
- **Mineral Reserve Estimation Risk**. The expected variation in mined grade from month to month will require some buffering between production and sales activities. MRM has stated an intention to hold a surface stockpile next to the plant equivalent to approximately 6 to 12 month's production to meet this objective. In addition, MRM is planning to hold significant quantities of rough gemstones in secure storage facilities. The CP considers this to be adequate, but has also recommended that mining blocks are delineated with further sampling prior to mining to predict future production more accurately.

- **Water management.** Hydrogeological investigations are required to assess long-term water requirements and careful day-to-day management is necessary to ensure that zero discharge of silty water to the environment is maintained.
- **Environmental and Social Risks.** MRM has made significant efforts to maintain good relations in the local communities through a number of social initiatives. The CP considers that the approach being applied is appropriate but needs to be maintained and enhanced through to be effective in the medium to long term.

10 FINANCIAL

For the economic analysis the Competent Valuator (CV) has constructed an independent technical economic model (TEM) for the Mine. This economic analysis has been undertaken in accordance with SAMVAL to support and as part of this CPR. This CPR has been prepared to support the reporting and sign off by the CP of Mineral Resources and Mineral Reserve estimates in accordance with SAMREC Code as requested by the Client. The Client requires the CPR at the request of the JSE following the recent acquisition of Gemfields. The economic analysis is estimating the "Intrinsic Value" value of the mines Mineral Reserves and is not a market valuation of the Company.

The valuation date of the TEM is 1 September 2018. Further as this is supporting the declaration of Mineral Reserves the valuation has been prepared and presented on a 100% basis for the Mine and does not reflect the value attributable to Pallinghurst. Again, it is noted that the Mine is 75% owned by Gemfields which in turn is 100% owned by Pallinghurst.

The TEM reflects production, capital and operating expenditures and revenues from 1 September 2018 through to 2034 on an annual basis. Total ore treated over the LoM amounts to 21.6 Mt at an average grade of 9.11 ct/t. The TEM is based on the SRK teams forecast production and audited capital and operating costs based on historical figures. For the purposes of the TEM base case the CV has capped the premium content in the Mugloto Secondary area at 8% of contained carats in line with the actual achieved production over 2016 and 2017. The CV has presented a base case from a Mine perspective reflecting the full charge on mine of management and auction fees.

Under the instruction of the JSE, the CPR and TEM has been prepared from the perspective of the MRM operation. Certain cost items incurred by the mine are intercompany charges between MRM and it's major shareholder, Gemfields. These charges are shown as management and auction fees in this analysis and total 12.5% of revenue. Gemfields have stated that the effective cost of providing these services is 1.75% of revenue with Gemfields accruing the difference as revenue before tax. The CV has not independently verified this.

In addition, the TEM:

- Is based on an income approach with discounted cash flow analysis undertaken on estimated future cash flows;
  - the CV notes that a market approach was not considered due to the lack of similar comparable market transactions to allow a comparative valuation;
  - as MRM is an operating concern that has generated significant positive cashflows a cost to date approach was also not considered;
- is expressed in constant money terms;

- is presented at January 2018 money terms for Net Present Value (NPV) calculation purposes;
- applies a Base Case discount rate of 10%;
  - The CP considers a 10% discount rate to be appropriate for this type of mine within the jurisdiction it is operating. This discount rate also aligns with the Mine's WACC of 9.9%. NPV values are also presented at 8% and 12% discount rates;
- commodity prices are derived and adjusted from average prices received at auctions to date as provided by Gemfields;
- is expressed in post-tax and pre-financing terms and assumes 100% equity;
- uses a corporate tax rate of 32%; and
- includes royalties at a rate of 10% of revenue;

In respect of the commodity price, the CP has not undertaken a detailed price analysis, but has reviewed the average historical prices received from all auctions to date in six different product categories and with guidance from Gemfields has forecast prices based on actual average prices received in auctions to date in each of the categories. The two main products making up 96% of revenue are the premium ruby and ruby. The average actual price achieved for premium rubies in all auctions to date is USD1098 /ct and the lowest annual average price was in 2016 at USD803 /ct. Gemfields have advised that it would be prudent to assume a price forecast of USD800 /ct at the lower range of prices received to offset any potential risks regarding market volatility. With respect to the ruby product the price forecast is USD25/ct biasing towards the lower prices achieved in 2016.

The LoMp assumes that overall production from all sources will average an annual rate of 1,500 ktpa. Over the LoM of 16 years based on the current indicated resource, it is planned to sell 203 Mct, of which 3.6 Mct are Premium ruby, and will generate USD3,459 M in gross revenue (undiscounted). Note of the 203 Mct sales 197 Mct is from future production including the current RoM stockpile. The balance of 6 Mct comes from stock inventory. The CP has scheduled the mine plan resulting in a stripping ratio of 3.5 t:t.

Average total operating costs for the Base Case Mine perspective are estimated at USD56.81 /t treated with total operating costs amounting to USD1,229 M over the life of mine.

The total capital expenditure is estimated to be USD219 M over the LoM. Capital for engineering and mining has been estimated at USD95 M and the wash plant at USD14 M. Ongoing exploration capital is estimated at USD10 M. Sustaining capital for the on-going operations is estimated to be USD74 M. Closure costs are estimated at USD25 M.

Figure ES 3 provides an analysis of Mine cashflow over the life of mine. Table ES 4 provides a summary of the key financial parameters from the TEM.

Net present values of the cash flows are shown in Table ES 5 using discount rates from 8% to 12% in a post-tax context. The CP notes that for the Base Case from a Mine perspective, at a 10% discount rate, the post-tax NPV is USD527 M.

The Mine's NPV is most sensitive to revenue (grade or commodity price). The Mine has lower sensitivity to operating costs and is least sensitive to capital. The operating and capital cost sensitivity is illustrated in Table ES 6. Further sensitivity analysis is presented in the main report covering:

- Sensitivity to Premium Ruby Content at Mugloto Pit
- Sensitivity to Resource/Reserve Grade
- Sensitivity to Reduced Sales
- Sensitivity to Reduced Life of Mine

The Competent Valuator (CV) for this valuation is Mr Keith Joslin BEng ACSM MSAIMM, an Associate Consultant with SRK. Mr Joslin has 30 years' experience in the mining industry and has been involved in the valuation of mineral assets across many commodities during his career to date.

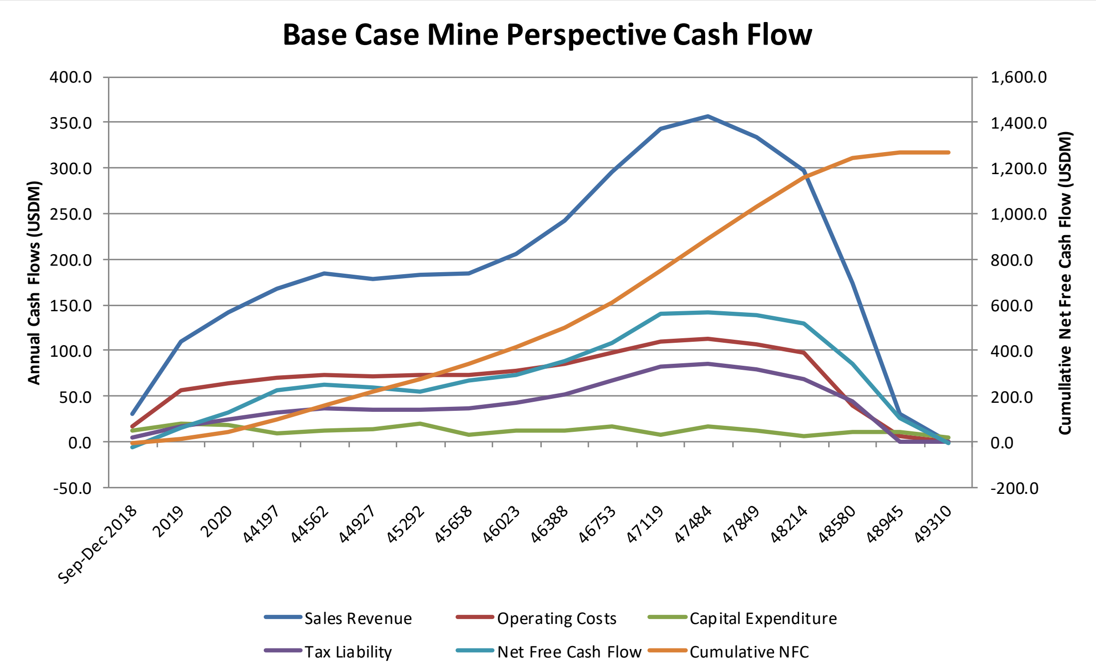

Figure ES 5: Net Cash Flow

Table ES 6: Base Case Mine Perspective Summary of LoM Financial Parameters

		Total LoM
Sales Revenue	(USDM)	3,459
Operating Costs	(USDM)	1,229
Operating Profit - EBITDA	**(USDM)**	**2,230**
Tax Liability	(USDM)	743
Capital Expenditure	(USDM)	219
Net Free Cash Flow	**(USDM)**	**1,268**
Total Waste Mined	(kt)	71,767
Total Ore Mined	(kt)	20,647
S/R	(kt)	3.48
Total Ore Treated	(kt)	21,629
Grade	(ct/t)	9.1
Contained Ct	(ct 000's)	197,015
Stock Inventory	(ct 000's)	5,633
Total Sales	(ct 000's)	202,648
Mining and production costs	(USD/t Treated)	17.02
Administrative expenses	(USD/t Treated)	3.79
Management and auction fees	(USD/t Treated)	19.99
Mineral royalties and production taxes	(USD/t Treated)	16.02
Total Operating Costs	**(USD/t Treated)**	56.81
Revenue	(USD/ct)	17.07
Operating Costs	(USD/ct)	6.06
Operating Profit	**(USD/ct)**	**11.00**

Table ES 7: NPV Profile

Summary of NPV's		Mine Perspective
	Discount Rate	NPV USDm
Net Present Value	8.0%	617
	10.0%	527
	12.0%	454

Table ES 8: Base Case Mine Perspective Sensitivity Analysis for NPV at 10%

NPV 10% (USDm)		REVENUE SENSITIVITY				
		-20%	-10%	0%	10%	20%
OPEX SENSITIVITY	-20%	445	527	608	690	772
	-10%	409	488	568	647	726
	0%	373	450	527	604	681
	10%	338	412	487	561	636
	20%	302	374	446	518	590

NPV 10% (USDm)		REVENUE SENSITIVITY				
		-20%	-10%	0%	10%	20%
CAPEX SENSITIVITY	-20%	396	473	550	627	703
	-10%	385	461	538	615	692
	0%	373	450	527	604	681
	10%	362	439	516	593	670
	20%	351	428	505	582	658

NPV 10% (USDm)		OPEX SENSITIVITY				
		-20%	-10%	0%	10%	20%
CAPEX SENSITIVITY	-20%	631	590	550	509	469
	-10%	619	579	538	498	457
	0%	608	568	527	487	446
	10%	597	556	516	475	435
	20%	586	545	505	464	424

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A COMPETENT PERSONS REPORT ON THE MONTEPUEZ RUBY MINE, MOZAMBIQUE

1 INTRODUCTION

1.1 Background

SRK Consulting (UK) Limited (SRK) is an associate company of the international group holding company, SRK Global Limited (the SRK Group). SRK has been commissioned Pallinghurst Resources Ltd ("Pallinghurst"), later renamed as Gemfields Group Limited ("GGL"), hereinafter also referred to as the "Company" or the "Client") to undertake an update of the Competent Persons Reports (CPRs) for the assets of Gemfields Plc ("Gemfields") that SRK authored in 2015. Gemfields is now a 100% subsidiary of GGL, and renamed as Gemfields Ltd. This CPR is on the Montepuez Ruby Mine ("Montepuez", "MRM", or "the Mine") in Mozambique. Montepuez Ruby Mining Limitada is the mine operator and is 75% owned by Gemfields.

SRK has been requested to base the CPR on the MRM life of mine plan (LoMp) reviewed and adjusted by SRK where appropriate. This CPR has been prepared to support the reporting of Mineral Resources and Mineral Reserve estimates in accordance with SAMREC Code.

The Lead Competent Person (CP) with overall responsibility for this CPR is Mr Mike Beare CEng BEng ACSM MIMMM, a Corporate Consultant (Mining Engineering) with SRK. Mr Beare has 23 years' experience in the mining industry and has been extensively involved in the reporting of Mineral Reserves on various diamond and gemstone projects during his career to date. The CP confirms that this Executive Summary is a true reflection of the full CPR.

1.2 Project Description

1.2.1 Location and Access

The Montepuez Ruby Mine is located in Cabo Delgado province in north-eastern Mozambique, approximately 170 km west of Pemba as presented in Figure 1-1 and Figure 1-2. The concession area is 34,996 ha. The nearest village is Namanhumbir less than 1 km from the Project camp and approximately 6.6 km from the mining areas. The main operations offices, stores and accommodation are located at the Namanhumbir camp (Figure 1-2). The camp is accessed from the highway via a 1.2 km long dirt road. The road passes through Namanhumbir from the regional Route 242 which connects Pemba and Montepuez. The road is shared with local traffic for a further 6.6 km up to the Mine gate. The Company also holds additional licences in the region, but these do not form part of this CPR.

1.2.2 Topography

MRM's concession areas are located within a relatively flat area: the average elevation is approximately 450 mRL and the highest and lowest points on the concessions are 562 mRL and 366 mRL respectively. A non-perennial tributary, originating south of the Mugloto pits, drains southwards and underlies the illegal mining area south of Mugloto. Six additional tributaries, one of which originates in the Mugloto pits area and five that originate north of the Maninge North mining area drain southwards and run beneath the illegal mining area south of Maninge Nice pits. The non-perennial tributary west of Maninge Nice pit has been dammed to create a reservoir for the wash plant.

Each of these two tributaries drain southwards from the illegal mining areas into a perennial stream that originates approximately 1 km southeast of Caraia and drains south easterly across the southern part of Mining Concession 4702C draining into the Rio Megaruma, which flows east and discharges into the Indian Ocean.

1.2.3 Climate

The climate in the Cabo Delgado is typically hot, humid and tropical with temperatures varying between 22 to 34°C. The District of Montepuez is dominated by a sub-humid and sub-arid climate. Two distinct seasons exist; the rainy season extends from November to April and the dry season from June to September. The annual average temperature is 18°C and the average rainfall is 945 mm/year. The average annual relative humidity and wind speed is 67% and 4.2 km/hour respectively.

1.2.4 Site Description

Gemstones are currently mined from a series of shallow open pits. At present, 70% of the total rock handling production is being sourced from Mugloto Block, 25% from Glass and remaining 5% from the Maninge Nice pit, a primary amphibolite deposit that extends up to 28m below surface. In addition to the Namanhumbir mine camp, the existing surface infrastructure at the Maninge Nice mining block includes:

- two open pits;
- access roads;
- a gravel washing plant;
- a stockyard for ore and overburden stockpiles;
- an engineering workshop and vehicle maintenance area;
- ruby sorting house (including security barracks);
- ware house & diesel pump station;
- CCTV control room;
- geology site office & core-shed; and
- the Arkhe security barracks.

The Glass mining areas include the following infrastructure:

- three open pits;

- Chelsea security camp; and
- a stockyard for over burden stockpiles.

The Mugloto mining area includes the following infrastructure:

- five open pits;
- overburden stockpiles;
- the Ntorro security camp including training room; and
- plantation over reclaimed pits.

Power is sourced from the national transmission grid to transformers at the camp, mine gate and wash plant. Backup diesel generators are used when the fixed connection is interrupted to ensure operations remain unaffected.

Water supply for the Project is sourced from 7 boreholes on site which provide both potable and process water. The bulk of process water is recycled, with boreholes providing make-up water.

The CP understands the existing workforce as at June 2017 totals 1,120 employees including 440 direct MRM employees and 680 contractors currently working with MRM.

1.2.5 History

The Montepuez deposits were discovered in 2009 where after there was a large influx of artisanal miners to the area. Gemfields' involvement commenced in June 2011 when a Joint Venture agreement was signed between Gemfields Plc and Mwiriti Lda, the original title holders.

Gemfields subsequently formed Montepuez Ruby Mining Lda during August 2011. In February 2012 mining concessions were issued in the name of MRM, valid for 25 years. Environmental licenses issued in the name of MRM, valid for five years were also issued in 2012.

During August 2012, bulk sampling commenced on site with a fleet of equipment purchased by MRM. The initial wash plant and sorting house were both commissioned in November 2012. The initial wash plant has now been decommissioned and a new wash plant has been constructed allowing for treatment of 200 tph and commissioned in December 2016. Following the installation of the new wash plant. MRM has decided to construct a new Sort House and recovery installation incorporating state-of-the-art hands-off sorting equipment with construction to commence in 2018. For the period of July 2012 to the end of June 2017, total rock handling was 12.6 Mt, of which 2.13 Mt was ore.

Figure 1-1: Project Location

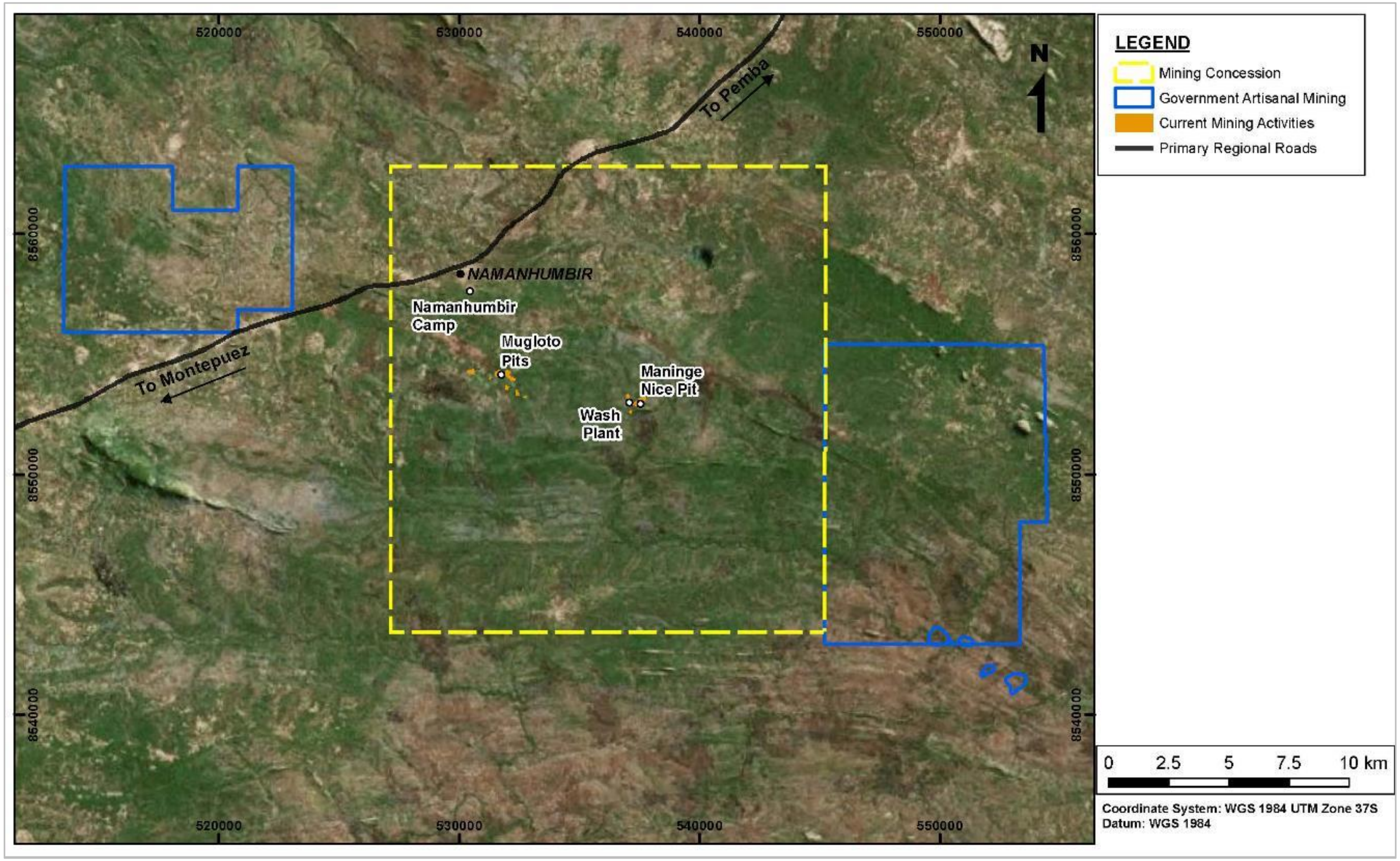

Figure 1-2: Project Setting Showing Licence

1.3 Requirement, Structure and Reporting Standard

1.3.1 Requirement

This CPR has been prepared to support the reporting of Mineral Resources and Mineral Reserve estimates in accordance with the South African Code for the reporting of exploration results, Mineral Resources and Mineral Reserves (the SAMREC Code or SAMREC). 2016 Edition.

1.3.2 Structure

The asset is limited to the Montepuez operation and the associated licences. Accordingly, this CPR has been structured on a discipline basis where technical sections comprise: Geology; Mineral Resources; Mining Engineering; Mineral Reserves; Mineral Processing; Infrastructure; Environment and Social; Commodity Prices and Macro-Economics; Technical-Economic Parameters; Risks and Opportunities; Financial Analysis; and Conclusions and Recommendations. The Company also holds additional licences in the region, but these do not form part of this CPR.

1.3.3 Compliance

In this CPR, the standard adopted for the reporting of the Mineral Resources and Mineral Reserve statements is that defined by the terms and definitions given in the SAMREC Code (2016). The SAMREC Code is a recognised reporting code and is acceptable to the Johannesburg Stock Exchange (JSE). This CPR also complies with the requirements of Section 12 of the JSE listing requirements and the SAMVAL Code.

This CPR has been prepared under the direction of the Competent Persons as defined by the SAMREC Code, who assume overall professional responsibility for the Mineral Resource and Mineral Reserve statements as presented herein.

Notwithstanding the above, the CP notes the following:

- where any information in the CPR has been sourced from a third party, such information has been accurately reproduced and no facts have been omitted which would render the reproduced information inaccurate or misleading;
- drafts of the CPR were provided to the Company for the purpose of confirming both the accuracy of factual information and the reasonableness of assumptions relied upon in this CPR;
- this CPR has not undergone regulatory review but is expected to do so as part of the listing requirements of the JSE; and
- the CP notes that gemstone deposits, owing to the distribution of economic concentrations of alluvial gravel beds are notoriously difficult to sample, estimate and classify as their thickness and grade are highly variable and their exact location very difficult to predict. Current drilling techniques are inappropriate to provide sufficient data density to enable direct estimation of gravel bed grade. Accordingly, drilling as currently employed can only provide information to determine the volume of the gravel beds. Derivation of Mineral Resources is largely dependent on the availability of the results of bulk samples or equivalent such as historical production statistics. All the above uncertainties and the use of extrapolated grade and geological information require that only an Indicated Mineral Resource category be assigned to the Mineral Resources at the Project.

1.4 Effective Date and Base Technical Information

The effective date (the "Effective Date") of this CPR is deemed to be 31 August 2018 with the Mineral Resources and the Mineral Reserves estimated at this date.

1.5 Verification, Validation and Reliance

This CPR is dependent upon technical, financial and legal input. In respect of the technical information provided, this has been taken in good faith by the CP, and other than where expressly stated, this has not all been independently verified. The CP has, however, conducted a detailed review and assessment of all material technical issues likely to influence the value of the Mine, which has included the following:

- inspection visit to the Mine during August 2014 which culminated in a report entitled "*A Review of Resource and Reserve Planning at the Montepuez Mine, Mozambique"* and dated October 2014;
- inspection visits to the Mine in April 2015;
- discussion and enquiry following access to key project technical, head office and managerial personnel from April through May 2015;
- an examination of historical information for the Mine;
- generation and reporting of a JORC Code Compliant Mineral Resource and Ore Reserve statements for the 2015 CPR;
- a review, accompanied by further site visits during September 2017 and, where considered appropriate by the CP, modification of the latest LoMp for the Mine as part of the 2018 CPR for a proposed listing on the JSE.

The CP has also assumed certain macro-economic parameters and commodity prices and relied on these as inputs to determine the potential economic viability of the stated Mineral Resources.

Where fundamental base data in support of the Mineral Resource statements has been provided (geological information, assay information, exploration programmes) for the purposes of review, the CP has performed all necessary validation and verification procedures deemed appropriate in order to place an appropriate level of reliance on such information.

1.5.1 Technical Reliance

The CP places reliance on the Company and their respective technical representatives that all technical information provided to the CP, as of 1 May 2017, is accurate. The technical representative for the Company's Mineral Resources is Mr Hemant Azad, MSc, (Applied Geology). Mr Azad is the Head of Geology at MRM and is responsible for all technical matters in respect of Mineral Resources at the Company.

1.5.2 Financial Reliance

In consideration of all financial aspects relating to the Mine, the CP has placed reliance on the Company and MRM that the following information as they may relate to the Mine and the Company is appropriate as at 1 January 2018:

- operating expenditures as included in MRM's LoMp;
- capital expenditures as included in MRM's LoMp; and

- all statutory and regulatory payments as may be necessary to execute the LoMp.

The financial information referred to above has been prepared under the direction of Mr David Lovett, Chartered Accountant (ICAEW), on behalf of the Board of Directors of the Company. Mr Lovett is the Chief Financial Officer of Gemfields and has 12 years' experience in financial operations and management.

1.5.3 Legal Reliance

In consideration of all legal aspects relating to the Mine, the CP has placed reliance on the representations by the Company and MRM that the following are correct as at 1 January 2018:

- the Directors of the Company and MRM are not aware of any legal proceedings that may have an influence on the rights to explore or mine for gemstones;
- that the Company and their subsidiaries are the legal owners of all mineral and surface rights relating to the Mine; and
- no significant legal issue exists which would affect the likely viability of the Mine and/or on the estimation and classification of the Mineral Resources and Mineral Reserves as reported herein.

It is noted however that a UK-based law firm, Leigh Day, has filed a claim in the High Court of England against Gemfields Ltd and its subsidiary, Montepuez Mining Limitada, on behalf of 29 (as yet anonymous) individuals living on or around the MRM ruby mining licence in northern Mozambique. The claim alleges that Gemfields and MRM are liable for human rights abuses including the deaths and mistreatment of artisanal miners and the seizure of land without due process. To date, the claim filed by Leigh Day has not been served on Gemfields and MRM, meaning the court process has not commenced. Gemfields and MRM are investigating the claims as far as possible, noting the Leigh Day has so far advanced very scant evidence in support of its claims. Gemfields and MRM take allegations of this nature extremely seriously and denounce any form of violence or abuse.

1.6 Limitations, Reliance on Information, Declaration, Consent and Copyright

1.6.1 Limitations

The CP is responsible for this CPR and declares that the CP has taken all reasonable care to ensure that the information contained in this report, is to the best of the CP's knowledge having made all reasonable enquiries, in accordance with the facts and contains no omission likely to affect its import.

The CP does not assume any responsibility and will not accept any liability to any other person for any loss suffered by any such other person as a result of, arising out of, or in connection with this CPR or statements contained therein.

The Company and MRM have confirmed in writing to the CP that to their knowledge the information provided by them (when provided) was complete and not incorrect or misleading in any material respect. The CP has no reason to believe that any material facts have been withheld. Further, the Company and MRM have confirmed in writing to the CP that they believe they have provided all material information.

The achievability of the LoMp and associated expenditure programme is neither warranted nor guaranteed by the CP. The LoMp and expenditure programme as presented and discussed herein has been proposed by the Company's management, and adjusted where appropriate by the CP, and cannot be assured. The LoMp and expenditure programme are necessarily based on technical and economic assumptions, many of which are beyond the control of the Company and MRM. Future cash flows derived from such forecasts are inherently uncertain and accordingly actual results may be significantly more or less favourable.

1.6.2 Reliance on Information

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

The CP's opinion in respect of the Mineral Resources and Mineral Reserves declared and the LoMp is effective at 31 January 2018 and is based on information provided by the Company and MRM throughout the course of the CP's investigations, which in turn reflect various technical-economic conditions prevailing at the date of this report. Further, the CP has no obligation or undertaking to advise any person of any change in circumstances which comes to its attention after the date of this CPR or to review, revise or update the CPR or opinion.

1.6.3 Declaration

SRK will receive a fee for the preparation of this report in accordance with normal professional consulting practice. This fee is not contingent on the outcome of the CPR and SRK will receive no other benefit for the preparation of this report. SRK does not have any pecuniary or other interests that could reasonably be regarded as capable of affecting its ability to provide an unbiased opinion in relation to the Mineral Resources or Mineral Reserve.

Neither SRK, the Competent Persons, the Competent Valuator, nor any of the directors of SRK, have at the date of this report, nor have had within the previous two years, any shareholding or other interest in the Company or MRM. Consequently, SRK, the Competent Persons, the Competent Valuator and the directors of SRK consider themselves to be independent of the Company and MRM.

This CPR 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, the CP does not consider them to be material.

1.6.4 Consent

Neither the whole nor any part of this report nor any reference thereto may be included in any other document without the prior written consent of SRK as to the form and context in which it appears.

1.6.5 Copyright

1.7 Qualification of Consultants

The SRK Group comprises over 1,300 staff, offering expertise in a wide range of resource engineering disciplines with 49 offices located on six continents. The SRK Group's independence is ensured by the fact that it holds no equity in any project. This permits the SRK Group to provide its clients with conflict-free and objective recommendations on crucial judgement issues. The SRK Group has a demonstrated track record in undertaking independent assessments of resources and reserves, project evaluations and audits, Mineral Experts' Reports, Competent Persons' Reports, Mineral Resource and Mineral Reserve Compliance Audits, Independent Valuation Reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies and financial institutions worldwide. The SRK Group has also worked with a large number of major international mining companies and their projects, providing mining industry consultancy service inputs. SRK also has specific experience in commissions of this nature.

This CPR has been prepared based on a technical and economic review by a team of 8 consultants sourced from the SRK Group's offices in the United Kingdom over a nine-month period. These consultants are specialists in the fields of geology, resource and reserve estimation and classification, open-pit mining, mineral processing, tailings management, infrastructure, environmental management and mineral economics.

The individuals who have provided input to this CPR, and are listed below, have extensive experience in gemstones and the mining industry and are members in good standing of appropriate professional institutions. Certificates of CP's, CV, and key technical staff are provided in Appendix C.

- Michael Beare, CEng, MIMMM ACSM BEng (Lead CP) (Section 1, 10 and 11);
- Hanno Buys, Pr.Eng, MSAIMM (Sections 5, 6 and 8);
- Dr Lucy Roberts, MAusIMM (CP), PhD (Sections 2, 3 and 4);
- James Haythornthwaite MSc, BSc, FGS (Sections 2, 3 and 4);
- David Pattinson, CEng, MIMMM, PhD (Sections 6,7 and 8);
- Jamie Spiers MSc DIC, BSc (Hons) (Section 7.4);
- John Merry MPhil, BSc, AIEMA (Section 9); and
- Keith Joslin MSAIMM, ACSM, BEng (Hons) (Section 12).

The Competent Person who has reviewed the Mineral Resources as reported by SRK is Dr Lucy Roberts. The Competent Person responsible for reporting Mineral Reserves is Michael Beare who also takes overall responsibility for the CPR.

In order to prepare this CPR, the following site visits were undertaken:

- 18 – 24 August 2014: Gabor Bacsfalusi and Lucy Roberts visited site in order to advise on data collection for Resource and Reserve estimation; and
- 20 - 27 March 2015: James Haythornthwaite visited site to work on the geological model;
- 30 March – 4 April 2015: David Pattinson, Rowena Smuts and Tim Fry visited site to review the processing, environmental and infrastructure disciplines. The aim of the visit was to collect project information and data, make a visual assessment and understand the current mining and processing operations for the purposes of providing guidance on environmental and social management for the Mine; and
- September / October 2017: Hanno Buys, David Pattinson, Lucy Roberts and John Merry visited site for the 2018 CPR update.

2 GEOLOGY

2.1 Regional Geology

The Montepuez deposit is located in northeast Mozambique (Figure 2-1), in the Numano block, which comprises accretionary, west-thrust faulted and highly metamorphosed Mesoproterozoic and Neoproterozoic rocks. This area forms part of the southernmost extent of the Mozambique Craton and is bound to the south by the Nampula block. The crystalline basement is overlain by Permo-Jurassic Karoo sedimentary rocks in the northwest and by Jurassic-Neogene sediments of the Rovuma Basin to the east, adjacent to the coastline. Where exposed, the basement is composed of allochthonous intrusive ortho-gneissic and para-gneissic complexes, juxtaposed along thrust-fault contacts to form separate metamorphic terranes. These terranes are separated from those to the south by the northeast-southwest trending Lurio Belt.

Metamorphism occurred during two distinct tectonic events; namely the Mozambican Orogeny (between 1100 and 850 Ma) and East African Orogeny (between 800 and 650 Ma). The basement rocks were re-tectonised and emplaced at ~538 Ma by thrusts, transcurrent shear zones and folds as part of Pan-African intracontinental orogenic processes.

The Montepuez ruby deposit is hosted by the Montepuez Complex (Figure 2-2), a strongly ductile-deformed, wedge-shaped, metamorphic terrane. The Montepuez Complex is composed of orthogneisses ranging from granitic to amphibolitic in composition, and paragneisses comprising quartzite, meta-arkose, marble lenses, quartz-feldspar gneiss and biotite gneiss. These metamorphosed sedimentary rocks have been intruded by granite, granodiorite, and tonalite.

Intense deformation has resulted in a highly complex structural framework, the local units folded into tight and isoclinal folds dissected by a suite of mainly northeast to southwest trending shear zones. The current interpretation suggests that the Montepuez Complex is structurally controlled by a complex, double plunging, re-folded fold.

The Montepuez Complex is bounded by thrust faults to the north by the Nairoto Complex, the oldest rocks in the region composed of ductile-deformed metamorphosed intrusives, and to the west by volcano-sedimentary meta-suites of the Xixano Complex.

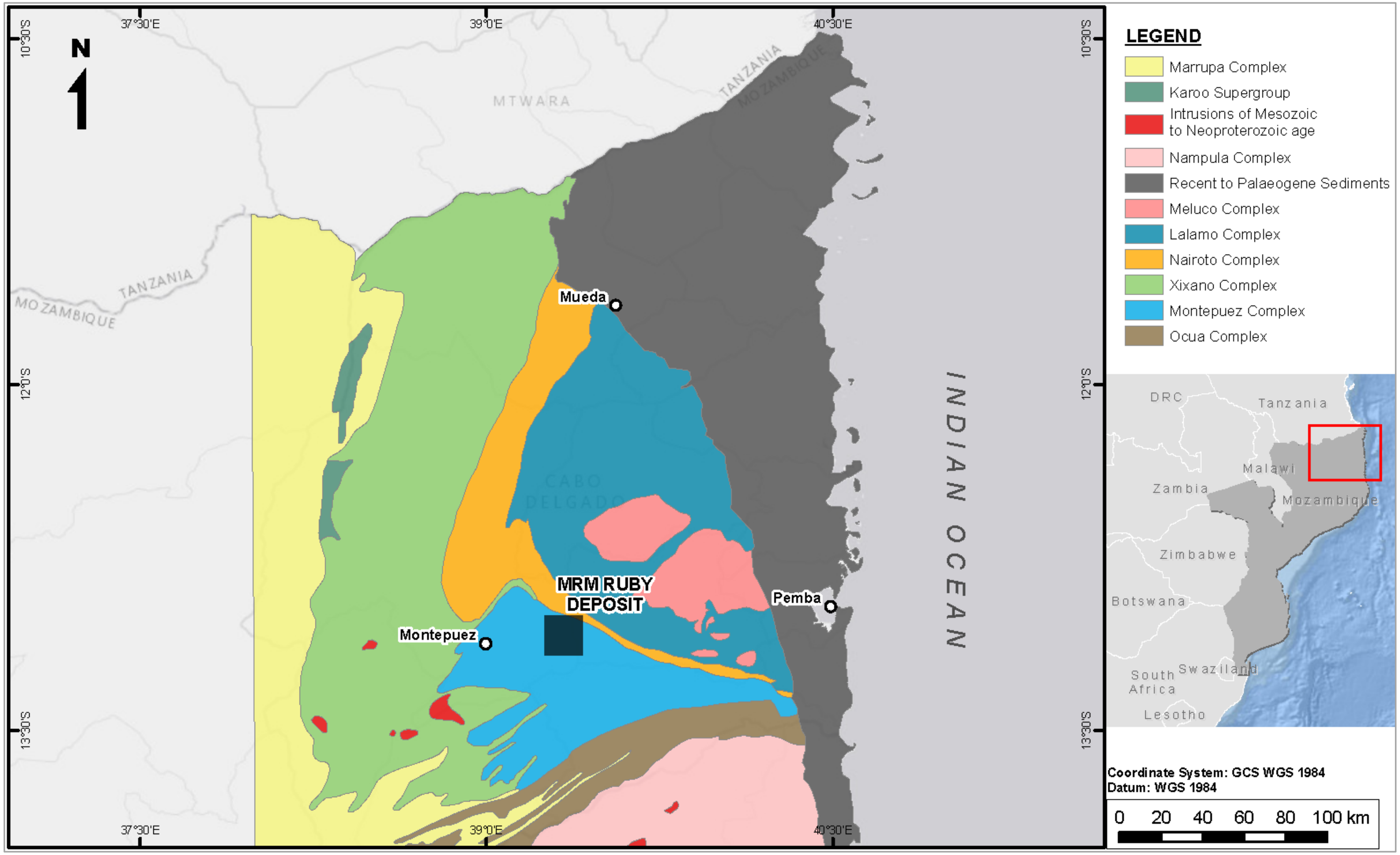

Figure 2-1: Regional geological map of Northern Mozambique

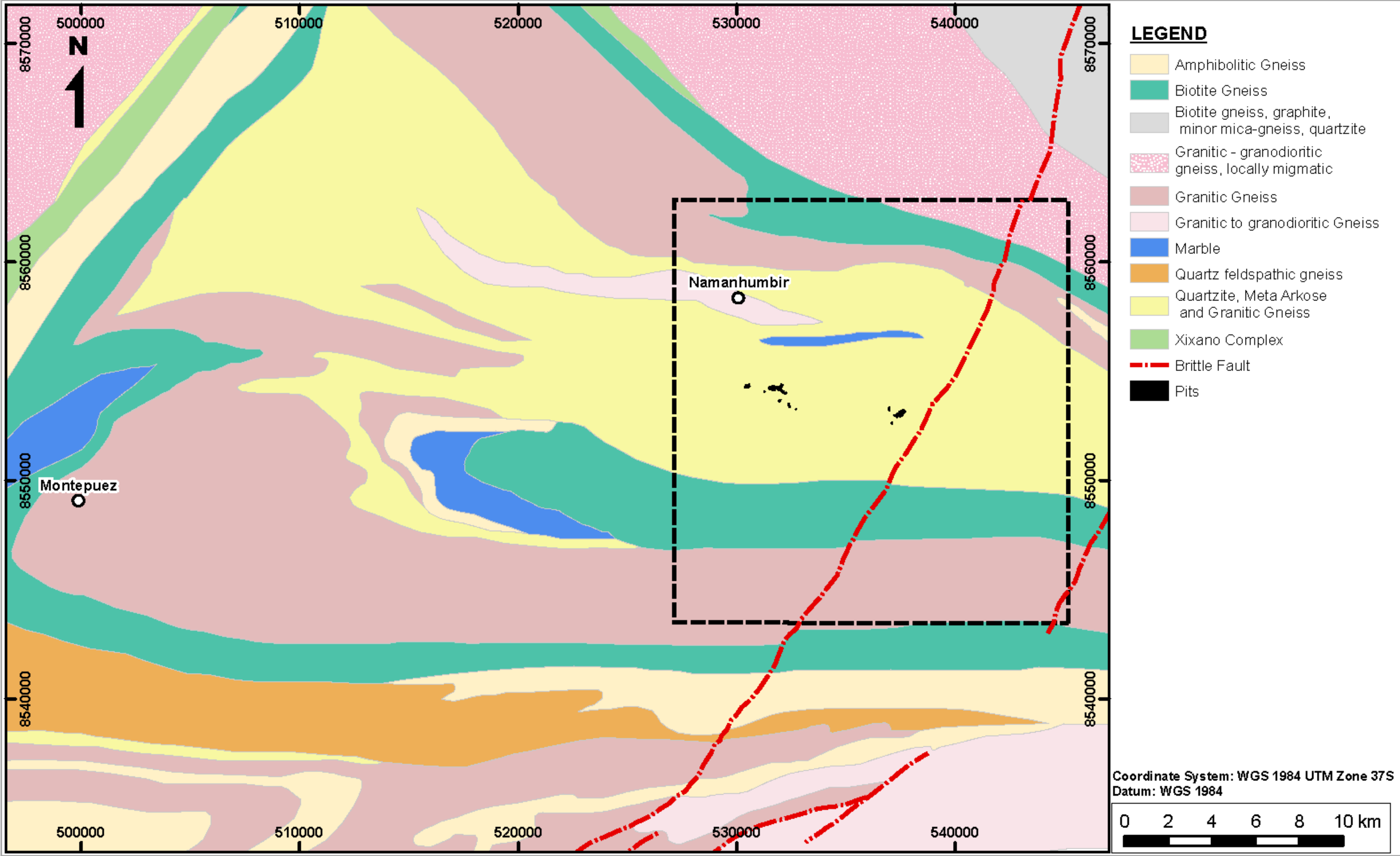

Figure 2-2: Semi-regional map of the Montepuez complex, overlain by the MRM Licence perimeter (black dashed line).

2.2 Deposit Geology

An overview of the geology and mineralisation of the Montepuez deposit is provided below. Note that, to date, mining of the ruby mineralisation by Gemfields has been primarily focussed on three main clusters of production pits in separate areas, termed by Gemfields as Mugloto (the western portion of the deposit), Maninge Nice (the north-eastern portion of the deposit) and Glass (the south-eastern portion of the deposit). These areas are referred to in describing the Montepuez geology and mineralisation presented in this section. Figure 3-4 in Section 3.8 shows the location and labels the bulk sampling pits and mining areas.

2.2.1 Lithologies

The local bedrock geology of the Montepuez deposit is characterised by a complexly deformed sequence of granitic to amphibolitic orthogneisses and carbonate, quartzite, biotite and hornblende paragneisses. This gneissic sequence may be broadly divided into four main lithological groups, namely amphibolite (Figure 2-3a), mafic gneisses, granitic gneiss and carbonate units, as described below.

Amphibolite:

A melanocratic, often gneissic unit dominated by amphibole, with lesser feldspar and mica and common garnet and/or corundum porphyroblasts. Distinct carbonate alteration of the amphibolite unit is common, manifest in intense carbonate veining, typically as mm-cm scale sub-planar veins parallel to the host rock foliation (Figure 2-3b), or less commonly as an anastomosing vein stockwork (Figure 2-3c). The carbonate altered amphibolite typically exhibits a pale colour and fine grain size relative to the unaltered equivalent. The amphibolite unit is weakly to moderately foliated and is generally characterised by a lesser degree of strain than the adjacent gneissic units.

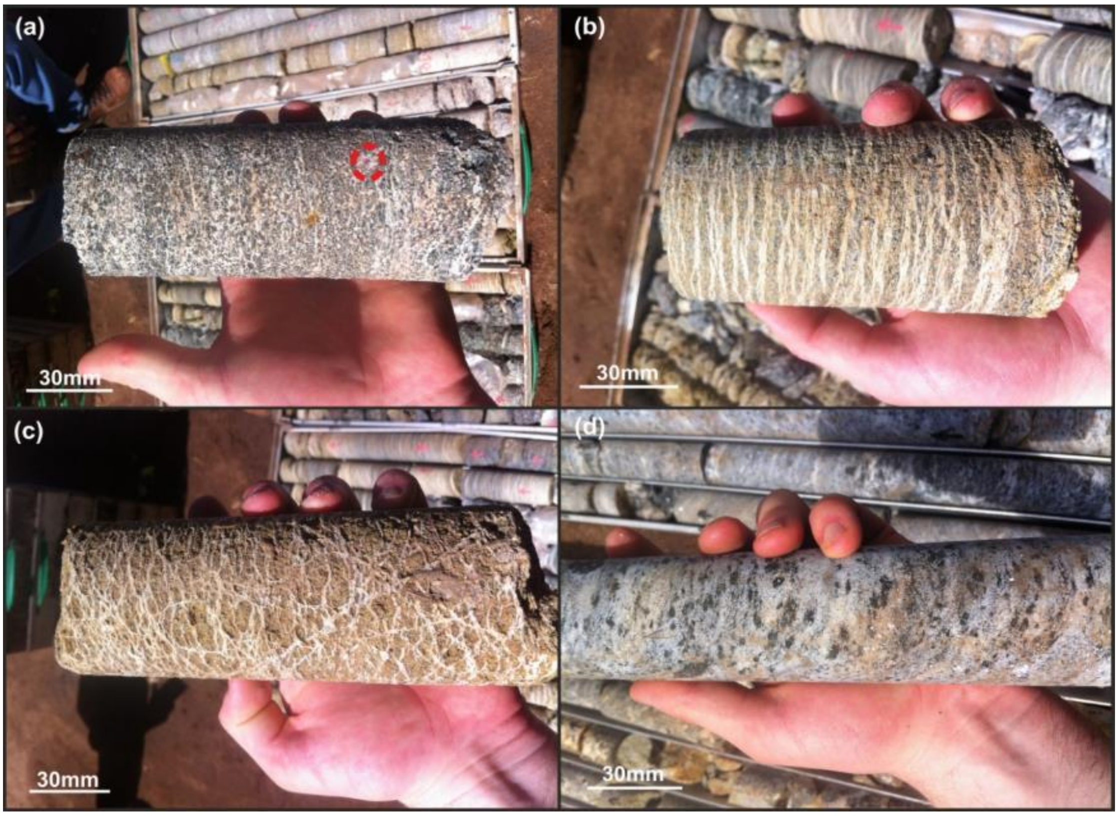

Figure 2-3: Montepuez bedrock lithologies

Notes to Figure 2-3
(from top left): a) Maninge Nice amphibolite, with visible ruby mineralisation (~2-3mm gem circled in red), b) Moderately weathered amphibolite with carbonate veining parallel to the dominant foliation, c) Highly weathered amphibolite with stockwork-style carbonate veining, d) Hornblende-biotite gneiss

Mafic Gneiss:

The bulk of the rock mass within the area of the Montepuez deposit comprises of a suite of mafic gneisses dominated by hornblende-biotite gneiss (Figure 2-3d) and biotite gneiss (Figure 2-4a). Both the biotite gneiss and hornblende biotite gneiss are composed of feldspar and quartz with an abundant mafic input dominated by hornblende and biotite, with lesser garnet and corundum. The key diagnostic differentiator between the biotite gneiss and hornblende biotite gneiss units is hornblende content, with hornblende-biotite gneiss comprising >30% of the amphibole species. Although both units are of variable grain size, the biotite gneiss is typically finer than the hornblende biotite gneiss, which is often defined by a more distinct compositional gneissic banding and characteristic clusters of hornblende porphyroblasts elongated parallel to the dominant foliation fabric. Much of the mafic gneiss suite is composed of a texturally distinct garnetiferous gneiss (Figure 2-4b) defined by abundant garnet +-/ corundum porphyroblasts in a coarse biotite or hornblende-biotite gneiss, with pronounced gneissic banding, generally at a 5 to10 mm scale.

Granitic Gneiss:

The bulk of granitic gneiss material intersected at the Maninge Nice and Mugloto areas is a massive to very weakly foliated, relatively coarse-grained unit dominated by quartz and feldspar (Figure 2-4c). Less commonly, at Mugloto, the granitic gneiss is characterised by a gneissic banding of alternating amphibole-rich and felsic bands with quartz and feldspar porphyroblasts.

Carbonate:

The carbonate material (Figure 2-4d) within the gneissic package is typically coarse grained and is often found thinly interbedded with the mafic gneiss, granitic gneiss and amphibolite units. Much of the carbonate rock commonly shares diffuse contacts with the adjacent units, and variations in colour, considered a result of minor amphibole content, or Fe alteration related to contacting amphibolite units is not uncommon.

Other Units:

Other minor lithologies observed locally in outcrop and, rarely, in drill core include quartzite, pegmatite and vein quartz. Due to their limited outcrop and drill core exposure, at present the relationship between these lithologies and the main gneissic package is unclear. For this reason, these units have not been modelled.

Figure 2-4: Montepuez bedrock lithologies

Notes to Figure 2-4
(from top left): a) Biotite gneiss, b) Garnetiferous gneiss, c) granitic gneiss, d) Carbonate

2.2.2 Overburden Sequence

The fresh bedrock units described above are overlain by up to 16 m of overburden material with an average thickness of approximately 5 m. This overburden package broadly comprises (from top to bottom) soil / lateritic material transitioning to clay rich material with increasing clastic content at depth. The contact between the clay and overlying soil is transitional and defined by increasing phyllosilicates and quartz / rock nodules. A gravel bed horizon, which comprises variably rounded quartz gravel and clastic material (up to approximately 15 cm in diameter) in a clay-rich matrix, occurs as lenses that form a semi-continuous horizon, at or near the basement contact. The gravel bed, which is the host of the secondary ruby mineralisation, is generally less than 2 m thick, with an average thickness of 0.45 m.

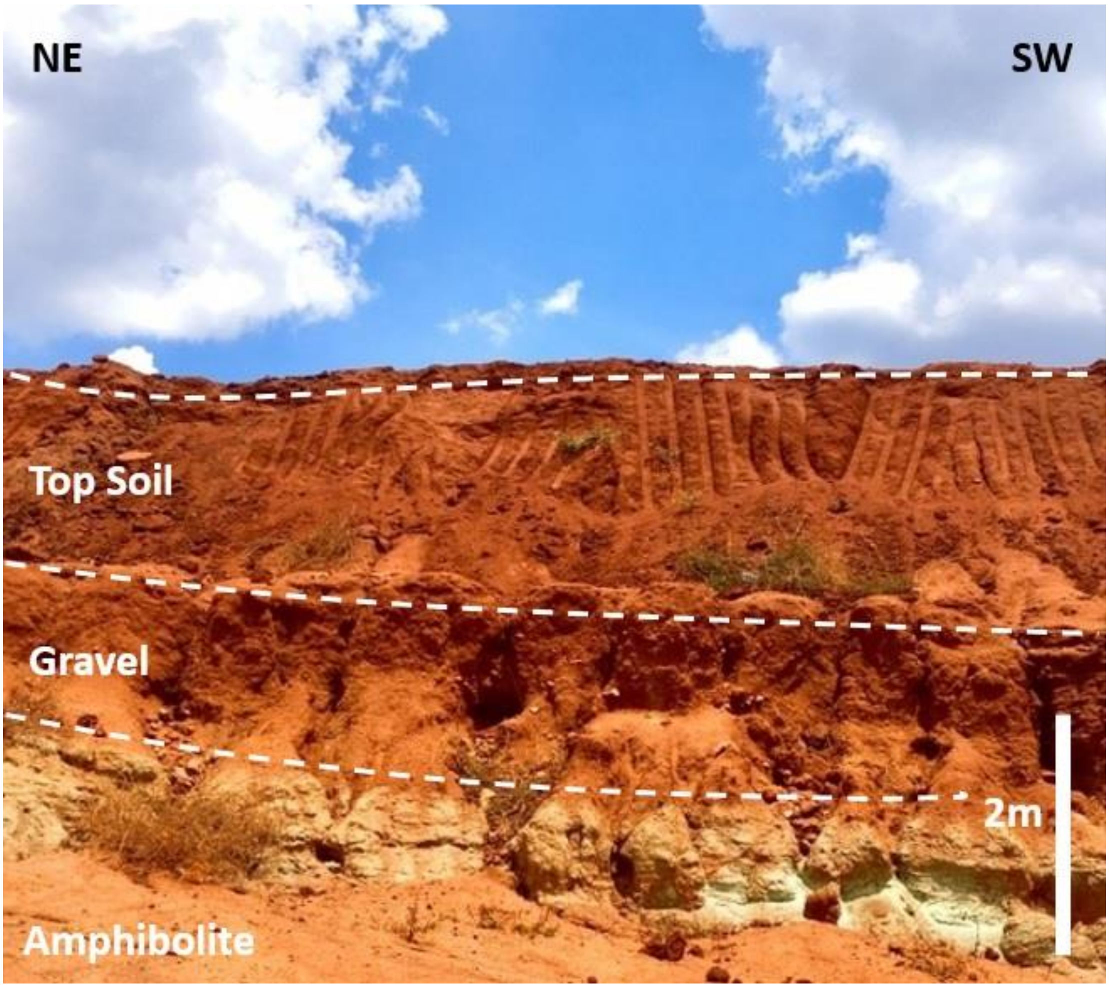

Figure 2-5: Overburden stratigraphy at the east face of Maninge Nice Pit

2.2.3 Structure and Stratigraphy

The Montepuez deposit has been subject to a complex deformation history, which is reflected in the structural complexity of the geometry of the sub-surface geological units. The gneissic sequence is variably foliated with variations in intensity from weakly to strongly foliated over distances of metres to tens of metres.

At the deposit-scale, the Montepuez deposit is interpreted to form a broadly east-west trending gentle-open fold system (Figure 2-6) with significant small-scale parasitic folding. The open folds are interpreted to form part of the northern limb of the complex, double-plunging, broadly east-west trending re-folded fold structure, as shown in Figure 2-2.

Interpretation of the available airborne geophysical survey data (magnetic and radiometric), topography and satellite data suggests that the deposit is intersected by a number of minor, discontinuous dominantly north-northwest to south-southeast trending shear zones, bounded to the south and east by larger scale east-west and north-northeast to south-southwest trending shear zones respectively.

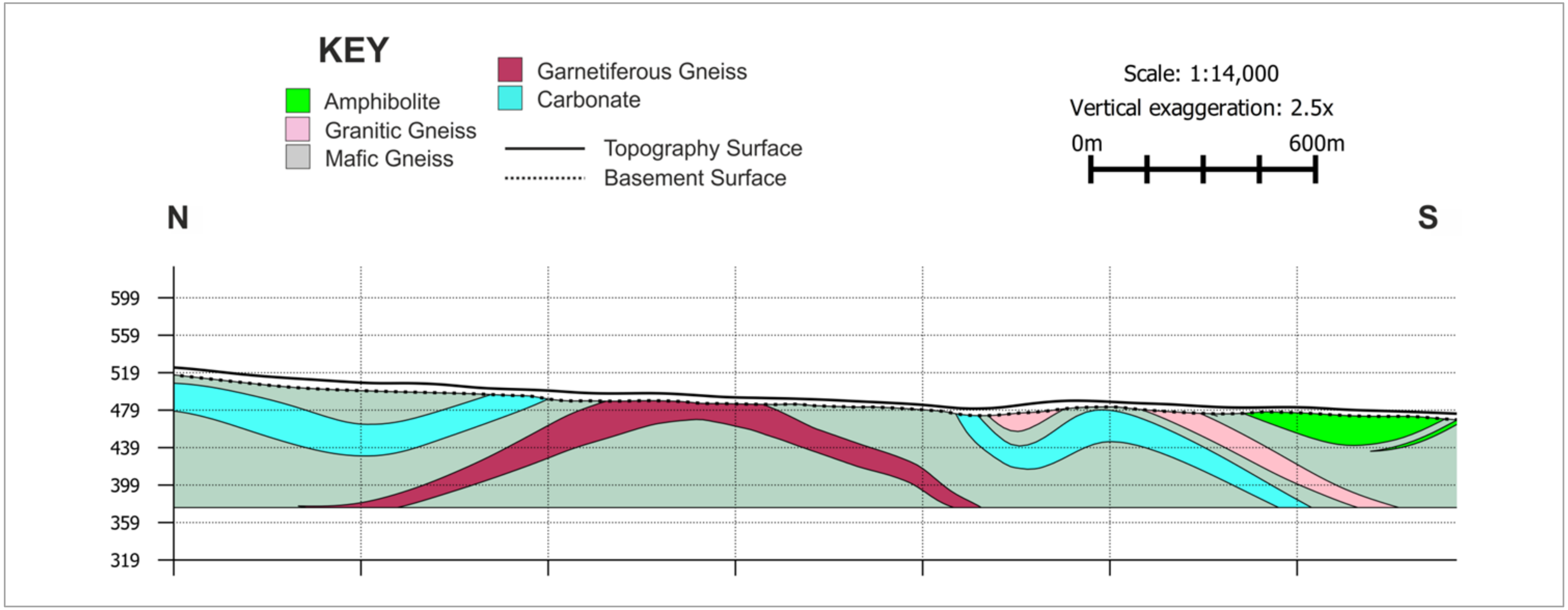

Figure 2-6: North-south section (vertical exaggeration = 2.5x) through the central Mugloto area displaying the interpreted gentle-open fold system

A broad stratigraphic sequence has been derived from the available data. In the area of the mains Maninge Nice pit, the mineralised amphibolite is underlain by approximately <10 m of folded granitic gneiss. This overlies a sequence of variably foliated mafic gneisses (biotite gneiss and hornblende-biotite gneiss) inter-layered with minor granitic gneiss intersections. A second major granitic gneiss layer, which is approximately 10 m thick, exists near the base of this sequence. To the north, coarse grained carbonate horizon outcrops in a broadly east-west orientation. This is bordered to the north by a number of discontinuous lenses of garnetiferous gneiss separated from the carbonate unit by approximately 50 to 100 m of mafic gneiss. The stratigraphic and geometrical relationship between this northern area and the gneissic sequence surrounding the Maninge Nice amphibolite is unclear. The carbonate horizon and underlying material are considered to form the northern limb of an east-west trending, downwards closing fold, with an axial plane running through the centre of the Maninge Nice amphibolite.

The stratigraphy of the Mugloto and Glass areas is not as well understood, due to a lack of diamond drilling in these areas; however, a broad sequence similar to that observed in the Maninge Nice area is apparent at Mugloto, primarily interpreted from auger drill hole logs (Figure 2-6). This is loosely defined by an amphibolite horizon, underlain by approximately 25 to 100 m of mafic gneiss, including numerous discontinuous lenses of garnetiferous material. Similar to Maninge Nice, a 10 to 50 m thick granitic gneiss horizon lies at the base of this mafic sequence. This is underlain by approximately 50 m of variably altered carbonate material, interlayered with mafic gneiss and some minor amphibolite lenses. At Glass, very broadly, the stratigraphic sequence appears to be characterised by central zone of E-W striking granitic gneiss, which occupies topographic highs, bordered by biotite gneiss, which outcrops to both the north and south of the E-W trending topographic highs, with hornblende biotite gneiss outcropping in the extreme south of the area delineated by drilling.

2.2.4 Mineralisation

Ruby mineralisation at Montepuez occurs in two settings, namely the underlying primary mineralisation, which is associated with amphibolites, and the overlying secondary mineralisation, hosted by the gravel bed. The current focus for exploration and production is the secondary mineralisation, which historically has been the source of higher quality gemstones; however, exploration and production has also targeted the primary mineralisation within the amphibolite.

Production of primary rubies has been restricted to the Maninge Nice area. Diamond drilling data suggests that primary ruby mineralisation is more abundant in this area. The primary rubies sourced from the Maninge Nice amphibolite form tabular hexagonal crystals, with a strong basal cleavage (Figure 2-7c). The recovered gemstones are typically highly fractured, and amphibole, mica and feldspar inclusions are common. Despite this, some of the primary crystals have internal clean and transparent regions that may be clipped to produce clean rough material. The primary rubies usually exhibit a lighter, pink colour, in comparison to the dark red secondary rubies, and thus most are typically classed as sapphire quality.

Where ruby mineralisation is intersected by diamond drilling, the ruby crystals are usually surrounded by a white feldspar rim (Figure 2-7a). Initial observations from the limited pit mapping suggest that the amphibolite-hosted ruby mineralisation is spatially associated with north-south trending feldspar and carbonate veins. These are considered to be related to dextral shear structures and also with stockwork-style pegmatite intrusives. Primary ruby mineralisation at Maninge Nice and Mugloto lies on the same structural trend as known ruby occurrences at Namahaca and Nacaca, which indicates the existence of a ruby rich mineralised trend. Primary amphibolite has not been identified in the Glass area by the shallow auger drilling completed in this area to date.

Secondary rubies, which are confined to the gravel bed horizon in the overburden, are typically more transparent, less included and often of a darker red colour than primary rubies in the in-situ amphibolite (Figure 2-7b and Figure 2-7d).

The current genetic model for the secondary ruby deposit proposes initial deposition within one or more major flooding events, followed by redistribution of the rubies by alluvial processes, such as those in a braided river system. Alluvial reworking resulted in the fragmentation of the more heavily included and fractured material into particle sized grains, concentrating the more durable clean material into the gravel bed deposits. As a result, the average gem quality of the secondary rubies is typically much higher than those contained within the primary amphibolite.

Figure 2-7: Montepuez primary and secondary ruby mineralisation

Notes to Figure 2-7

a) Amphibolite ruby mineralisation with a feldspar rim, in diamond drill core, b) Ruby mineralisation in the secondary gravel bed, c) Primary amphibolite ruby mineralisation at Maninge Nice, d) A comparison of the Maninge Nice primary (right) and secondary (left) mineralisation styles

Within the gravel bed unit, the quality and quantity of ruby gemstones varies significantly across the deposit. This may be a result of the variability of the primary host lithology, and will depend on the geomorphology of the area, as well as the nature of the physical and chemical weathering during the deposition of the secondary mineralisation.

MRM has put in place a classification system to record the quality of the rubies, in order to reflect this variation. This is described in detail in Section 3.8, but may be broadly categorised into Premium Ruby, Ruby, Low Ruby, Sapphire, Corundum and -4.6 mm qualities.

In the areas that have been the focus of production to date, generally, the grade (in terms of carats per tonne) is relatively similar between the Mugloto and Glass areas, although the proportion of the highest quality rubies recovered from Mugloto is greater than that at Glass. In both areas, local variation in the grade and quality of the ruby gemstones contained within the secondary gravel bed is attributed in part to varying degrees of remobilisation within the interpreted paleochannels. To date, production from the Maninge Nice area has been predominantly focussed on the gravel bed that directly overlies the primary mineralised amphibolite. Here, the total carats per tonne is an order of magnitude greater that the grades at Mugloto and Glass, but the quality of stone is typically less desirable. Production from a smaller pit at Maninge Nice, east of the main Maninge Nice pit (Pit 3) and not overlying primary mineralisation, suggests that, outside of the area directly underlain by the mineralised amphibolite, the grade and quality is more comparable to that at Mugloto and Glass.

Based on XRF studies completed by Gemfields, the primary source of the Mugloto area appears to be different from the source for Glass. Ruby / corundum stones recovered from Glass are typically higher in Cr and V, and lower in Fe than those stones in Mugloto. This difference in primary source is thought to be the main driver for the differences in quality of stones recovered.

At Maninge Nice, within the vicinity of the main pit (Pit 3), the secondary deposit can be genetically correlated with the underlying primary amphibolite deposits. Here, the gravel bed lies very close to the primary source, resulting in a higher number of carats per tonne being recovered. The distance of transport is indicated by the morphology of the stones, which, in the vicinity of Maninge Nice Pit 3, tend to be more platy in shape, indicating reduced transportation distances. The secondary stones at Maninge Nice are similar to those recovered from the primary sources, being typically tabular hexagonal crystals, with a strong basal cleavage. The stones are also highly fractured and included.

The stones recovered from Glass are similar to those at Maninge Nice Pit 3, except the secondary mineralisation does not overly the primary source. The stones indicate a higher transportation distance, meaning the number of stones recovered is reduced. The stones recovered from Glass area typically show a relatively high Cr content, a pink colour, higher V content and low Fe content than those in Mugloto and can also be correlated genetically with stones recovered from amphibolite sources.

Stones recovered from Mugloto are relatively high in Fe content. The primary source for these stones is yet to be identified. The primary source for these stones is thought to lie outside the area currently delineated by exploration drilling and pitting. The stones are typically dark red in colour, more transparent with fewer inclusions, and often rounded or tumbled in shape.

3 EXPLORATION AND DATA COLLECTION

3.1 Introduction

Gemfields exploration of the Montepuez deposit can be broadly defined in terms of two phases; namely Phase 1, completed prior to Q2 2015, and Phase 2, completed post Q2 2015. The main exploration methods being employed at the Montepuez deposit include auger and diamond drilling, small-scale exploration pits, and bulk sampling from a number of bulk sampling pits. This key data is supplemented by limited geological mapping and geophysical and soil geochemistry surveys.

Auger drilling and exploration pitting is primarily used to target the secondary mineralisation with the aim of determining the thickness and nature of the gravel bed and the overlying material. Diamond drilling is predominantly aimed at determining the nature of the basement geology with the aim of defining the primary mineralisation at Maninge Nice and understanding the bedrock geology in general. The main exploration tool used to determine ruby grade and quality is through bulk sampling. The grade and quality are determined for each mined area through recovered ruby quantity and quality data from the sorting house.

The approximate costing of exploration completed to date is given in Table 3-1.

Table 3-1: Approximate Exploration Expenditure to August 2018 (Source: MRM)

Item	Cost (USD)
Satellite Images	25,000
Drilling Rig and Accessories (Rock Drill)	300,000
Exploration Pitting	170,000
Contractual Auger/Core drilling	1,900,000
Airborne Geophysical Survey	300,000
Drone Survey	10,000
Boseman's Jig	50,000
Geological & Survey Instruments (DGPS, Total Station, GPS, Laptops etc)	155,000
Leica Geosystems, Permanent Base Station	50,000
Geological Software (Leapfrog, Surpac, Target, etc)	70,000
Hydraulic Drilling Rig & Accessories (Sandvik DE 710)	800,000
Geology Site office & Core-Shed	150,000
Petrographic studies	10,000
Exploratory Processing Unit (10tph)	200,000
Light Motor Vehicles	300,000
Total	**4,490,000**

The CP has not been supplied with any specific exploration programmes for MRM. Any further drilling is likely to be operational in nature and provided for in the capital provision of USD0.7 Mpa up to 2047. Furthermore, the CP has not been supplied with any anticipated greenfield exploration programmes which fall outside the confines of the MRM Mine.

3.2 Licenced Area

Gemfields reached an agreement with Mwiriti Limitada in 2011 to acquire a 75% controlling interest in a Joint Venture company, Montepuez Ruby Mining Limitada ("MRM"). In February 2012, the Mozambican government granted MRM a mining and exploration license for the two adjoining Mining Concessions 4702C and 4703C making up the concession area (Concession Area), which cover an area of approximately 33,600 ha. These are dated 11 November 2011 and are valid for 25 years until 11 November 2036. In 2015 an amalgamation of concessions was completed and a new concession 4703C, for an area of 34,966 ha, was issued again valid up to 11 November 2036. The Concession Area is bounded by the coordinates presented in Table 3-2. The CP notes that the licence coordinates are presented in the UTM 37 South WGS 84 coordinate system. A plan of the concession area is provided in Figure 1-2.

Table 3-2: MRM Concession Area Coordinates

Points	Easting	Southing
A	527110.42	8562850.97
B	545184.62	8562827.32
C	545152.75	8543474.13
D	527111.90	8543498.06

3.3 Topography

Previously, the highest resolution topographic data available for the Montepuez project area was the digital elevation model from the Shuttle Radar Topography Mission ("SRTM"), at a resolution of 90 mX by 90 mY, which has a fairly wide vertical accuracy range and a high-degree of smoothing.

In 2015, an airborne geophysical survey was completed by Thomson Aviation, which covered all of the licences. Currently, the highest resolution topographic data available is of airborne geophysical GeOZ-DAS Digital Data, at an accuracy of +/-0.3 m, however, the CP identified significant errors and inconsistencies between the topographic data supplied, the drillhole collars, and the ongoing operation pit surveying as completed by MRM. The CP strongly recommends that MRM address the surveying issues as a matter of priority.

3.4 Geological Mapping

Government Regional Geological Mapping:

The first programme of systematic modern regional geological mapping within a GIS framework in the area surrounding the Montepuez project was conducted by a consortium of the British Geological Survey (BGS), Norges Geolgiske Undersakelse (NGU), NorConsult AS an Eteng (NorConsult), between 2003 and 2005.

This included reconnaissance geological mapping of ten 1:250,000 scale map sheets in the provinces of Niassa and Cabo Delgado in the north of the country, bordering Tanzania. The work was part of a wider Mineral Resources Management Capacity Building Project commissioned by the government of Mozambique, with funding from the World Bank and Nordic Development Fund amongst others.

GaiaPix Photogeological Interpretation:

During late 2012 to early 2013, MRM contracted GaiaPix to conduct photogeological mapping of the Montepuez area at both regional and local scales.

A regional photogeological interpretation of the area was constructed by applying pre-existing knowledge of the regional geology of the area to the interpretation of merged Landsat ETM and SRTM data. This resulted in a 1:150,000 scale geological map, covering an area of approximately 101 km by 63 km.

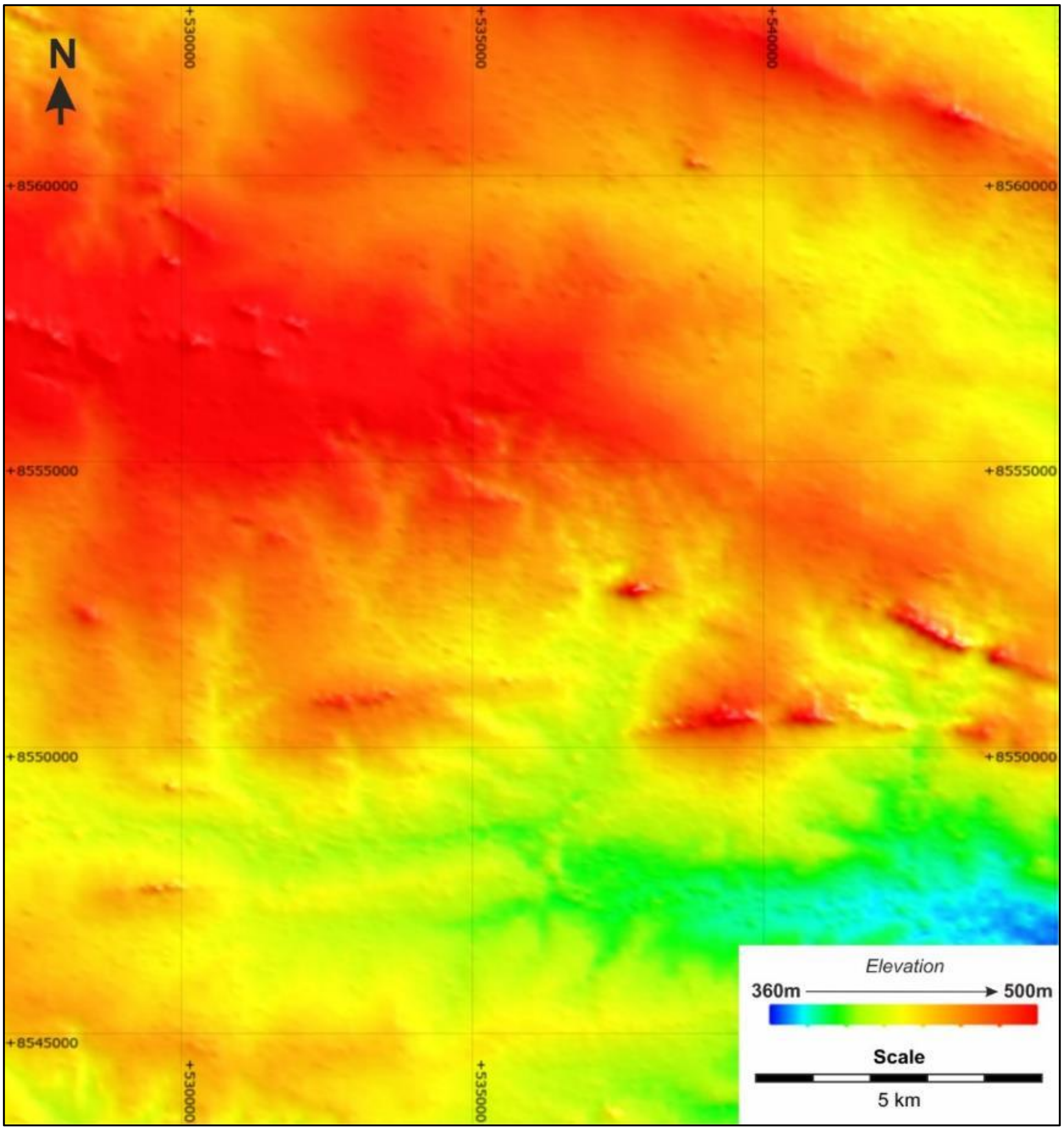

Figure 3-1: Topography surface generated from the GeOZ-DAS survey data, triangulated at a 40 m resolution.

The local photogeological map is interpreted at a scale of 1:25,000, covering an area of 19.4 km by 18 km, focussing on the Maninge Nice and Mugloto areas. The interpretation is based on SRTM data and GeoEye imagery. GaiaPix also conducted processing of regional ASTER data in order to produce regional mineral assemblage maps for illite, Mg OH carbonates, FeO, kaolin, pyrophyllite, alunite and silica. The interpretations were based on analysis of the following satellite data:

- GeoEye: high spatial resolution radiometric data at various bands within the visible and near infrared part of the electromagnetic spectrum, commissioned specifically for the Project in November 2012.
- Landsat ETM Data: multispectral radiometric data, incorporating one satellite scene with seven bands in the visible, near infrared, shortwave infrared and thermal part of the electromagnetic spectrum, and a panchromatic band of the visible spectrum.
- ASTER Data: high resolution images across 14 bands of the electromagnetic spectrum, including the visible and very near infrared, the short-wave infrared and the thermal infrared.
- SRTM Data: near-global digital elevation model data at a 90 m resolution.

In-house local mapping:

MRM has completed a number of iterations of the local geological map for the area currently delineated by drilling and exploration pitting. The area is approximately 11 km by 4 km. The MRM map is based on downhole logging data, complimented by geological and structural mapping data from limited outcrops in the north of the Concession Area. The map, which represents the key lithologies identified in MRM's downhole lithological logging database, is regularly updated as new data becomes available.

3.5 Geophysical Surveys

Terravision:

In April 2013, MRM contracted Terravision Radar (Terravision) to conduct a ground penetrating radar (GPR) survey of the Montepuez Project area. The GPR survey was completed along a number of curvilinear profiles, predominantly focussed on the area around Maninge Nice and Novo Mina. The results of the Terravision survey helped to provide an early estimation of the thickness of the overburden cover and highlighted the variation in the morphology of the basement surface. The survey also identified a number of potential local paleochannel (gravel bed) deposits and gave an early indication as to the degree of artisanal workings (identified as voids in the GPR profiles) affecting the gravel bed deposit.

Magnetic Survey:

To supplement the Terravision GPR, an electromagnetic survey was completed in April 2013, MRM purchased regional total magnetic intensity (TMI) survey data from the Council for Geoscience in South Africa, who are re-sellers on behalf of the Mozambique government. The data, which is on a 75 m grid, was later manipulated to derive a TMI analytic signal map.

In addition to the Terravision and magnetic surveys documented above, MRM also commissioned GeoEye to conduct a high resolution radiometric survey in November 2012. The results of this study were used to inform a local photogeological interpretation, which is documented in Section 4.3.

Airborne Geophysical Survey:

An airborne geophysical survey was completed between October and November 2015, which consisted of approximately 14,618 linear kilometres. The survey covered all of the licences currently held by Gemfields. The survey was flown at tree top level, to investigate the geophysical signatures, paleo-channels and structural features.

3.6 Geochemical Surveys

MRM has also completed geochemical sampling and analysis, predominantly in the area around Maninge Nice and Glass A, with a small number of additional samples taken from a small zone (600 mX by 700 mY) at Ntorro Blocks 1 and 2. In general, the sample locations follow a broad 100 mX by 100 mY grid. At each sample location, a soil sample was collected from an approximately 30 cm deep hole and stored in a zip-lock sample bag. A total of 270 samples were collected and analysed for a suite of 32 elements. Elemental analysis was conducted on site, using a handheld X-ray fluorescence analyser.

3.7 Drilling

3.7.1 Summary of the Phase 1 Drill Programme

Drilling within the Montepuez Concession Area comprises a total of 3,385 drill holes for a total meterage of 42,377 m (Figure 3-2). This includes 2,972 auger holes for 21,232 m and 413 diamond holes for 21,145 m. The auger drilling is primarily on an approximate 140 m grid throughout most of the deposit, with areas of wider spaced drilling on a 200 m grid in the far west of the project and in an approximate 3 km wide area between Mugloto and Maninge Nice. A number of small pockets of close-spaced auger drilling on a 30-40m grid have been completed in the Mugloto area. To date, no auger drilling has been completed in an approximate 750 m “buffer” west and south of Maninge Nice Pit 3, however diamond drilling has been completed in this area.

The distribution of diamond drill holes is relatively sporadic and confined to the Maninge Nice area. The most dense areas of diamond drilling are centred around Maninge Nice Pit 3, and two other small (~750 m * 250 m) pockets of dense diamond drilling in the east of Maninge Nice, where drill spacing ranges from 5 m to 75 m. North and west of Maninge Nice Pit 3, the diamond hole spacing is approximately 150m, whilst in the east of Maninge Nice (outside of the pockets of close-spaced drilling described above), diamond holes are drilled on an approximate 200 m grid.

Across the entire deposit, the auger holes are drilled to an average depth of 7.1 m, whilst the diamond holes are drilled to an average depth of 51.2 m. All diamond and auger holes are drilled vertically and have not been surveyed.

To date, all of the auger drilling and 85 of the diamond holes were drilled by the South African external drilling contractor, Equator Drilling (Equator). The Equator holes were completed using a heavy duty Sandvik DE700 core drill, specially modified with an auger drill bit attachment for auger drilling. The in-house drilling was carried out using an RD30; a simple, trolley mounted wireline rig manufactured by Rock Drill India. The majority of diamond core is drilled at HQ diameter, with a small amount of NQ diameter core.

3.7.2 Exploration Pitting

In addition to auger and diamond drilling, MRM has also conducted close spaced exploration pitting in a number of key areas Figure 3-3. The exploration pits are shallow excavations with an average depth of 3.9 m and typical dimensions of 1 m^2 in cross section. The pits were excavated prior to auger and diamond drilling to provide an initial assessment of the depth and thickness of the secondary gravel bed mineralisation. The exploration pits were excavated by manual labour and have since been filled in to avoid exploitation by artisanal workers. A total of 823 exploration pits were completed between early 2012 and November 2013, for a total depth of 3,224 m. It should be noted that a total of 200 of the 823 exploration pits were terminated prior to reaching the planned depth, due to various technical difficulties, as documented in Table 3-3.

The exploration pit data is predominantly focussed on the central Mugloto and Maninge Nice areas (Figure 3-2 and Figure 3-3). At Maninge Nice, exploration pitting is concentrated in the area around the current Maninge Nice and Glass A pits and in a square grid (approximately 700 m by 900 m). In the central Mugloto, exploration pitting is concentrated in key areas, namely extending in a north-northwest to south-southeast direction in the area surrounding bulk sampling pits 1-6, and also in a smaller zone at Ntorro blocks 1, 2 and 3. The central Mugloto pits are arranged in grids at a spacing of 50 m by 50 m, 100 m by 50 m or 200 m by 100 m.

All exploration pits were logged for geology, with “soil”, “laterite”, “clay” and “gravel bed” codes being recorded for the overburden (with corresponding interval “from” and “to” depths) and fresh rock being predominantly recorded as either “amphibolite” or “undifferentiated gneiss”. In addition, for all exploration pits completed in the Mugloto area, the extracted gravel bed was weighed, before being placed through a small, portable jig, and the total weight of any recovered rubies and any recovered garnet recorded separately. No data for the weight of the extracted gravel bed and corresponding weight of recovered rubies and garnet is available for the exploration pits completed in the Maninge Nice or Glass areas.

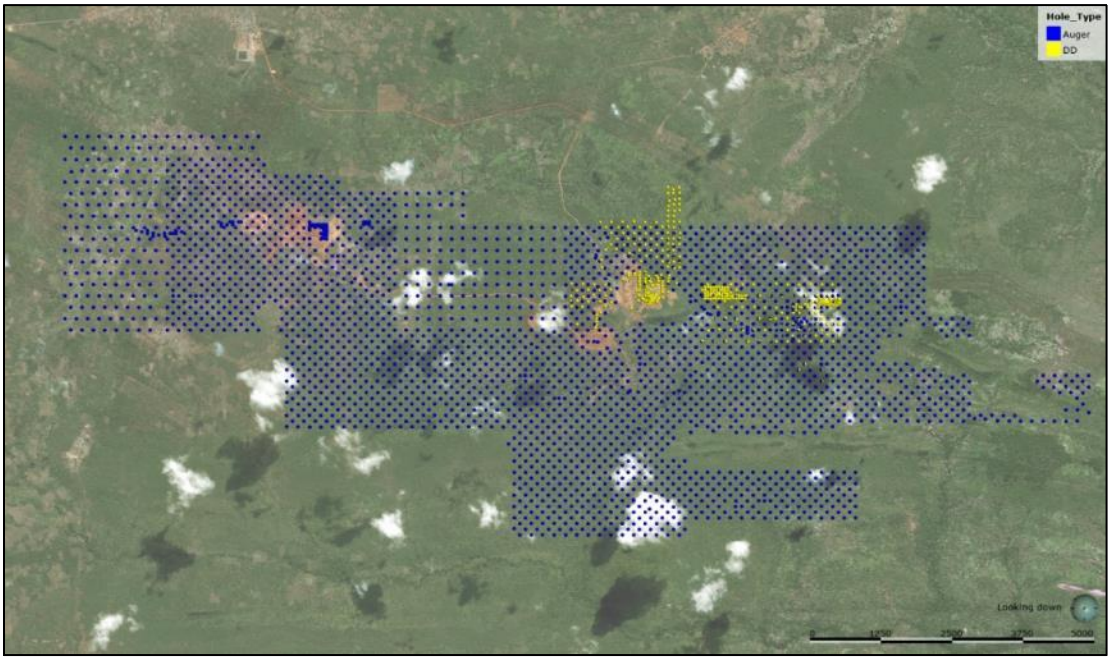

Figure 3-2: Diamond (yellow) and auger (blue) drill hole collar locations shown relative to Google Earth satellite imagery.

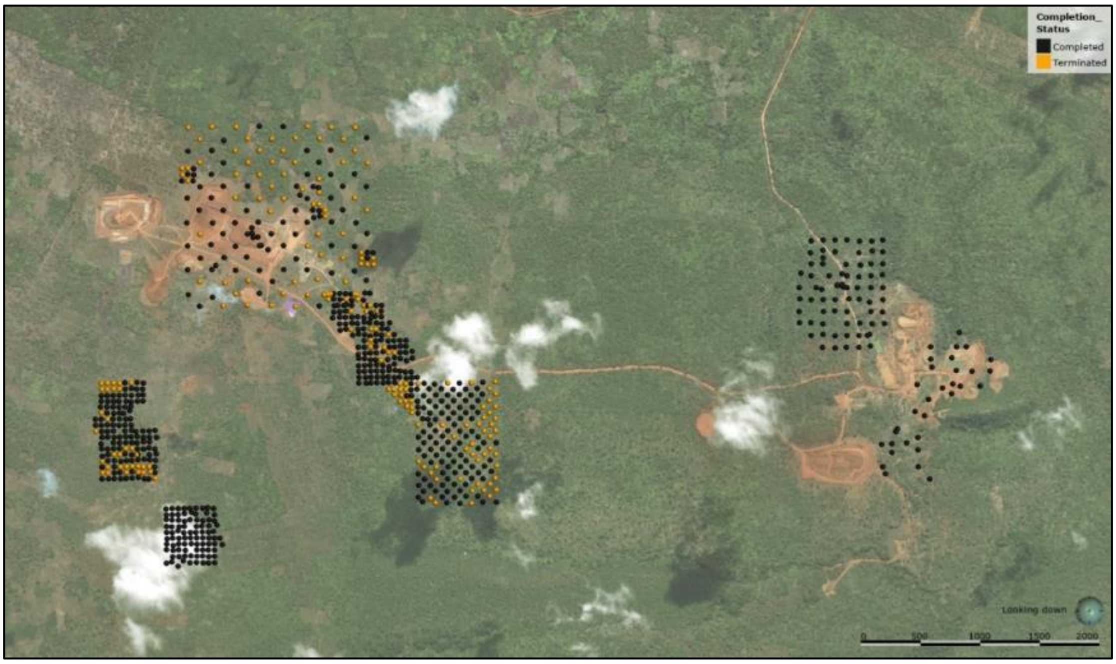

Figure 3-3: The completed (black) and terminated (orange) exploration pit collar locations shown relative to Google Earth satellite imagery.

Table 3-3: Reason for exploration pit termination

Number of pits terminated	Reason for termination
175	*Encountered inordinately hard or consolidated overburden material, preventing further excavation by manual labour*
4	*Pit collapse*
19	*Water influx*
2	*Artisanal activity*

3.7.3 Collar Surveys

All drill hole and exploration pit collars were surveyed with standard hand-held GPS equipment. The collar X and Y values in the drill hole database relate to the hand-held GPS coordinates, whilst the elevation value is taken from the SRTM topography surface.

3.7.4 Downhole Surveys and Core Orientation

To date, all auger and diamond holes at MRM have been drilled vertically. No downhole surveying has been undertaken and none of the holes have been structurally oriented.

3.8 Bulk sampling and Production

The main exploration tool used to determine ruby grade at the Project is through bulk sampling from a number of bulk sampling pits. This process was later expanded to full scale mining of the secondary mineralisation. Since mining operations began, MRM has mined both secondary and primary ruby-bearing mineralisation. Mining has occurred in three separate locations within the deposit, namely the Maninge Nice, Mugloto, and Glass areas (Figure 3-4). For the period of July 2012 to the end of December 2017, approximately 14.7 Mt of material has been removed from the pits, including approximately 2.6 Mt of mineralised material. The mineralised material extracted from the pits is passed through the wash plant (via a stockpiling system) and subsequently sorted by hand in order to provide ruby grade and quality values for each area. The minimum size of stone recovered ("bottom cut") is 1.6 mm.

At the sort house, the material recovered from the wash plant is initially split by hand into three categories, namely waste, garnet and rubies / corundum. The waste is discarded, and garnets stockpiled for future use, whilst the rubies / corundum are further split into various quality and size categories. This initially involves sieving the material to remove any gemstones less than 2.8 mm (classified as fines) and subsequently re-sieving to remove any gemstones less than 4.6 mm (classified as <4.6 mm). The remaining gemstones are then subdivided into five broad quality categories:

- **Premium Ruby:** Any rough greater than 0.5 g in weight and of desirable shape, clarity and red colour, with no or very few inclusions;
- **Ruby:** Less than 0.5 g in weight, but of a desirable shape, clarity and red colour. Rough 0.5 g or more in weight where the rough is either included or pink in colour which affects either recovery or appearance of the finished gem;
- **Low Ruby:** Gemstones with the required pinkish red to red colour, but translucent clarity with significant inclusions;
- **Corundum:** Opaque non-gem quality rough; and
- **Sapphire:** Generally, very light pink to pink gemstones of variable shape and clarity. May contain orange and off-colour gems.

Once split into these broad quality categories, the gemstones are further divided and subdivided into various groups based on clarity, colour, size, weight and shape (see Table 3-4), resulting in several hundred final subdivisions. The number of stones recovered for each of the sub-divisions are recorded during production. As all mine planning is based on the first, broad subdivision of stones, this is how grades are presented throughout this report.

Table 3-4: Premium ruby, ruby, low ruby, sapphire and corundum quality subdivisions

Ruby classification	Level 1 Subdivision	Level 2 Subdivision	Level 3 Subdivision
Premium ruby	10 grades based on clarity and colour	10 weight grades	/
Ruby (secondary material)	10 grades based on clarity and colour	10 weight grades	/
Ruby (primary material)	Three grades based on degree of inclusions	6 size grades (<5.8 mm, 5.8-8 mm, 8-11 mm, 11-16 mm, 16-22 mm, +22 mm)	Three grades based on shape (flat, normal and thick)
Low ruby	Three grades based on colour (red, red-pink, pink-red)	Three size grades (<8 mm, 8-16 mm, +16 mm)	/
Sapphire	Three grades based on clarity	Three size grades (<8 mm, 8-16 mm, +16 mm)	/
Corundum	Three grades based on colour (red, red-pink, pink-red)	Three size grades (<8 mm, 8-16 mm, +16 mm)	/

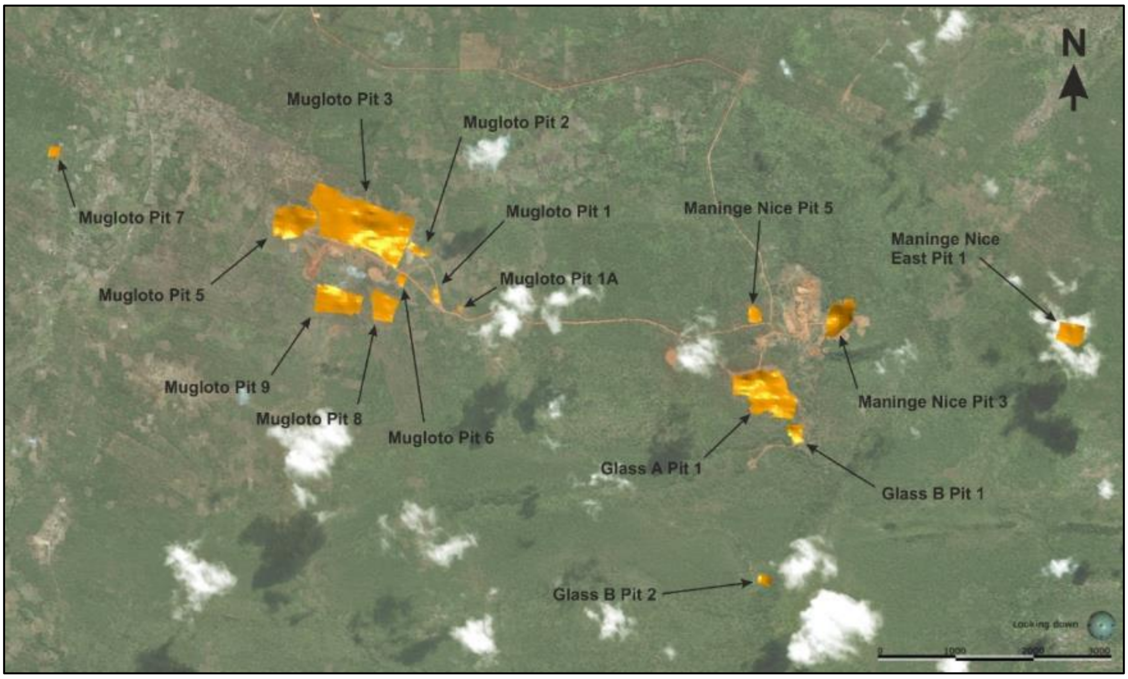

Figure 3-4: Current bulk sampling / production pit outlines in the Concession Area (excluding any historical pits since amalgamated into a single larger pit)

3.9 Data capture and storage

3.9.1 Introduction

MRM has put in place a logical logging and data capture procedure for diamond and auger drilling, to guide the on-site staff through the technical process. This aims to ensure a consistent methodology for the process of capturing data throughout the drilling campaign to allow for subsequent meaningful analysis. All logging is carried out by MRM geologists, and the CP considers the methodologies in place to be consistent with normal industry practice for this commodity type. That being said, the CP has made a number of recommendations to MRM to improve the logging process going forward to ensure that the most relevant data is captured in a consistent and user-friendly format.

3.9.2 Diamond Drilling

Core and core blocks are placed in core boxes by the geo-assistant. Upon receipt at the core shed, the drill core is cleaned or washed, if required, and core blocks are checked by MRM staff. The core is then photographed both wet and dry and a geo-assistant (Figure 3-5a).

None of the Montepuez drill core is oriented and, as such, it is not possible to draw a core orientation line onto the core. Instead, a downwards arrow is marked on the core at 20-30 cm intervals, to denote the drilling direction. Metre marks are drawn on the core once the downwards arrow has been completed. The metre marks indicate the downhole depth, taking into account the position of any core loss. All core mark-up is completed by a trained geo-assistant (Figure 3-5b).

Figure 3-5: Geo-assistant core photography (a) and core shed (b) observed during the March 2017 site visit

Subsequent to core mark-up, geological logging is carried out by an MRM geologist. Geological data is recorded in a detailed log spread sheet designed to capture key geological information for each interval. This includes lithology, mineralogy, weathering, alteration, colour, grain size, structure/texture and intrusive features including veining or minor igneous bodies. A new interval is started at each lithological contact, with a minimum logging interval length of 1 m. These are detailed in Table 3-5 and described in detail in Section 2.2.1. No samples are taken from the core, but in addition to bulk mineralogy, the presence of any key minor or trace minerals of interest, including rubies, corundum, garnet and pyrite are recorded. Any ruby mineralisation is circled in red to highlight for future reference.

Table 3-5: Montepuez diamond drill hole database lithology information

Lithological Logging Code	Number of Records (DD database)	Total Meterage (m) DD database
Soil	1,757	5,403.94
Laterite	508	1,441.46
Clay	1,341	2,633.58
Sandy with Quartz	116	216.50
Quartz Pebble	7	5.10
Gravel Bed	797	333.15
Biotite Gneiss	907	3,542.60
Hornblende Biotite Gneiss	294	2,284.25
Granitic Gneiss	70	548.10
Undifferentiated Gneiss	299	234.65m
Amphibolite	223	790.04m
Quartzite	62	79.80m
Carbonate	46	395.10m
Impure Carbonate	49	230.90m
Quartz Vein	21	15.45m
Pegmatite	22	48.30m

Basic geotechnical data including recovery and rock quality designation (“RQD”) is also recorded by a geologist or geo-assistant, alongside the geology data in the geological logging sheet. Recovery is defined as the total length of core recovered as a percentage of the run length. RQD is defined as the core recovery percentage, only incorporating pieces of solid core greater than 10 cm in length measured along the centre line of the core.

Once the drill core has been geologically and geotechnically logged, it is placed in storage for future reference.

During Phase 2 of the drilling campaign, the core recovery in the overburden sequence was significantly improved. The Company consider that the sample representation issues encountered during the drilling of the gravel bed, during Phase 1, have been significantly improved upon and that the core samples recovered in this phase do not have the same degree of “washing out” type issues as encountered previously.

3.9.3 Auger Drilling

For auger drilling, geological logging of the overburden material and the top of the weathered basement is conducted by an MRM geologist at the rig. For each 0.5 to 1 m run, the geologist assesses the overburden material to measure the depth of any contacts, before it is removed from the drill bit and placed into a tray for logging of the lithology / overburden material type.

Once logging is complete, a small representative sample (approximately 0.5 to 2 kg) is placed into a sample bag for each metre and the rest of the material is discarded. Within the gravel bed, a representative 2 kg sample is bagged for future reference, and the rest of the material is sent for washing. Drilling ceases when fresh, un-weathered rock is intersected and the drill can no longer penetrate.

At the wash plant, the gravel bed material recovered from the auger drilling is weighed, before being put through a small, portable jig. The washed material is then re-weighed and sent to the sort house to record any recovered rubies. The gravel bed sample weight, washed sample weight and recovered ruby weight is then recorded.

Figure 3-6: Auger drilling at Mugloto observed during the March 2015 site visit using a specially modified Sandvik DE700 diamond rig (a) with an auger drill bit (b)

3.10 Density

Bulk and in situ density measurements of the top soil, clay, gravel bed and weathered basement are routinely recorded once a month in the bulk sampling pits, concurrently with the mining. For determining the bulk density of the top soil or gravel bed material, the geologist selects five locations along the length of the bench, and it is heaped by the excavator. Each heap is then manually sampled into a container of known volume. For each heap, the material is transferred from the container into a poly-weave sack and transported to the Project camp for weighing.

The density of each sample is calculated by dividing the sample weight by the volume of the container. The final density is then taken as an average of the five derived density values. The in-situ density measurements are taken by hammering a metal cylinder of known volume into the desired material in the pit face. The cylinder is then rotated and removed from the face and emptied into a plastic sample bag. In the instance that the cylinder is not fully packed with material, the sample is re-taken. The sample bag is then transported to the Project camp for weighing and the density calculated by dividing the sample weight by the volume of the cylinder. This process is repeated five times, roughly equal distances apart within the selected sample area, and the final density is taken as an average of the five derived density values.

During Phase 2, density measurements were taken routinely from the diamond core. During Phase 1, the company identified some concerns regarding the sample recovery, particularly in the gravel bed sequence. During Phase 2, changes were made to the sample collection methodology, which resulted in significantly improved sample recovery. As such, the core data was considered to be a better representation of the in-situ density.

Density data is gathered from core data by wrapping the gravel bed sample in thin polythene and allowing to dry naturally. From this, a dry weight is taken. The sample is subsequently wrapped securely, placed into a container of water and the volume of displaced water measured. The density is derived using the following equation:

In-situ Density (g/cm^3) = Dry weight of sample (g) / Displaced volume of water (ml)

The CP notes that for each density measurement taken, additional information such as the weathering state, and alteration are recorded. The CP considers that as more measurements are taken, variations due to the weathering / alteration state should also be reflected in the tonnage estimation, but at the current time, there is insufficient data to draw meaningful comparisons.

The core density measurements per rock type are illustrated in Table 3-6.

Table 3-6: Summary of Montepuez density database

Lithology	Number of Measurements	Average Density Value (t/m^3)
Amphibolite	108	2.53
Amphibolite/Impure Carbonate	2	2.71
Biotite Gneiss	580	2.83
Carbonate	109	3.06
Feldspathic Intrusion	7	2.61
Phlogopite	1	2.13
Granitic Gneiss	176	2.93
Gravel bed	35	2.12
Hornblende Biotite Gneiss	205	2.92
Impure Carbonate	2	1.71
Laterite	273	1.92
Mineralized Amphibolite	19	2.44
Pegmatite (1)	2	2.94
Pegmatite (2)	1	1.91
Pegmatite Intrusion	3	2.74
Quartz Vein	6	2.81

The CP notes that the density measurements recovered from core samples cover the total project area, while the bulk density measurements are restricted to the mining areas only and were reportedly based on samples that were not thoroughly dried. For this reason, the CP has used the drill core density measurements to derive the tonnage estimates presented in Section 4.8, as described in Section 4.5.3, as the core data covers a wider geographical space. In addition, the changes made to the diamond drilling since Phase 1 mean that the samples recovered are now more representative of the gravel bed as a whole.

4 MINERAL RESOURCES

4.1 Deposit Modelling

The Montepuez geological model comprises two constituent parent domains relating to the differing styles of ruby mineralisation observed, namely the gravel bed host to the secondary mineralisation, and the amphibolite hosted primary mineralisation. The following section describes the modelling methodology applied to the two mineralisation styles.

4.1.1 Gravel Bed

Prior to constructing the gravel bed model, a basement surface wireframe, representing the base of the overburden material, was modelled. This was generated from the logged base of overburden in all auger holes and exploration pits. The basement surface, which is interpreted to represent the paleotopography at the time of the gravel bed deposition, forms the framework to guide the gravel bed model.

The gravel bed model was directly based upon logged gravel bed intersections in the auger holes and exploration pits. The CP ignored the terminated exploration pits (see Section 3.7.2) during this phase of modelling. The CP reviewed the exploration pits, and identified that, of the 200 exploration pits marked as "terminated", 17 include either logged gravel bed or logged fresh rock. These 17 pits were re-coded as "completed" and incorporated into the gravel bed model.

After careful analysis, it was decided that the results of the diamond drilling should not be used when generating the basement surface model, or in constructing the gravel bed volume. This is due to local inconsistencies in the logged depth of the basement when comparing diamond holes with proximal auger holes / exploration pits. On average the logged gravel bed thickness in the diamond drill database (0.27 m) is significantly less than that in the auger drilling / exploration pit logging (0.45 m). It is considered that the differences in logging of the overburden and gravel bed in the diamond holes, relative to the auger holes and exploration pits, may be a result of "washing out" of the gravel bed during the wet diamond drilling process. Based on this, coupled with the local inconsistencies in the depth of the basement between the two datasets, the CP decided to ignore the diamond drill hole data in constructing the gravel bed, as per previous model iterations.

To construct the gravel bed model, hangingwall and footwall surfaces of the gravel bed horizon ("GB") were generated from the logged gravel bed intersections in the auger holes and exploration pits. Between drill holes, the trend of the footwall and hangingwall surfaces was guided by the geometry of the basement model. A 3D solid was then generated between the modelled hangingwall and footwall surfaces. In areas where no gravel bed was intersected, the model pinches out to a zero thickness mid-way between holes with and without logged gravel bed.

The gravel bed model is displayed in Figure 4-1 and Figure 4-2. The modelled thickness ranges between 0 to 3.5 m. Gravel bed thickness is variable throughout the deposit, although the gravel bed at Maninge Nice is typically thicker on average than elsewhere, whilst the area of gravel bed between Maninge Nice and Mugloto is generally the thinnest portion of the model.

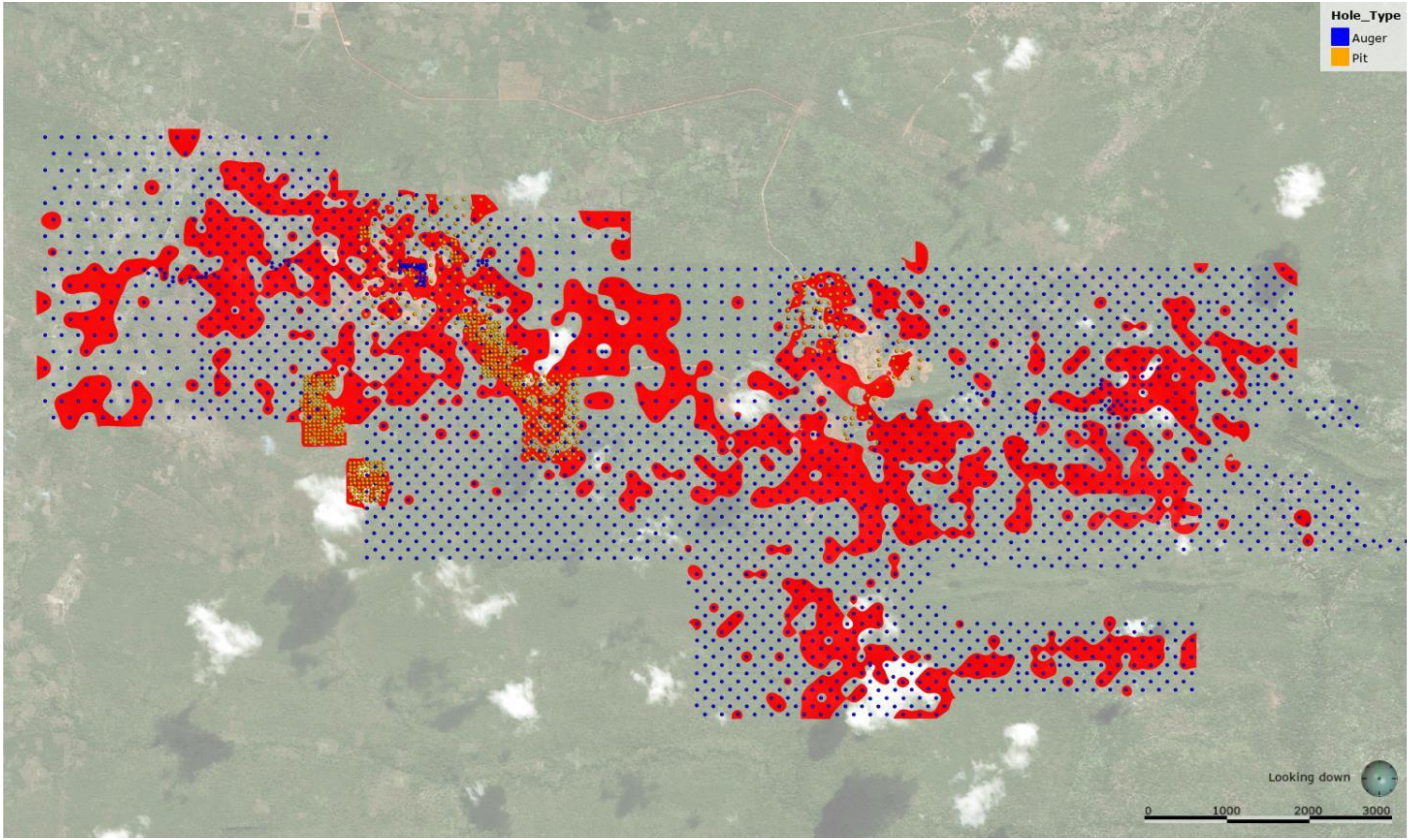

Figure 4-1: Plan view of the gravel bed model (in red), shown relative to the collar locations of auger drill holes (in blue) and exploration pits (in orange) and overlain on Google Earth satellite imagery.

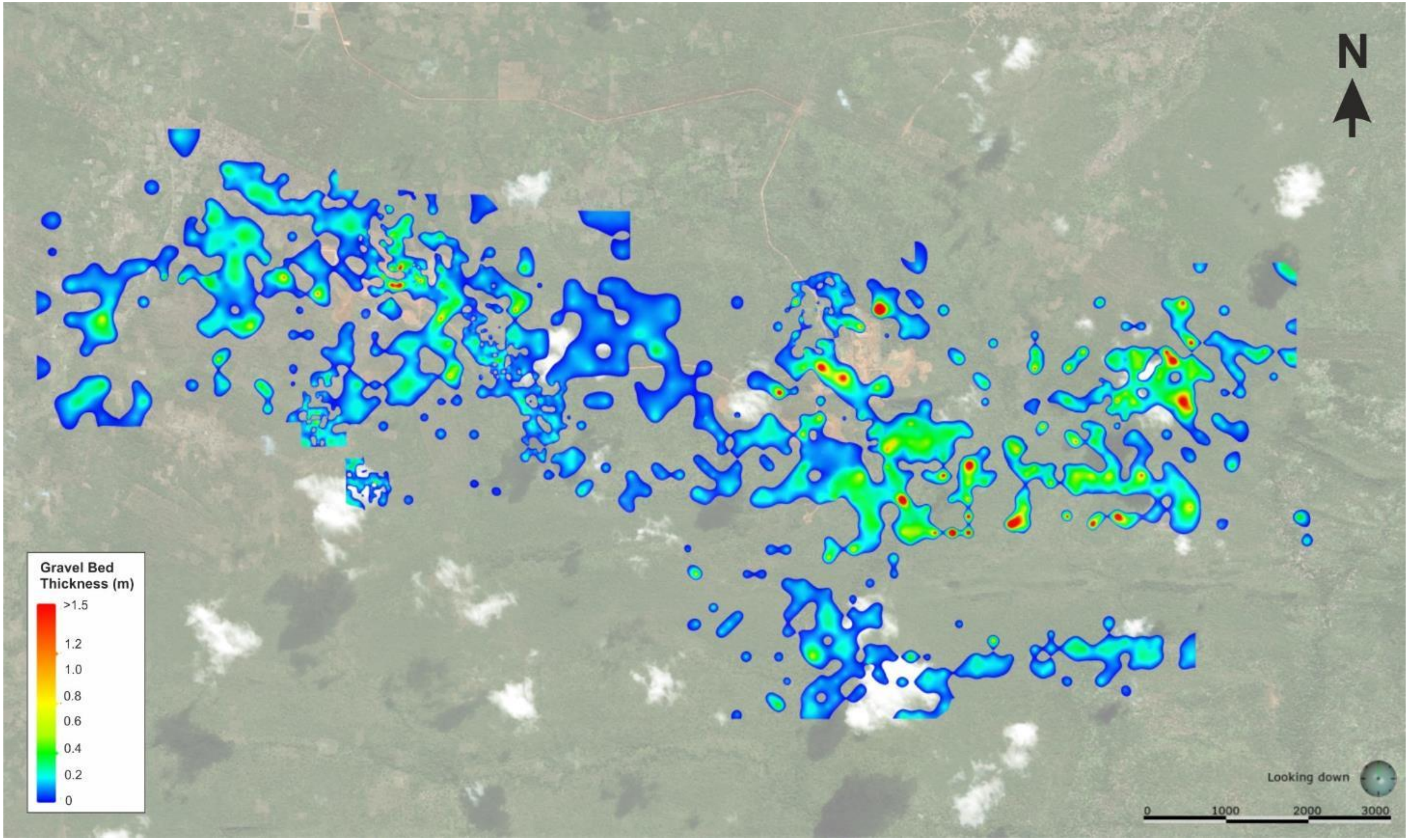

Figure 4-2: Plan view of the gravel bed model coloured by thickness, on Google Earth satellite imagery.

Gravel Bed "Skin":

Due to the relatively thin average thickness of the gravel bed, and the inherent small-scale variability associated with the unit, it is not possible to mine the gravel bed in isolation. Furthermore, the gravel bed grade and tonnage statistics in the MRM production data relate to the gravel bed horizon, plus overburden waste, mined as part of the same face. MRM has indicated that the standard mining practice is to take an average 0.3 m of waste both above and below the gravel bed, with a standard minimum mining thickness of 1.5 m (i.e. if the gravel bed is <0.9 m thick then the face height reverts to 1.5 m). A gravel bed "skin" model was created to reflect this, based on the gravel bed model, expanded by 0.3 m on both the footwall and hangingwall sides, or set to a standard 1.5 m thickness where the gravel bed model is less than 0.9 m thick.

4.1.2 Maninge Nice Amphibolite

The Maninge Nice amphibolite body, host to the primary mineralisation, was modelled through sectional polyline interpretations, and cropped to terminate on the modelled basement surface (Figure 4-2 and Figure 4-4). The model incorporates logged amphibolite in a total of 11 Phase 1 diamond drill holes and four exploration pits, that terminate in weathered amphibolite. The amphibolite unit is a near-flat lying, east-west trending lensoidal body, which is interpreted to lie in the hinge of a gentle, rounded synform with a broadly east-west trending axial plane, parallel to the regional structural trend.

The Maninge Nice amphibolite model was sub-domained into "Highly Weathered", "Moderately Weathered" and "Less Weathered" portions, based on the weathering codes in the MRM diamond drill hole geology log (Figure 4-3). The base of weathering extends beyond the deepest point of the principal amphibolite unit.

A minor (approximately 10-15 m true thickness) and discontinuous, south-dipping amphibolite lens is intersected by a total of four Phase 1 diamond drill holes, approximately 800 m east of the Maninge Nice pit. In addition, MRM completed two further models of amphibolite bodies based on the Phase 2 diamond drill data. As these areas have not been mined, or subjected to a bulk sampling programme, the modelled amphibolite bodies have not been used to support a declaration of Mineral Resources at this time.

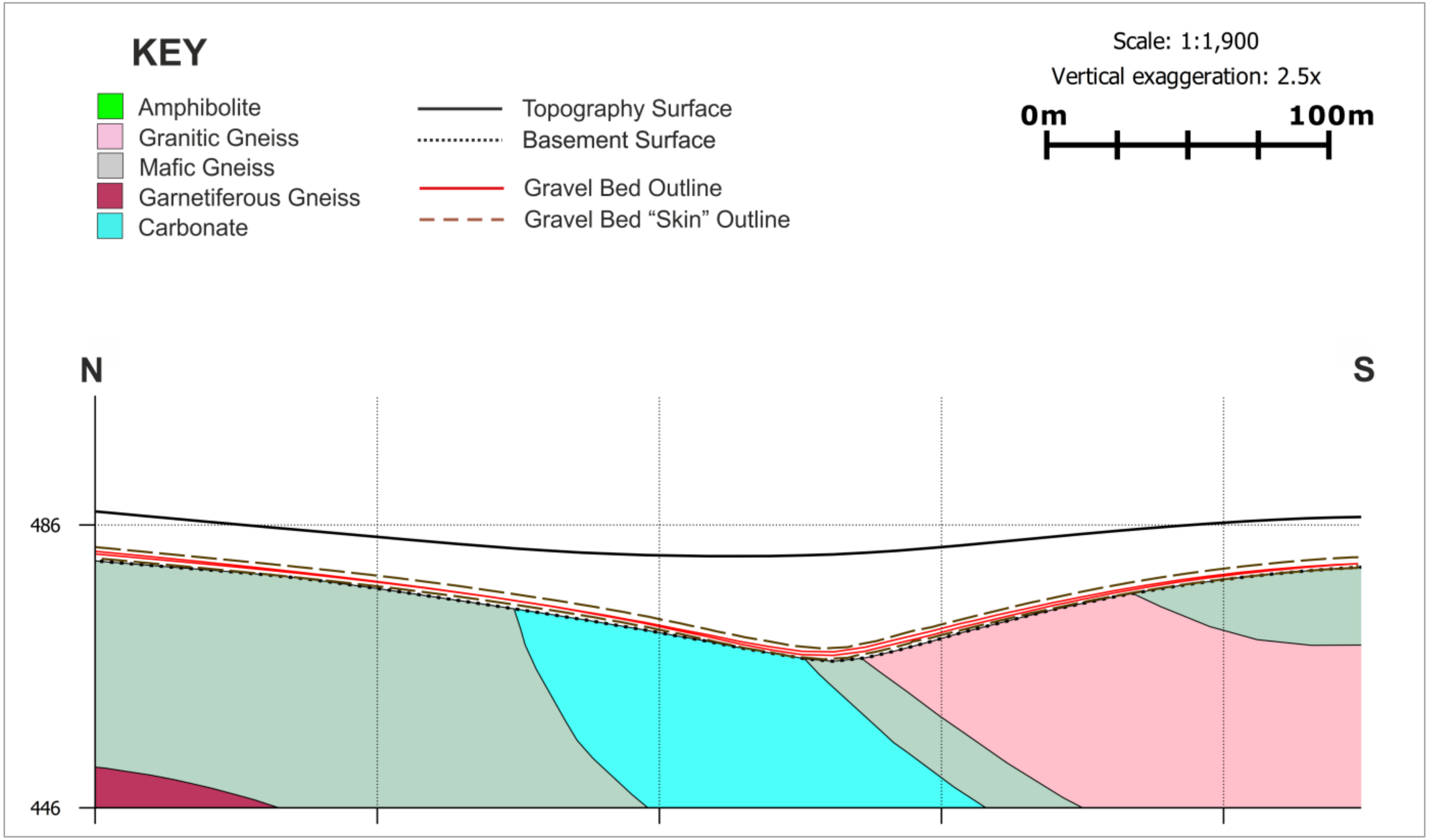

Figure 4-3: The modelled gravel bed (red) and gravel bed "skin" (dashed brown) shown relative to the basement geology model. Note that the gravel bed model broadly mirrors the trend of the basement surface

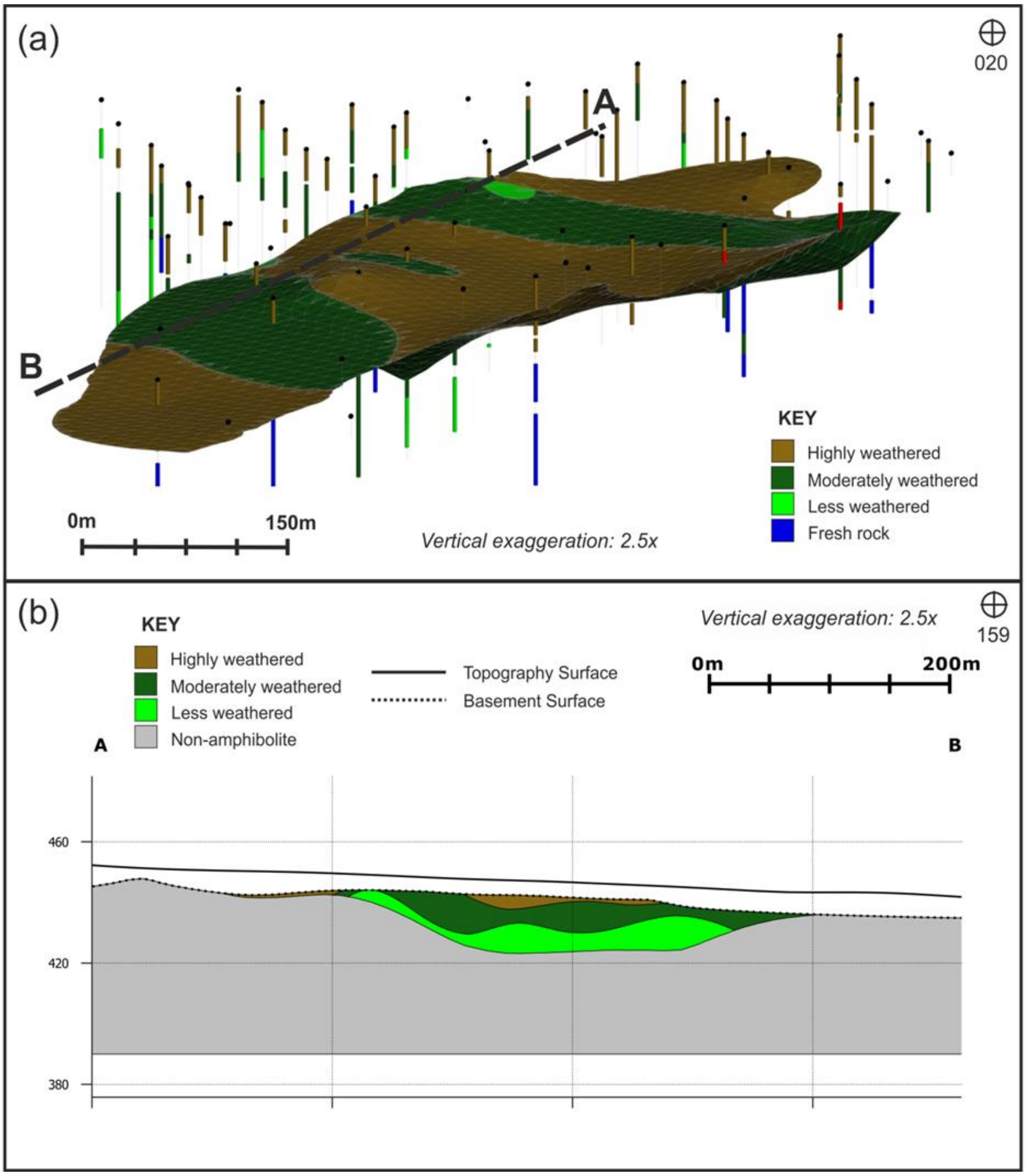

Figure 4-4: Oblique (a) and sectional (b) views of the Maninge Nice amphibolite model coloured by degree of weathering

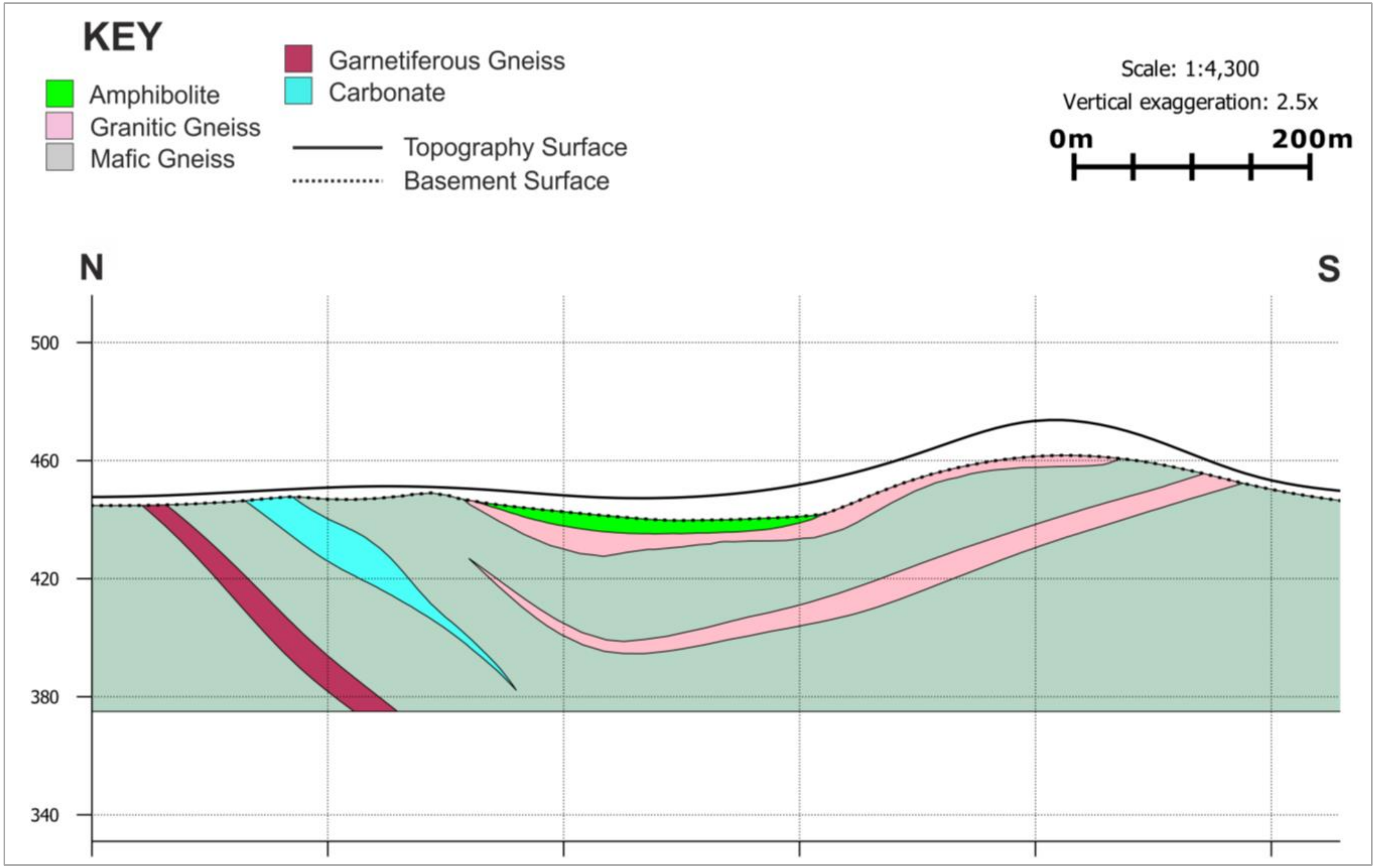

Figure 4-5: North-south cross section through the Maninge Nice area, displaying the amphibolite host to the primary mineralisation, in relation to the modelled granitic gneiss, mafic gneiss, carbonate and garnetiferous gneiss lithologies

4.2 Distribution of Ruby Grade within the Gravel Bed

4.2.1 Variation in Ruby Grade in the Auger Holes and Exploration Pits

In order to better understand the distribution of ruby grade within the gravel bed, the CP completed analysis and modelling based on the ruby stone recovery data from the exploration pits and auger drilling, as described in Section 3.7.2 and Section 3.9.3 respectively. The ruby recovery data from the auger drilling and exploration pitting represents the overall ruby grade, and does not provide any breakdown of stone quality, as is available from production. Nevertheless, given the large number of auger holes and exploration pits and their distribution throughout the gravel bed, it is considered that this data provides a useful insight into the variability of the overall ruby grade throughout the secondary deposit, particularly in areas a significant distance from the production pits.

Table 4-1 details the proportion of auger holes and exploration pits from which rubies have been recovered. The results indicate that, despite the larger volume of gravel bed recovered from the exploration pits relative to the auger holes, the incidence of rubies is similar in both.

Table 4-1: The proportion of auger holes and exploration pits with recovered rubies.

Data	*Number of holes / pits that intersect the gravel bed*	*Number of these holes / pits with recorded recovered rubies*	*Proportion of these holes / pits with recorded recovered rubies*
Auger Holes (all areas)	950	214	23%
Auger Holes in vicinity of Mugloto Exploration Pits	127	21	17%
Mugloto Exploration Pits	303	44	15%

To assess the variation in ruby grades from the auger drilling and exploration pitting, a block modelling exercise of grades within the modelled gravel bed was completed. For the auger holes completed in the Mugloto area, the ruby grade data typically relates to standard 1 m intervals, in which case the ruby recovery data grades were adjusted to remove dilution and the interval depths were changed to reflect that of the logged gravel bed.

In the small number of cases where the high-grade sample did not coincide with the logged gravel bed interval, this was assumed to be a logging error and the high grade was assigned to the logged gravel bed interval. All remaining logged gravel bed intervals, without any associated recovered rubies were assigned a background grade of 0 carats per tonne (“ct/t”).

In all other auger holes and the Mugloto exploration pits, the ruby recovery intervals correspond to the logged gravel bed intervals, so no grade adjustments were necessary. No ruby recovery data is available for the exploration pits at Maninge Nice and Glass, and thus these pits were not used for the grade interpolation exercise.

After applying the adjustments described, the ruby grade data from the auger holes and exploration pits was interpolated into a block model, coded and sub-blocked against the gravel bed wireframe as described in Section 4.1.1, based on the following criteria:

- In each auger hole and exploration pit, the ruby grade data was composited to a single sample over the gravel bed intersection;

- No production data was used for this exercise;
- Composited ruby grades capped at 200 ct/t, to reduce the impact of anomalously high sample grades that are considered to be outside of the normal observed sample distribution;
- A parent block size of 400 m(x) x 400 m(y) x 100 m(z);
- A minimum sub-block size of 4 m(x) x 4 m(y) x 0.05 m(z);
- Ruby ct/t grades were estimated into parent blocks, using the capped composite ruby recovery data inside the gravel bed wireframe, and sub-blocks assigned the grade of the corresponding parent block;
- Ruby ct/t values were interpolated using Ordinary Kriging;
- Isotropic variogram and search ellipsoid, with a range of 1,000m and nugget of 90%; and
- A maximum of 10 samples were used to estimate into each block, in order to ensure a relatively local estimate and reduce the impact of distal high-grade intersections.

The gravel bed block model, coloured by the interpolated auger drilling and exploration pit ruby grades is displayed in Figure 4-6. The model indicates a level of variation in total ruby grade across the gravel bed, with broad areas that are consistently low in grade and other broad areas that have variable, but demonstrably higher grade throughout.

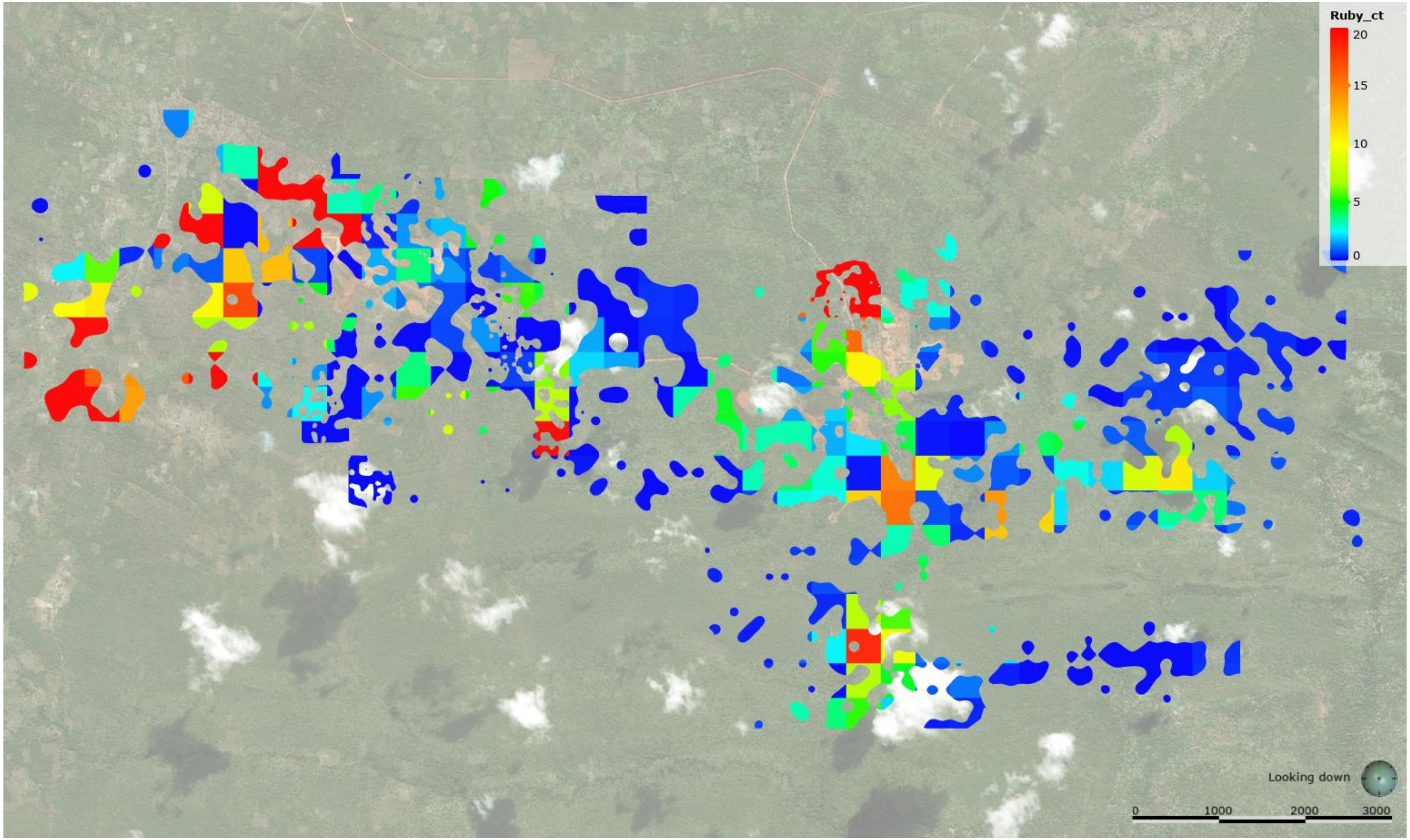

Figure 4-6: The gravel bed block model, coloured by interpolated auger drilling and exploration pit ruby grades, overlain on Google Earth satellite imagery.

To assess the accuracy of the interpolated ruby grades, the CP compared the block model grades with the production pit records on a local basis, limited to the area of gravel bed extraction within each production pit. The CP notes that the production grades include mining dilution, whilst the modelled auger and exploration pit grades relate to the in-situ gravel bed alone. In order to provide a like-for-like comparison of grade, a factor was applied to the production grades toremove the effect of dilution. The factor is based on the thickness ratio of gravel bed to gravel bed and skin, which was done separately for the Mugloto and combined Maninge Nice / Glass areas, resulting in the following factors, used to inflate the production grades to become in-situ grades:

Mugloto – 6.73;

Maninge Nice / Glass – 4.36.

A more detailed description of how the dilution factors have been derived is provided in Section 4.5.1. Table 4-2 and Figure 4-7 show the interpolated auger drilling and exploration pit grades and the factored production grades in the area of gravel bed extraction within each production pit.

The production pits characterised by high total ruby grades correlate with increased interpolated ruby grades, and vice versa. Notable exceptions to this are Glass B Pit 1 and Maninge Nice Pit 5, both of which have only had minimal production to date, and Maninge Nice Pit 3, for which the high production grade is considered to be related to the presence of underlying primary mineralisation and for which there are very few auger holes in the vicinity.

Table 4-2 and Figure 4-7 also indicate that, despite the general correlation of relative grade in the two datasets, the block grades estimated from the auger drilling and exploration pits are generally significantly lower grade than the corresponding production pit grades. This is likely to be due to the very sporadic distribution of larger stones and presence of very small high-grade pockets which are encountered during production but only rarely, if ever, encountered in the relatively small volume samples generated by exploration pitting and augering.

Given that the auger and exploration pit data do not match the grade values reported from production data and that auger-pitting data gives total ruby and corundum grade, rather than a breakdown of grade based on stone type, it is considered that this exploration data cannot be used directly to influence the Mineral Resource grade estimate, but it does provide a useful tool for delineating broad areas of higher and lower grade, in areas where production data is not yet available.

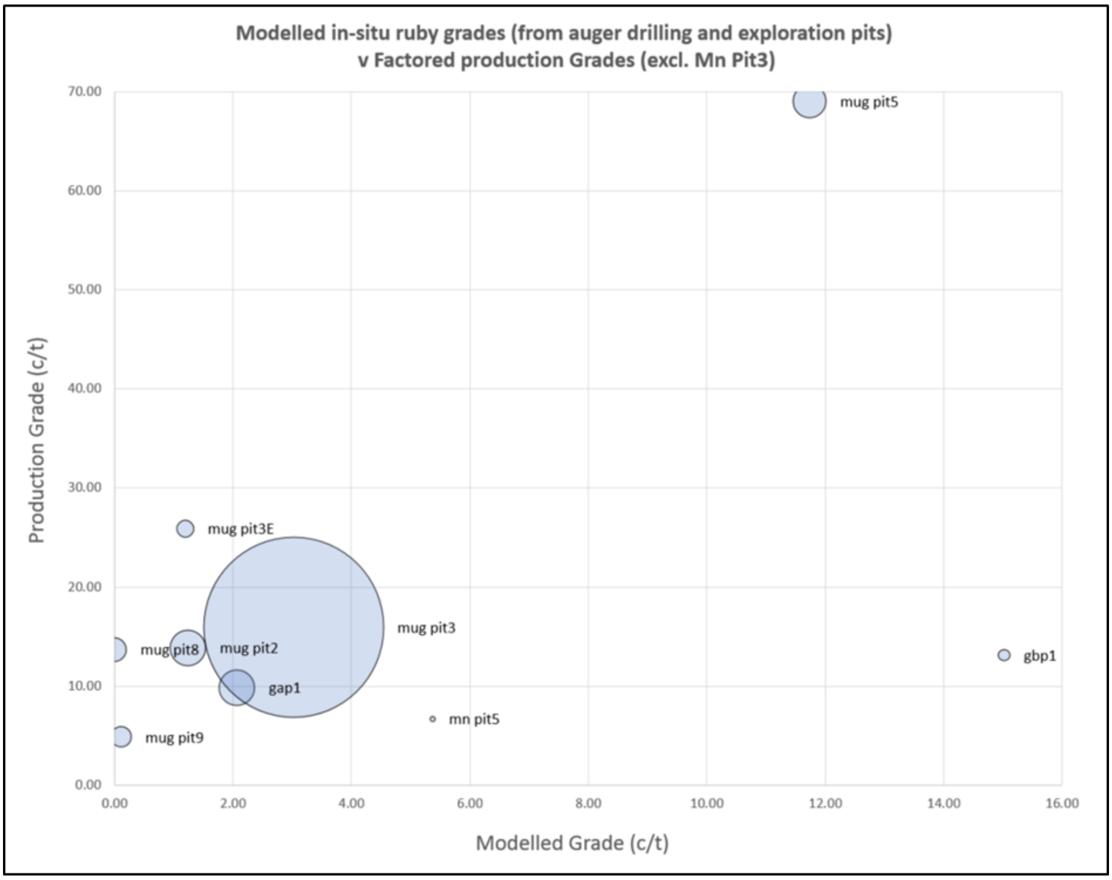

Figure 4-7: Scatterplot of interpolated auger drilling and exploration pit grades (x axis) against the factored in-situ production grades (y axis) in the area of gravel bed extraction within each production pit. Bubble size is relative to the volume of production from each pit.

Table 4-2: Comparison of production grades and interpolated auger drilling and exploration pit grades, in the areas for which gravel bed has been extracted in each production pit*

Production Pit	*Production Grades (total ruby ct/t) factored to remove dilution*	*Interpolated Block Grades from Auger Drilling and Exploration Pitting Data (total ruby ct/t)*	*Production Head Feed up to end of 2017 (tonnes)*
Glass A Pit 1	9.89	2.07	45,078
Glass B Pit 1	13.14	15.02	5,278
Maninge Nice Pit 3	276.37	0.82	362,464
Maninge Nice Pit 5	6.72	5.37	1,101
Mugloto Pit 3	15.96	3.02	1,112,825
Mugloto Pit 3E	25.89	1.19	10,589
Mugloto Pit 5	69.01	11.74	38,504
Mugloto Pit 8	13.69	0.00	20,113
Mugloto Pit 9	4.87	0.11	15,304
Mugloto Pit 2	13.87	1.24	44,514

*Note that any production pits that do not over*lap with modelled gravel bed are not included in this table. Likewise, production pits from which gravel bed has been extracted, but not yet processed are not included.*

4.2.2 Variation in Production Grades

Consistent with the variability indicated by the auger hole and exploration pit ruby grade modelling, the historical production data also suggests a level of variation in grade across the modelled gravel bed. MRM note that there is a degree of variability recorded between pits, which is a result of occasional erratic distribution of stones in the pockets and traps within the gravel bed.

The grade of the gravel bed is recorded on a weekly, monthly, and annual basis, with the production history being kept since the start of production in 2014. The production history demonstrates that there is a high degree of variability in the recorded grade, however in the larger pits the grade is similar on a year to year basis. The average grade across groups of exploration pits is considered appropriate for use in any mine planning exercises.

For reference, a mine-to-date summary of production grades from each pit is given in Table 4-3. The locations of these pits are given in Figure 3-4. Production grades are inclusive of mining dilution which is a significant factor in the gravel beds but only a negligible factor in the primary mineralisation.

Table 4-3: Mined-to-date production data as of end of 2017

Pit Name	Material Type	To plant (t)	Total Carats Recovered (ct)	Premium and Ruby Carats Recovered (ct)	Total Grade (ct/t)	Premium and Ruby Grade (ct/t)
Pit 2	Gravel Bed	44,514	91,758	14,672	2.06	0.33
Pit 3	Gravel Bed	1,112,825	2,638,351	1,108,077	2.37	1.00
Pit 3E	Gravel Bed	10,589	40,741	4,086	3.85	0.39
Pit 5	Gravel Bed	38,504	394,837	11,651	10.25	0.30
Pit 7	Gravel Bed	2,901	117,823	1,708	40.61	0.59
Pit 8	Gravel Bed	20,113	40,910	16,186	2.03	0.80
Pit 9	Gravel Bed	15,304	11,082	7,237	0.72	0.47
Mugloto Total	**Gravel Bed**	**1,244,750**	**3,335,502**	**1,163,616**	**2.68**	**0.93**
Glass A Pit 1	Gravel Bed	43,319	66,056	14,531	1.52	0.34
Glass B Pit 1	Gravel Bed	5,278	15,904	173	3.01	0.03
Glass Total	**Gravel Bed**	**50,356**	**118,200**	**16,272**	**2.35**	**0.32**
Maninge Nice Pit 3	Gravel Bed	362,464	22,975,400	1,162,844	63.39	3.21
Maninge Nice Pit 5 **	Gravel Bed	1,101	1,697	712	1.54	0.65
Maninge Nice Secondary Total	**Gravel Bed**	**363,565**	**22,977,097**	**1,163,557**	**63.20**	**3.20**
Maninge Nice Pit3 **	Amphibolite	**109,447**	**10,712,884**	**348,830**	**97.9**	**3.20**
Maninge Nice Primary Total	**Amphibolite**	**109,447**	**10,712,884**	**348,830**	**97.9**	**3.20**

** Note that any production pits that do not overlap with modelled gravel bed are not included in this table. Likewise, production pits from which gravel bed has been extracted, but not yet processed are not included.*

*** All tonnages relate to production up to 31 December 2017, other than Maninge Nice Pit 5 tonnage (which forms part of the Glass Maninge Nice Domain), which relates to production up to 31 August 2018*

The percentage of each ruby quality class for each pit is shown in Table 4-6 and Table 4-7.

Table 4-4: Mined-to-date production split by pit and ruby quality classes (ct/t)

Pit	Material Type	Recovered Grade	Premium Ruby	Ruby	Low Ruby	Corundum	Sapphire	Low Sapphire	<4.6mm
		(ct/t)	(ct/t)	(ct/t)	(ct/t)	(ct/t)	(ct/t)	(ct/t)	(ct/t)
Pit 2	Gravel Bed	2.06	0.03	0.16	0.17	0.11	1.13	0.00	0.46
Pit 3	Gravel Bed	2.37	0.27	0.89	0.10	0.10	0.35	0.38	0.28
Pit 3E	Gravel Bed	3.85	0.07	0.25	0.14	1.73	0.76	0.90	0.00
Pit 5	Gravel Bed	10.25	0.04	0.15	0.15	0.20	1.27	7.65	0.79
Pit 7	Gravel Bed	40.61	0.03	0.06	0.53	1.87	1.93	34.98	1.21
Pit 8	Gravel Bed	2.03	0.03	0.76	0.05	0.44	0.13	0.39	0.24
Pit 9	Gravel Bed	0.72	0.15	0.47	0.01	0.02	0.02	0.07	0.00
Mugloto Total	**Gravel Bed**	2.68	0.25	0.83	0.10	0.13	0.41	0.67	0.30
Glass A Pit 1	Gravel Bed	1.52	0.06	0.28	0.07	0.08	0.63	0.26	0.16
Glass B Pit 1	Gravel Bed	3.01	0.01	0.02	0.13	0.44	0.17	2.03	0.21
Glass Total	**Gravel Bed**	2.35	0.05	0.08	0.04	0.06	0.23	0.12	0.11
Maninge Nice Pit 3	Gravel Bed	63.39	0.01	3.19	6.06	8.89	24.59	6.87	13.78
Maninge Nice Pit 5 **	Gravel Bed	1.54	0.05	0.59	0.05	0.31	0.12	0.42	0.00
Maninge Nice Secondary Total	**Gravel Bed**	63.20	0.01	3.19	6.04	8.86	24.51	6.85	13.74
Maninge Nice Pit3 **	Amphibolite	97.9	0.01	3.2	9.2	13.4	48.1	4.5	19.6
Maninge Nice Primary Total	Amphibolite	97.9	0.01	3.2	9.2	13.4	48.1	4.5	19.6

** Note that any production pits that do not overlap with modelled gravel bed are not included in this table. Likewise, production pits from which gravel bed has been extracted, but not yet processed are not included.*

*** All tonnages relate to production up to 31 December 2017, other than Maninge Nice Pit 5 tonnage (which forms part of the Glass Maninge Nice Domain), which relates to production up to 31 August 2018*

Table 4-5: Mined-to-date production split by pit and ruby quality classes (%)

Pit	Material Type	Recovered Grade (ct/t)	Premium Ruby (%)	Ruby (%)	Low Ruby (%)	Corundum (%)	Sapphire (%)	Low Sapphire (%)	<4.6mm (%)
Pit 2	Gravel Bed	2.06	1.5%	7.9%	8.1%	5.4%	54.8%	0.0%	22.4%
Pit 3	Gravel Bed	2.37	11.4%	37.7%	4.3%	4.3%	14.7%	15.9%	11.7%
Pit 3E	Gravel Bed	3.85	1.8%	6.4%	3.6%	45.1%	19.8%	23.3%	0.0%
Pit 5	Gravel Bed	10.25	0.4%	1.5%	1.5%	2.0%	12.4%	74.6%	7.7%
Pit 7	Gravel Bed	40.61	0.1%	0.2%	1.3%	4.6%	4.7%	86.1%	3.0%
Pit 8	Gravel Bed	2.03	1.3%	37.2%	2.4%	21.8%	6.6%	19.1%	11.8%
Pit 9	Gravel Bed	0.72	20.3%	64.4%	0.9%	2.2%	2.7%	9.5%	0.0%
Mugloto Total	**Gravel Bed**	2.68	9.2%	31.0%	3.9%	4.8%	15.1%	25.0%	11.0%
Glass A Pit 1	Gravel Bed	1.52	4.0%	18.0%	4.4%	5.3%	41.2%	16.9%	10.2%
Glass B Pit 1	Gravel Bed	3.01	0.4%	0.7%	4.3%	14.6%	5.7%	67.2%	7.1%
Glass Total	**Gravel Bed**	2.35	2.3%	11.5%	5.9%	9.2%	36.1%	18.5%	16.6%
Maninge Nice Pit 3	Gravel Bed	63.39	0.0%	5.0%	9.6%	14.0%	38.8%	10.8%	21.7%
Maninge Nice Pit 5 **	Gravel Bed	1.54	3.6%	38.4%	3.3%	19.9%	7.7%	27.2%	0.0%
Maninge Nice Secondary Total	**Gravel Bed**	63.20	0.0%	5.0%	9.6%	14.0%	38.8%	10.8%	21.7%
Maninge Nice Pit3 **	Amphibolite	97.9	0.01%	3.3%	9.4%	13.7%	53.7%***	-	20.0%
Maninge Nice Primary Total	Amphibolite	97.9	0.01%	3.3%	9.4%	13.7%	53.7%***	-	20.0%

** Note that any production pits that do not overlap with modelled gravel bed i are not included in this table. Likewise, production pits from which gravel bed has been extracted, but not yet processed are not included.*

*** All tonnages relate to production up to 31 December 2017, other than Maninge Nice Pit 5 tonnage (which forms part of the Glass Maninge Nice Domain), which relates to production up to 31 August 2018*

****For the primary material, the Sapphire and Low Sapphire classes were combined*

The production data detailed in Table 4-3, Table 4-4 and Table 4-5 illustrates the variation between the different areas within the deposit. Production to date indicates that, overall, the amount of ruby and corundum recovered in the Mugloto and Glass areas is similar, but that the proportion of premium stones recovered from Mugloto is significantly in excess of the proportion of premium stones at Glass. Specifically, approximately 40% stones from the Mugloto gravel bed are of premium ruby and ruby quality, whilst approximately 15% of the stones from the gravel bed at Glass are of premium ruby and ruby quality.

The overall grade at Maninge Nice Pit 3, which directly overlies the primary amphibolite-hosted mineralisation, is significantly in excess of the grades at Mugloto and Glass, but the proportion of premium stones is much lower (approximately 5%). Maninge Nice Pit 5, which does not overly primary mineralisation, has a similar grade and quality profile to Mugloto and Glass. As previously noted, this suggests that Maninge Nice Pit 3 is potentially not representative of the rest of the Maninge Nice area, owing to an abundance stones from the underlying amphibolite that have only been transported a short distance.

The other pit characterised by a comparably high grade and low proportion of high quality stones is Mugloto Pit 7, which is has a total grade of approximately 40 ct/t, of which <0.5% are of premium or ruby quality. This small pit is approximately 3km east of the other Mugloto Pits and represents the only production to date from the eastern portion of Mugloto. The results of the production from this pit, albeit based on a relatively small volume of mined gravel bed in relation to most other production pits, indicate potential differing grade profiles in the east and west of Mugloto.

4.3 Paleo Drainage Modelling

The current genetic model for the gravel bed hosted mineralisation involves initial deposition as a result of one or more major flooding events, followed by redistribution / remobilisation of the rubies by alluvial processes. In order to better understand the likely distribution of major drainage channels at the time that the gravel bed was deposited, the CP completed a watershed analysis, based on the modelled basement surface described in Section 4.1.1.

Catchments and drainage lines were delineated using Global Mapper software, which provides an analysis tool to generate watersheds (an area or ridge of land that separates water flowing to different rivers, basins or seas). The watershed calculation uses an eight-direction pour point algorithm to calculate the flow direction at each location, along with a bottom-up approach for determining flow direction through flat areas and a custom algorithm for automatically filling depressions in the terrain data.

Several delineation scenarios have been generated based on the adjustment of the stream cell count (“SCC”). This controls how much water must flow to a particular cell before it is considered part of a "stream". Larger values will result in only more water flow areas being delineated, while smaller values will cause more minor water flows to be marked as streams.

Figure 4-8 displays the major paleo drainage channels derived from watershed analysis of the modelled basement surface, at a stream cell count of 30,000. The drainage channels are also displayed relative to the gravel bed wireframe in Figure 4-9 and the interpolated gravel bed ruby grades from the auger drilling and exploration pitting data in Figure 4-10. Comparison of the drainage channels with the gravel bed and grade modelling suggests that the paleo drainage channels do somewhat influence the distribution and grade of the gravel bed. Most notably, the gravel bed appears to be more common in the vicinity of the drainage channels than away from the drainage channels. Similarly, the modelled ruby grade from the auger drilling and exploration pitting is typically higher in the vicinity of the paleo drainage channels than away from the channels, with the main areas of consistent lower grade being distal to any major channels.

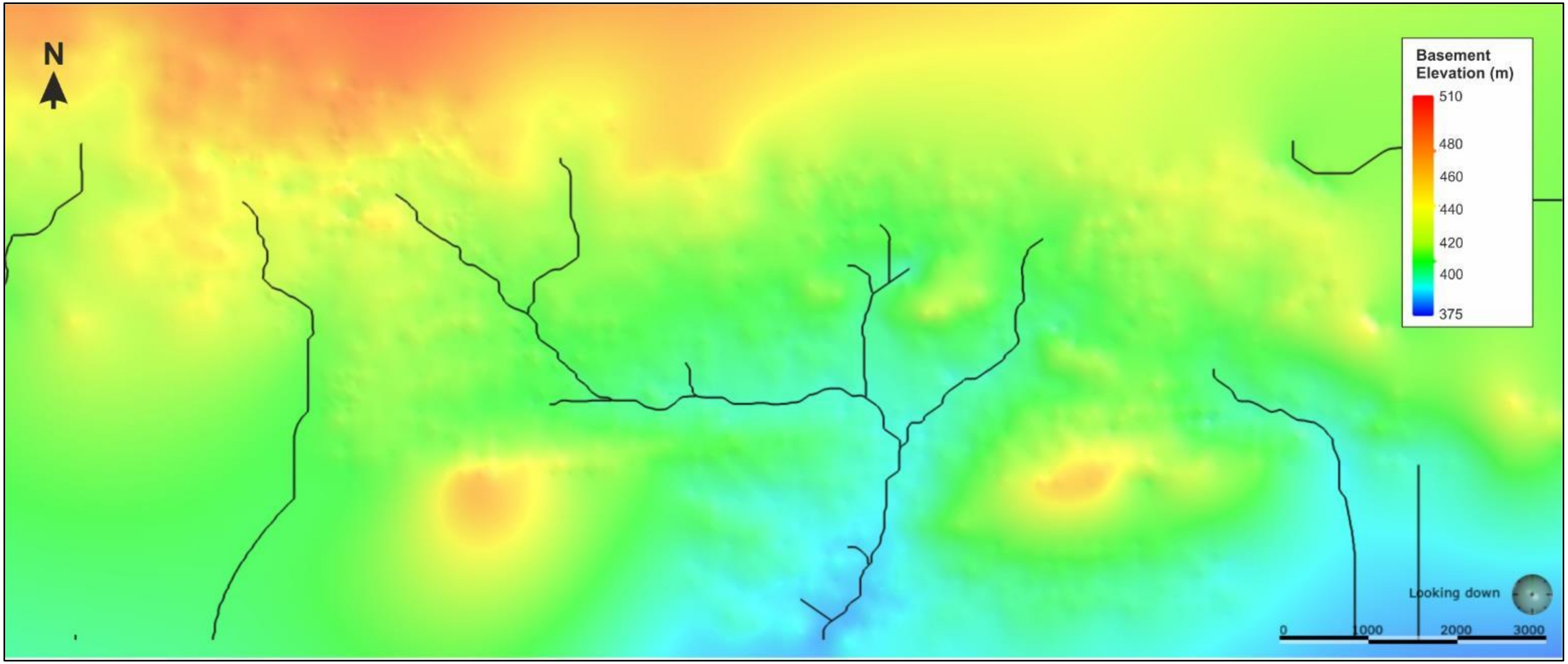

Figure 4-8: Major paleo drainage channels (in black) derived from watershed analysis of the modelled basement surface, shown relative to the modelled basement surface, coloured by elevation.

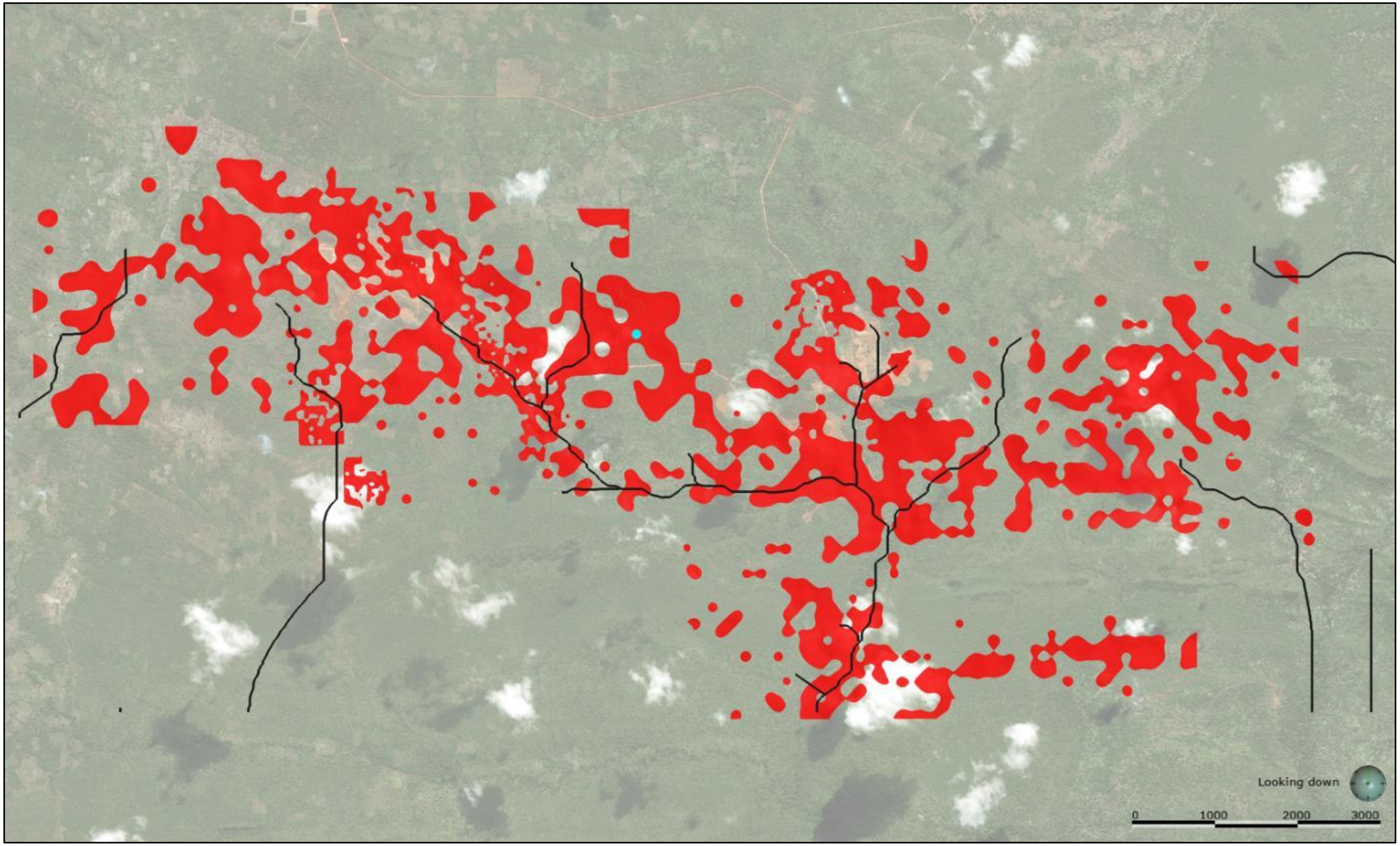

Figure 4-9: Major paleo drainage channels (in black) derived from watershed analysis of the modelled basement surface, shown relative to the modelled gravel bed and overlain on Google Earth satellite imagery.

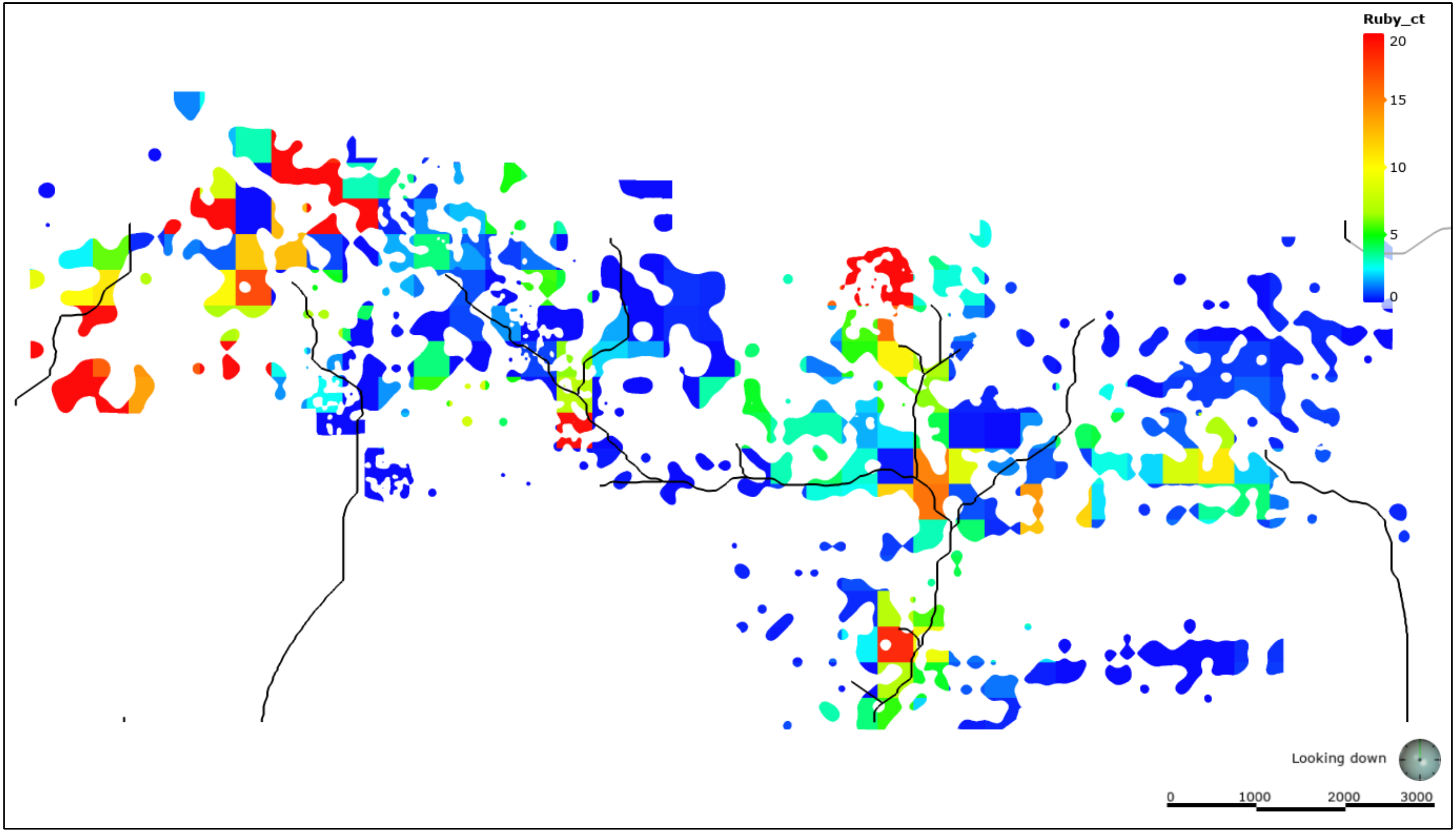

Figure 4-10: Major paleo drainage channels (in black) derived from watershed analysis of the modelled basement surface, shown relative to the gravel bed block model, coloured by interpolated auger drilling and exploration pit ruby grades.

4.4 Gravel Bed Grade Domain Definition

In order to appropriately reflect the variation in ruby grade and quality throughout the gravel bed (as described in Section 4.2) in the Mineral Resource Estimate, the CP have divided the gravel bed model into a total of 8 spatial domains based on auger/pit grade populations and geological / topographical control. The domain outlines are largely based on the following:

- Areas of similar total ruby grade in the production pits;
- Areas of similar premium stone grade in the production pits;
- Areas of similar total ruby grade modelled on ruby recovery data from the auger holes and exploration pits (as described in Section 4.2.1);
- Good correlation in the general quantum of grade between the production pit grades and the ruby grade modelled on ruby recovery data from the auger holes and exploration pits;
- Broad division of domains based on major paleo drainage channels.

The gravel bed domains are displayed in Figure 4-11, and summarised below:

Mugloto Domain:

Description – Comprises a number of production pits focussed along a single, south-east flowing, major paleo drainage channel. Production pits are of variable grade and quality but are generally of moderate grade and with a high proportion of premium stones. All production pits in this domain have a significantly lower total grade and significantly higher proportion of premium stones than Mugloto Pit 7.

Included Production Pits (for which gravel bed has been processed) - Mugloto Pit 1A, Mugloto Pit 2, Mugloto Pit 3, Mugloto Pit 3E, Mugloto Pit 5, Mugloto Pit 8 and Mugloto Pit 9.

Mugloto West Domain

Description – To the west of the main Mugloto domain and focussed along a single, south-west flowing, major paleo drainage channel. The interpolated block grades from the auger holes and exploration pit ruby recovery data in this domain are significantly higher than the modelled grades in the Mugloto domain, which is consistent with the only production pit in this domain, Mugloto Pit 7, which has a very high total grade, but low proportion of premium stones compared to the other production pits in the main Mugloto domain. Mugloto Pit 7 includes a relatively small volume of mined gravel bed in relation to most other production pits, however, in the CP’s opinion, the clear differences in ruby grade and quality in this pit compared to the Mugloto Domain production pits, coupled with the contrast in the interpolated block grades between Mugloto and Mugloto West, justify defining a separate domain for the west of Mugloto at this stage.

Included Production Pits (for which gravel bed has been processed) – Mugloto Pit7.

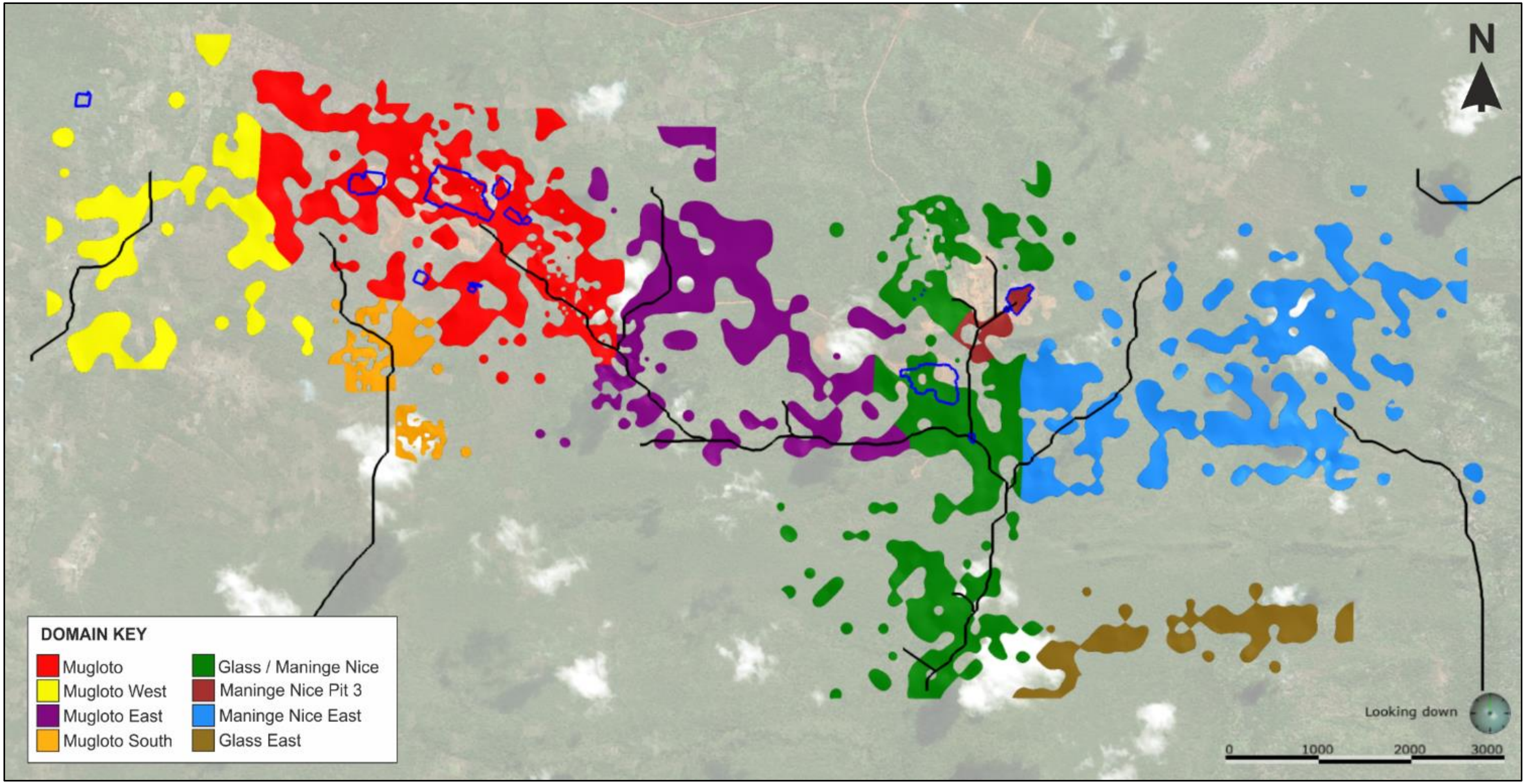

Figure 4-11: The gravel bed model, coloured by domain and shown relative to the paleo drainage channels (in black) derived from watershed analysis of the modelled basement surface. The extent of gravel bed extraction for all production pits with processed gravel bed are displayed as blue outlines.

Mugloto East Domain

Description – Based on the continuation of the main Mugloto drainage channel and the confluence of this with another major (south flowing) drainage channel. In this continuation of the Mugloto drainage the gravel bed is not as continuous as up-stream and the interpolated ruby grade from the auger hole and exploration pit ruby recovery data is significantly lower than the Mugloto domain.

Included Production Pits (for which gravel bed has been processed) – None.

Mugloto South Domain

Description – South of the main Mugloto Domain and focussed along a single, south flowing, major paleo drainage channel, separate to the paleo drainage channel that runs through the Mugloto and Mugloto East Domains. The domain is heavily sampled by exploration pits, almost none of which intersected any rubies, and as such the interpolated block grades from exploration pit and auger holes data are very low in this domain compared to the adjacent areas. This is distinctly different to the main Mugloto Domain.

Included Production Pits (for which gravel bed has been processed) – None.

Glass / Maninge Nice Domain

Comprises three production pits (Glass A Pit 1, Glass B Pit 1 and Maninge Nice Pit 5) focussed along a single, south flowing, major paleo drainage channel. The production pits are generally of moderate grade and with moderate proportion of premium stones. All production pits in this domain have a significantly lower total grade and significantly higher proportion of premium stones than Maninge Nice Pit 3.

Included Production Pits (for which gravel bed has been processed) – Maninge Nice Pit 5, Glass A Pit 1, Glass B Pit 1.

Maninge Nice Pit 3 Domain

Description – The CP considers that the very high total grade and low proportion of premium stones recovered from the gravel bed in Maninge Nice Pit3 is likely to be attributable to the presence of the underlying mineralised amphibolite, which is also associated with a very high grade and low proportion of premium stones. This is considered to be potentially related to an abundance stones from the underlying amphibolite that have not been transported any significant distance, sitting within the gravel bed extracted from this pit. This interpretation is supported by the significantly lower grade and higher premium stone proportion attributed to the surrounding production pits (including Maninge Nice Pit 5). The extent of the Maninge Nice Pit 3 Domain is limited to downstream of the Maninge Nice amphibolite (as modelled - see Section 4.1.2) south to mid-way between Maninge Nice Pit 3 and Glass A Pit 1 (which is the production pit immediately downstream of Maninge Nice Pit 3).

Included Production Pits (for which gravel bed has been processed) – Maninge Nice Pit3

Maninge Nice East Domain

Description – Domain to the east of the main Maninge Nice / Glass paleo drainage channel, characterised by a significantly lower ruby grade interpolated from the auger hole and exploration pit ruby recovery data, compared with the corresponding interpolated ruby grade in the Glass / Maninge Nice Domain.

Included Production Pits (for which gravel bed has been processed) – None.

Glass East Domain

Description – Domain to the southeast of the main Maninge Nice / Glass paleo drainage channel, characterised by a significantly lower ruby grade interpolated from the auger hole and exploration pit ruby recovery data, compared with the corresponding interpolated ruby grade in both the Glass / Maninge Nice Domain and the Maninge Nice East Domain. The Glass East Domain is geographically disconnected from the Maninge Nice East domain by an E-W oriented ridge. No major paleo drainage channels have been identified in this domain.

Included Production Pits (for which gravel bed has been processed) – None.

4.5 Grade and Tonnage Estimation Approach

In order to produce a Mineral Resource model for input into the subsequent mining studies, the CP has generated a block model, coded and sub-blocked by the geological model volumes (namely the gravel bed, the gravel bed dilution skin and the primary Maninge Nice amphibolite), with all other blocks being coded as "waste". The blocks were further coded by the gravel bed domains described in Section 4.4. The block extents and dimensions are consistent with those outlined in Section 4.2.1.

The approach taken to populate the empty block model with grade and density values for the derivation of the Mineral Resource is described in the following sections.

4.5.1 Production data and derivation of dilution factors

Where available, grades in the Mineral Resource are derived directly from the results achieved from the actual production results described in Section 3.8. This is the only data source which breaks down grade into each of the stone quality subdivisions and is also considered by the CP to be the most robust and reliable representation of grade, given the large sample sizes upon which the average grades for each production pit are based. Gravel bed tonnage and grade production records, however, include mining dilution which is significant given the relatively thin gravel beds and the desire to achieve total recovery during mining. All production and stockpile tonnages, are reported as dry tonnages.

The CP's in-situ gravel bed model is based on logging and measurements taken directly from auger holes and exploration pitting. In order to use production tonnage and grade to derive equivalent in-situ gravel bed tonnage and grade, factors for each need to be applied to the production records to remove the effect of dilution.

The amount of dilution planned to be incurred by mining was calculated by comparing the volume of gravel bed to the volume of gravel bed and planned dilution skin (Table 4-6). The mine plans to ensure complete recovery of the gravels by mining a minimum thickness of 1.5m. Where the gravel is thicker than 0.9m then a skin of 0.3m of over-dig is planned on both the footwall and the hangingwall. The planned mining dilution from the application of minimum thickness and skin is a function of gravel bed thickness, for example a thickness of 0.2m results in a factor of 7.5 and a thickness of 0.4m results in a planned dilution factor of 3.75.

The CP has calculated this factor separately for each domain. The final factors applied to the production grades, were based on the total ratio of all Mugloto Domains, applied to all Mugloto production pit grades and the total ratio of all Glass / Maninge Nice Domains, which was applied to all Glass and Maninge Nice pit grades.

Table 4-6: Determination of skin / gravel bed factor from modelled block volumes

Domain	Modelled Gravel Bed (m^3)	Modelled Gravel Bed + skin (m^3)	Factor: Gravel Bed / Skin	Production Pits Factor Applied to
Mugloto	1,179,341	6,754,888	5.73	-
Mugloto West	481,208	3,138,747	6.52	-
Mugloto East	541,751	4,904,291	9.06	-
Mugloto South	159,673	1,104,584	6.92	-
Total Mugloto	**2,361,972**	**15,902,509**	**6.73**	**All Mugloto Production Pits**
Glass / Maninge Nice	1,137,331	5,875,741	5.17	-
Maninge Nice Pit 3	70,870	319,767	4.51	-
Maninge Nice East	1,868,964	6,753,877	3.57	-
Glass East	244,532	1,597,913	6.54	-
Total Maninge Nice / Glass	**3,321,697**	**14,547,297**	**4.36**	**All Glass and Maninge Nice Production Pits**

In order to determine how the planned mining dilution compares with actual mining dilution, the CP has reviewed the production data from all of the bulk sampling pits and mining areas as supplied by MRM and compared this to the planned amount of gravel bed and skin dilution in each area based on the model. The volumes, converted to tonnages are shown in Table 4-7.

Table 4-7: Tonnages of gravel bed per bulk sampling pit, compared to production data

Pit Name	Material Type	Material Mined (including dilution) (dry t)	Gravel Bed Modelled (t)	Gravel Bed + skin Modelled (t)
Mugloto Pit 2	Gravel Bed	50,835	19,294	65,076
Mugloto Pit 3	Gravel Bed	1,047,625	161,084	589,527
Mugloto Pit 3E	Gravel Bed	101,687	10,626	62,316
Mugloto Pit 5	Gravel Bed	274,573	27,208	155,034
Mugloto Pit 8	Gravel Bed	21,565	2,896	16,306
Mugloto Pit 9	Gravel Bed	49,673	377	10,081
Maninge Nice Pit 3 (Secondary)	Gravel Bed	372,630	48,636	169,474
Maninge Nice Pit 5	Gravel Bed	41,667	340	1,062
Glass A Pit 1	Gravel Bed	457,057	56,607	344,694
Glass B Pit 1	Gravel Bed	30,272	6,965	14,330

** Note that any production pits that do not overlap with modelled gravel bed in the area from which gravel bed has been extracted are not included in this table. Likewise, production pits from which gravel bed has been extracted, but not yet processed, are also not included.*

*** All tonnages relate to production up to 31 December 2017, other than Maninge Nice Pit 5 tonnage (which forms part of the Glass Maninge Nice Domain), which relates to production up to 31 August 2018.*

For all but Mugloto Pit 2, the production tonnage is in excess of what is predicted by the model. This is considered to be a function of the drill hole spacing, which is often wider than the dimensions of the production pits. Whilst the CP's model is suitable for long term mine planning, it is evident that small scale variations to the gravel bed model are identified when mining, allowing some additional areas to be mined. These variations do not affect the CP's resource model at the large scale.

The planned dilution factor was used to derive undiluted grade in the gravel bed model based on the diluted grade in the production records.

For example, the average total diluted grade recovered from Mugloto Pit 5 is 10.25 ct/t. The planned dilution facto for the Mugloto area, is 6.73. To convert the Mugloto Pit 5 diluted grade to an in-situ grade, the diluted grade of 10.25 ct/t was multiplied by the factor of 6.73 to derive an in-situ grade of 69.01 ct/t. This is illustrated in Table 4-8 to Table 4-11.

Table 4-8 displays the diluted total production grades and the CP's undiluted grade for each pit. Table 4-9 shows the resulting grades broken down by stone type.

displays the average diluted grade (weighted by the head feed tonnage reported for each pit) and the CP's weighted undiluted grade for each domain. Table 4-11 shows the resulting undiluted grades for each domain, broken down by stone type. No factor was used for the amphibolite grades, as this is not a consideration for the mining of the primary material.

Table 4-8: Application of factor to production grades per pit, to estimate in-situ grades.

Pit Name	Material Type	Total Grade from Production (ct/t)	Factor GB / Skin	In-situ Total Grade
Pit 2	Gravel Bed	2.06	6.73	13.87
Pit 3	Gravel Bed	2.37	6.73	15.96
Pit 3E	Gravel Bed	3.85	6.73	25.89
Pit 5	Gravel Bed	10.25	6.73	69.01
Pit 7	Gravel Bed	40.61	6.73	273.30
Pit 8	Gravel Bed	2.03	6.73	13.69
Pit 9	Gravel Bed	0.72	6.73	4.87
Glass A Pit 1	Gravel Bed	2.27	4.36	9.89
Glass B Pit 1	Gravel Bed	3.01	4.36	13.20
Maninge Nice Pit 3	Gravel Bed	63.39	4.36	277.63
Maninge Nice Pit 5	Gravel Bed	1.54	4.36	6.75
Maninge Nice Pit3	Amphibolite	97.88	-	

Table 4-9: Calculated In-situ grades for each stone type per pit

Pit	Material Type	Recovered Grade (ct/t)	Premium Ruby (ct/t)	Ruby (ct/t)	Low Ruby (ct/t)	Corundum (ct/t)	Sapphire (ct/t)	Low Sapphire (ct/t)	<4.6mm (ct/t)
Pit 2	Gravel Bed	13.87	0.20	1.10	1.12	0.75	7.60	0.00	3.10
Pit 3	Gravel Bed	15.96	1.81	6.02	0.68	0.68	2.35	2.54	1.87
Pit 3E	Gravel Bed	26	0.47	1.66	0.93	11.67	5.13	6.03	0.00
Pit 5	Gravel Bed	69.01	0.27	1.03	1.01	1.38	8.54	51.47	5.32
Pit 7	Gravel Bed	273.30	0.21	0.42	3.54	12.59	12.97	235.42	8.14
Pit 8	Gravel Bed	13.69	0.18	5.09	0.32	2.98	0.90	2.61	1.61
Pit 9	Gravel Bed	4.87	0.99	3.14	0.04	0.11	0.13	0.46	0.00
Glass A Pit 1	Gravel Bed	9.89	0.25	1.30	0.61	0.82	4.04	1.08	1.79
Glass B Pit 1	Gravel Bed	13.14	0.06	0.09	0.57	1.92	0.75	8.83	0.93
Maninge Nice Pit 3	Gravel Bed	276.37	0.06	13.92	26.40	38.74	107.20	29.96	60.08
Maninge Nice Pit 5	Gravel Bed	6.72	0.24	2.58	0.22	1.34	0.52	1.82	0.00
Maninge Nice Pit3	Amphibolite	97.9	0.003	3.7	6.5	4.8	50.7	-	32.2

Table 4-10: Application of factor to production grades per domain, to estimate in-situ grades.

Domain Name	Material Type	Total Grade from Production (ct/t)	Factor GB / Skin	In-situ Total Grade
Mugloto	Gravel Bed	2.59	6.73	17.44
Mugloto West	Gravel Bed	40.61	6.73	273.30
Mugloto East	Gravel Bed	No Production Data Available	-	-
Mugloto South	Gravel Bed	No Production Data Available	-	-
Glass / Maninge Nice	Gravel Bed	2.33	4.36	10.16
Maninge Nice Pit 3	Gravel Bed	63	4.36	276
Maninge Nice East	Gravel Bed	No Production Data Available	-	-
Glass East	Gravel Bed	No Production Data Available	-	-
Maninge Nice Amphibolite	Amphibolite	97.9	-	97.9

Table 4-11: Calculated In-situ grades for each stone type per domain

Domain	Material Type	Recovered Grade (ct/t)	Premium Ruby (ct/t)	Ruby (ct/t)	Low Ruby (ct/t)	Corundum (ct/t)	Sapphire (ct/t)	Low Sapphire (ct/t)	<4.6mm (ct/t)
Mugloto	Gravel Bed	17.44	1.66	5.60	0.70	0.83	2.70	3.97	1.97
Mugloto West	Gravel Bed	273.30	0.21	0.42	3.54	12.59	12.97	235.42	8.14
Mugloto East	Gravel Bed	-	-	-	-	-	-	-	-
Mugloto South	Gravel Bed	-	-	-	-	-	-	-	-
Glass / Maninge Nice	Gravel Bed	10.16	0.23	1.21	0.59	0.95	3.62	1.89	1.66
Maninge Nice Pit 3	Gravel Bed	276.37	0.063	13.92	26.40	38.74	107.20	29.96	60.08
Maninge Nice East	Gravel Bed	-	-	-	-	-	-	-	-
Glass East	Gravel Bed	-	-	-	-	-	-	-	-

4.5.2 Grade Assignment

Overall, the grade actually produced from each production pit typically far exceeds the grade estimated from exploration data alone as described in Section 4.2.1. In the CP's opinion this is a consequence of the small volume of exploration samples being insufficient to adequately fully represent the statistical distribution of grades. In reality, the distribution is skewed by small pockets of very high-grade material which are missed by exploration samples but which contribute to production statistics once large volumes have been mined.

For this reason, and because production data further details the stone quality breakdown, the grades assigned to the Mineral Resource model are derived primarily from production grades. For those domains that have no production data, then production data from neighbouring domains has been used but factored pro rata with average exploration data grades in each domain.

Grades have been assigned to the gravel bed block model in each of the domains outlined in Section 4.4. For each domain the grade and stone quality breakdown from production records in that domain has been assigned to the gravel bed blocks based on the following criteria:

- Within 100 m of each production pit perimeter, the gravel bed blocks have been assigned the factored un-diluted grade of the corresponding pit, as detailed in Table 4-9;
- Where a gravel bed block is within 100 m of at least two production pits, the block has been assigned the factored un-diluted grade of the nearest production pit;
- For domains that include at least one production pit, blocks more than 100 m from a production pit have been assigned the average undiluted production grade of all pits inside the corresponding domain weighted by the head feed tonnage reported for each pit, as detailed in Table 4-11;
- For domains that do not include any production data, grade and stone quality breakdown has been assigned using the average grade and quality breakdown of the nearest domain with available production data. The production grade has been factored pro rata with the average modelled exploration grades (as described in Section 4.2.1) in each domain. For example, the Mugloto East domain does not contain any production data and the average ruby grade based on exploration data is 2.02 ct/t. The nearest domain with production data is Mugloto whose average ruby grade based on exploration data is 5.39 ct/t. The ratio of exploration derived grade from the Mugloto East domain to the Mugloto domain is 0.35. This factor has been applied to the Mugloto Domain undiluted production grade (17.44 ct/t) to derive the undiluted production grade for Mugloto East (6.10 ct/t). The factors applied and resulting grades are detailed in Table 4-12;
- For all domains, the waste blocks and gravel bed dilution skin blocks have been assigned a total grade of 0.

Table 4-12: Total undiluted ruby grades by domain.

Domain	Exploration Grade (a *)	Production Grade (b *)	Production Grade Source Domain (c *)	Exploration Grade Factor (d *)	Resultant MRE block grade (e *)
Mugloto	5.39	17.44	Mugloto	N/A	17.44
Mugloto West	14.08	273.30	Mugloto West	N/A	273.30
Mugloto East	2.02	-	Mugloto	0.35	6.10
Mugloto South	0.52	-	Mugloto	0.1	1.74
Glass / Maninge Nice	6.93	10.16	Glass / Maninge Nice	N/A	10.16
Maninge Nice Pit 3	4.68	276.37	Maninge Nice Pit 3	N/A	276.37
Maninge Nice East	2.17	-	Glass / Maninge Nice	0.3	3.05
Glass East	0.21	-	Glass / Maninge Nice	0.05	0.51

** Table 4-12 Column name descriptions:*

a *- Mean modelled total grade from auger holes & exploration pits (ct/t).*

b *- Average (head feed weighted) undiluted production grade of all production pits inside the domain (ct/t).*

c *- Nearest domain with available production data.*

d *- Ratio between the average ruby grades modelled from auger drilling and exploration pits (as described in Section 4.2.1) in this domain and the corresponding grade in the nearest domain with available production data (rounded to the nearest 0.05).*

e *– Final total ruby grade (ct/t) applied to the gravel bed blocks (for blocks more than 100 m from a production pit).*

The grade assignment is detailed on a domain by domain basis below:

Mugloto Domain:

Within 100 m of each production pit, the gravel bed blocks have been assigned the factored un-diluted grade of the corresponding pit. Blocks more than 100 m from a production pit have been assigned the average (weighted by head feed tonnage) factored undiluted production grade of all pits inside the Mugloto domain.

Mugloto West Domain:

Grade and quality breakdown consistent throughout the domain and based on the factored un-diluted grade from production of Mugloto Pit 7.

Mugloto East Domain:

No production data available. Grade and stone quality breakdown assigned based on multiplying the average (weighted by head feed tonnage) undiluted production grade of all pits inside the Mugloto domain by a factor of 0.35. The factor is based on the average ruby grades modelled from auger drilling and exploration pits in the Mugloto East Domain (2.0 ct/t), divided by the corresponding grade in the Mugloto Domain (5.4 ct/t).

Mugloto South Domain:

No production data available. Grade and stone quality breakdown assigned based on multiplying the average (weighted by head feed tonnage) undiluted production grade of all pits inside the Mugloto domain by a factor of 0.1. The factor is based on the average ruby grades modelled from auger drilling and exploration pits in the Mugloto South Domain (0.5 ct/t), divided by the corresponding grade in the Mugloto Domain (5.4 ct/t).

Glass / Maninge Nice Domain:

Within 100 m of each production pit, the gravel bed blocks have been assigned the factored un-diluted grade of the corresponding pit. Blocks more than 100 m from a production pit have been assigned the average (weighted by head feed tonnage) factored undiluted production grade of all pits inside the Glass / Maninge Nice domain.

Maninge Nice Pit 3 Domain:

Grade and quality breakdown consistent throughout the domain and based on the factored un-diluted grade from production of the gravel bed in Maninge Nice Pit 3.

Maninge Nice East Domain:

No production data available. Grade and stone quality breakdown assigned based on multiplying the average (weighted by head feed tonnage) undiluted production grade of all pits inside the Glass / Maninge Nice domain by a factor of 0.3. The factor is based on the average ruby grades modelled from auger drilling and exploration pits in the Maninge Nice East Domain (2.2 ct/t), divided by the corresponding grade in the Glass / Maninge Nice Domain (6.9 ct/t).

Glass East Domain:

No production data available. Grade and stone quality breakdown assigned based on multiplying the average (weighted by head feed tonnage) undiluted production grade of all pits inside the Glass / Maninge Nice domain by a factor of 0.05. The factor is based on the average ruby grades modelled from auger drilling and exploration pits in the Glass East Domain (0.2 ct/t), divided by the corresponding grade in the Glass / Maninge Nice Domain (6.9 ct/t).

Maninge Nice Amphibolite Domain:

The grades and tonnages assigned to Maninge Nice Pit 3 Amphibolite Domain this domain relate to diamond drilling and production completed to date. The grade and quality breakdown has been applied consistently throughout the domain, based on the average production grade from the amphibolite in Maninge Nice Pit 3.

Table 4-13: Final undiluted grades assigned to the gravel bed blocks for all estimation domains

Domain	Material Type	Total Grade (ct/t)	Premium Ruby (ct/t)	Ruby (ct/t)	Low Ruby (ct/t)	Corundum (ct/t)	Sapphire (ct/t)	Low Sapphire (ct/t)	<4.6mm (ct/t)
Mugloto	Gravel Bed	17.44	1.66	5.60	0.70	0.83	2.70	3.97	1.97
Mugloto West	Gravel Bed	273.30	0.21	0.42	3.54	12.59	12.97	235.42	8.14
Mugloto East	Gravel Bed	6.10	0.58	1.96	0.24	0.29	0.95	1.39	0.69
Mugloto South	Gravel Bed	1.74	0.166	0.56	0.070	0.083	0.27	0.40	0.20
Glass / Maninge Nice	Gravel Bed	10.16	0.23	1.21	0.59	0.95	3.62	1.89	1.66
Maninge Nice Pit 3	Gravel Bed	276.37	0.063	13.92	26.40	38.74	107.20	29.96	60.08
Maninge Nice East	Gravel Bed	3.05	0.070	0.36	0.18	0.28	1.09	0.57	0.50
Glass East	Gravel Bed	0.51	0.012	0.060	0.030	0.047	0.18	0.09	0.083

The gravel bed blocks, coloured by total ruby grade and premium ruby grade are displayed in Figure 4-12 and Figure 4-13 respectively.

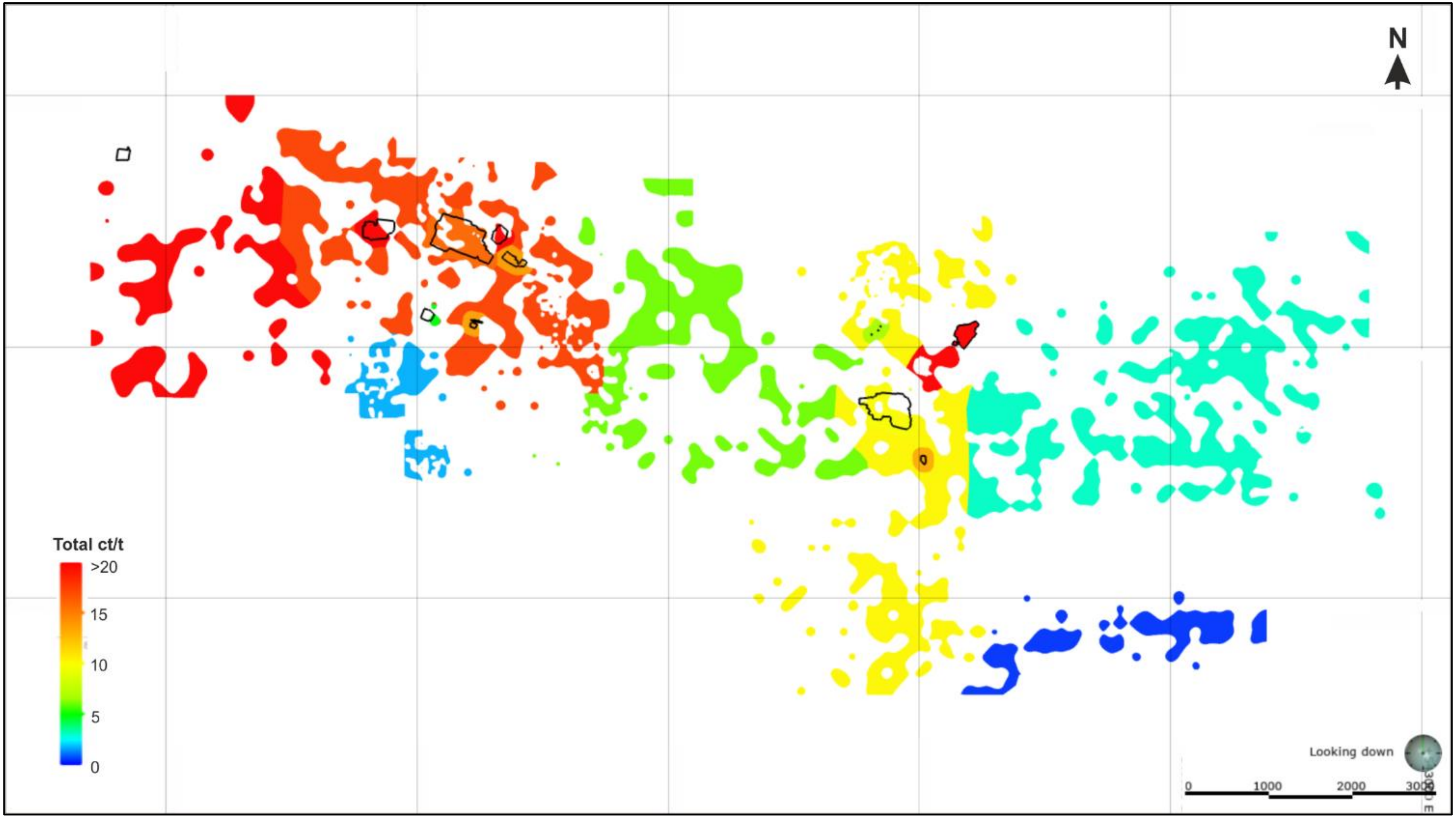

Figure 4-12: Gravel Bed blocks coloured by assigned un-diluted total ruby grades (ct/t). The extent of gravel bed extraction for all production pits with processed gravel bed are displayed as black outlines.

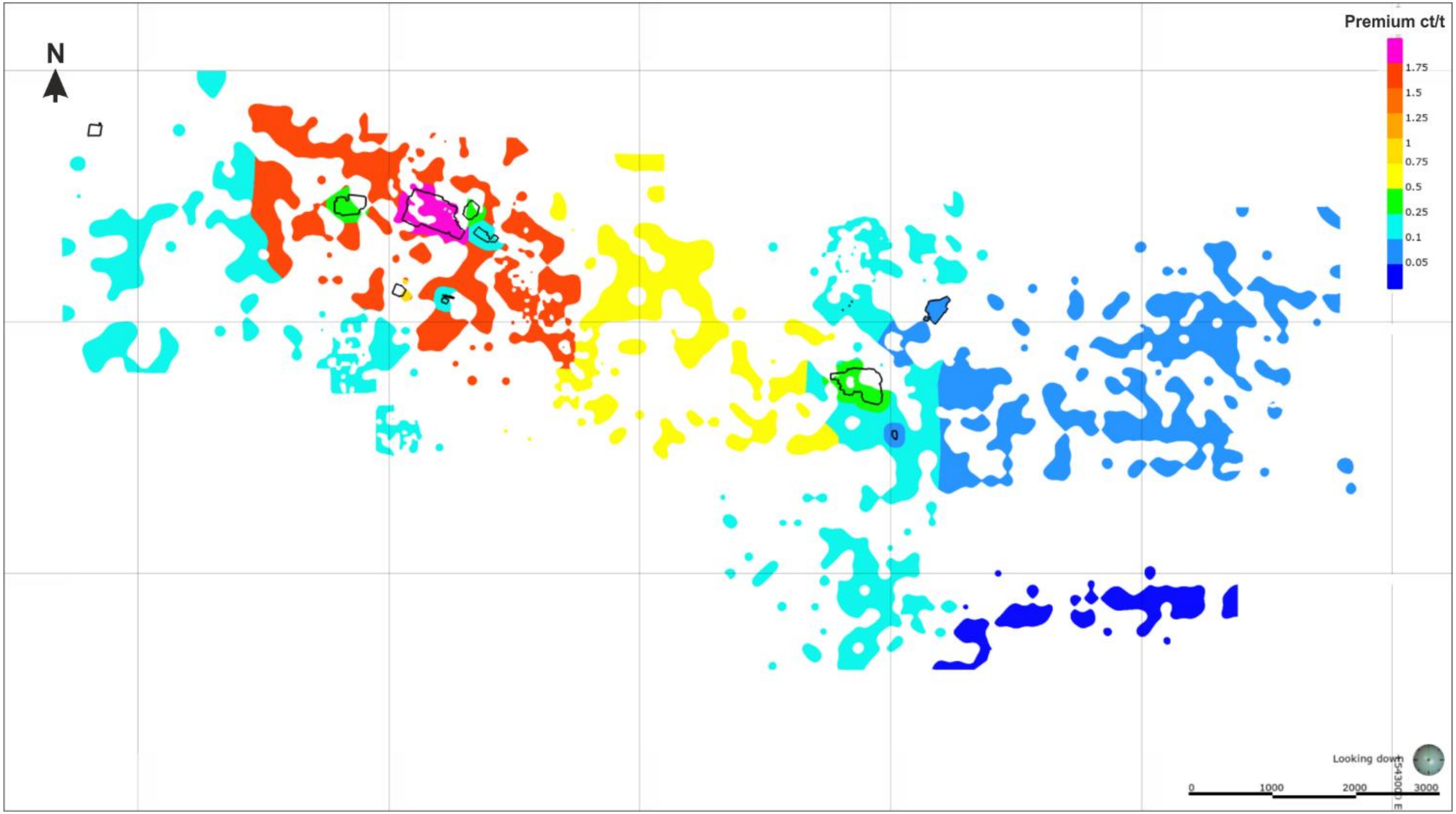

Figure 4-13: Gravel Bed blocks coloured by assigned un-diluted premium ruby grades (ct/t). The extent of gravel bed extraction for all production pits with processed gravel bed are displayed as black outlines.

4.5.3 Density and Tonnage Estimation

To generate a tonnage estimate, the CP has applied the average in situ density values, as derived from the core sampling. The density values applied by mineralisation type are shown in Table 4-10. Upon review of the available density data for the gravel bed material, the CP noted 5 samples which had abnormally high-density values reported and these were excluded from the dataset.

Table 4-14: In-situ density data and modelled values

Material Type	Number Samples	Density Value (g/cm3)
Gravel Bed	31	2.01
Amphibolite	108	2.53

4.5.4 Artisanal Mining Activities

The Concession Area has been subject to exploitation by illegal artisanal miners in various areas, focussed on both the relatively easily accessible shallow secondary gravel bed mineralisation, as well as the underlying primary mineralisation present within north-south orientated river channels in the Maninge Nice and Ntorro areas and in the weathered amphibolite at Maninge Nice. As MRM improved security at Maninge Nice in 2012, the focus of the artisanal activity shifted to the lower grade, higher quality secondary mineralisation in the central Mugloto area. MRM has since further increased security measures across the Concession Area in order to gain a degree of control over the artisanal mining activities and to prevent excessive additional removal of material from the deposit. The CP considers the current security arrangements on site to be appropriate.

Through field mapping and interpretation of satellite imagery, MRM has mapped the broad areas affected by artisanal activity (Figure 4-8). These areas are typically sporadically dotted with small artisanal pits, on average approximately 1.3 m deep and 1.1 m wide. In order to ascertain the percentage of the total ruby / corundum mineralisation extracted by the artisanal workers within the broad outlines mapped by MRM, a detailed mapping programme of the artisanal excavations was completed by MRM staff in March 2015. This involved the selection of a number of representative areas within the artisanal outlines (Figure 4-8), across the Project area, and systematic tracing of these areas on foot in order to record the following information:

- Number of artisanal pits within the sample area.
- The average area (length*width) of each pit.
- The average depth of each pit.

This was completed over 7 sample areas, each covering an area of 10,000 m^2. The results, presented in Table 4-11, suggest that within the broad artisanal outlines mapped by MRM, approximately 2 to 6% ruby / corundum mineralisation has been removed by artisanal workers. In this region, artisanal mining is typically to the base of the gravel bed only, without lateral extensions under the surface. MRM monitors the artisanal mining activity in neighbouring areas, to ensure that the assumptions regarding depletion remain relevant. The average volume removed by artisanal mining activity was subtracted from the blocks within the areas mapped as being affected by mining.

Table 4-15: Artisanal pitting statistics within the artisanal outline sample areas

Area	Sample area (m2)	Number of artisanal pits	Average pit area (m2)	Average pit depth (m)	Total pitted area (m2)	Pitted area (%)
A	10,000	279	1.43	6.5	399	4.0
B	10,000	308	1.56	4.0	480	4.8
C	10,000	373	1.56	3.5	582	5.8
D	10,000	341	1.56	3.5	532	5.3
E	10,000	271	0.90	6.0	244	2.4
F	10,000	278	1.54	3.0	428	4.3
G	10,000	312	1.54	3.0	480	4.8
Total / Average	70,000	2,162	1.44	4.2	3,146	4.5

Figure 4-14: Plan view of the broad areas affected by artisanal excavation (in grey) in the area of the MRM bulk sampling operations (existing pits in orange): sample areas A-G are outlined in black.

4.6 Mining Depletion

In order to reflect depletion of the mineralisation by production to date, the CP has depleted the final block model for all gravel bed domains, based on pit surveys, to reflect the effective date of the Mineral Resource of 31 August 2018. This was completed by through the following:

- All gravel bed domains depleted based on the outline of extracted gravel bed in the pit surveys / maps, treated as a vertical wall to code the mining depletion into the gravel bed blocks (Figure 4-15); and
- The Maninge Nice Pit 3 Amphibolite Domain was depleted to reflect mining up to 1 January 2018. As no mining has been completed in this area since then, the declared Mineral Resources for this domain have an effective date of 31 August 2018, consistent with the gravel bed domains.

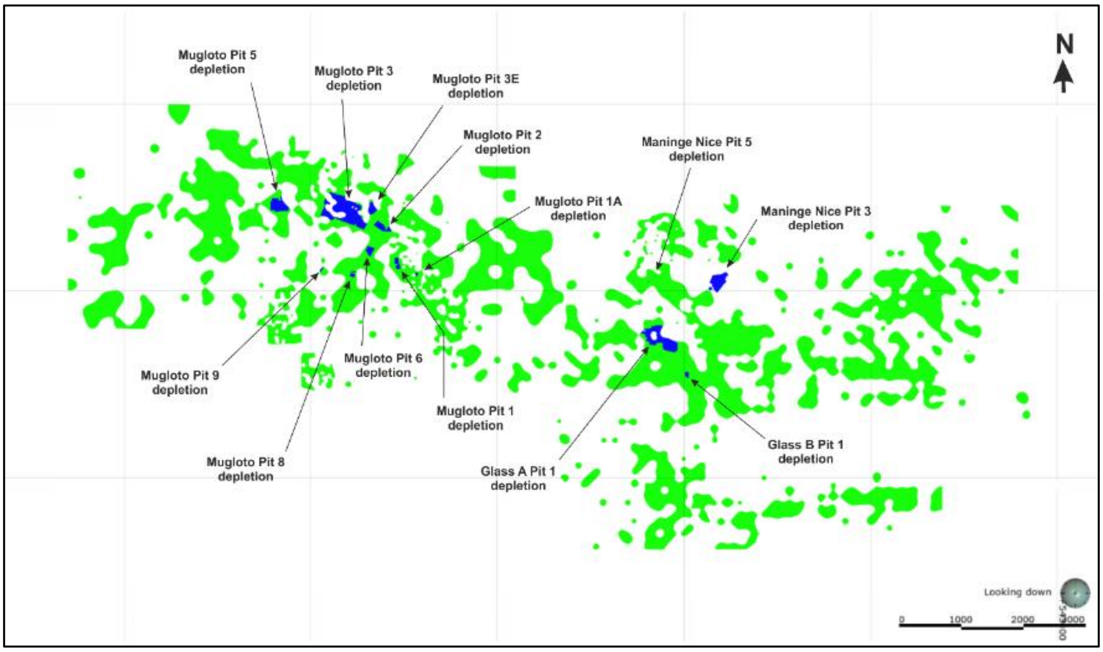

Figure 4-15: The gravel bed model coloured and labelled by mining depletion, with green areas being unmined, and blue, reflecting areas of depletion

4.7 Mineral Resource Classification

4.7.1 Introduction

The CP notes that the exploration and production activities completed by Gemfields since the commencement of the mine have improved the geological knowledge and understanding of the Montepuez deposit and the availability of historical production statistics supplemented with extensive exploration data has resulted in an improved understanding of overall grade distribution.

Evidence gathered from the detailed exploration, production, and geological modelling has provided a sufficient level of understanding and confidence in the geological and grade continuity to support the classification applied. This section describes the data analysis and considerations taken into account by the CP when deriving the classification of the Mineral Resources at each of the deposits.

4.7.2 Reporting Code Definitions

The following are taken from the SAMREC Code (2016), for reference:

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve.

It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

Where the Mineral Resource being reported is predominantly an Inferred Mineral Resource, sufficient supporting information must be provided to enable the reader to evaluate and assess the risk associated with the reported Mineral Resource.

An Inferred Mineral Resource can be based on interpolation between widely spaced data where there is reason to expect geological continuity of mineralisation. The extent of extrapolation outside of the nominal drill or sampling grid spacing must be justified. The report must contain sufficient information to inform the reader of:

- the maximum distance that the Mineral Resource is extrapolated beyond the sample points;
- the proportion of the Mineral Resource that is based on extrapolated data;
- the basis on which the Mineral Resource is extrapolated to these limits; and
- a diagrammatic representation of the Inferred Mineral Resource showing clearly the extrapolated part of the estimated Resource.

An Indicated Mineral Resource is that part of a Mineral 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.

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 Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve. An Indicated Mineral Resource has a higher level of confidence than that applying to an Inferred Mineral Resource.

A deposit or part of a deposit may be classified as an Indicated Mineral Resource when the nature, quality, amount and distribution of data are such as to allow the Competent Person determining the Mineral Resource to confidently interpret the geological framework and to assume physical and grade continuity of mineralisation. Confidence in the estimate is sufficient to allow the appropriate application of technical and economic parameters to prepare incremental mine plans and production schedules and to enable an evaluation of economic viability. Overall confidence in the estimates is high, while local confidence is reasonable. The Competent Person should recognise the importance of the Indicated Mineral Resource category in the advancement of the feasibility of the project.

An Indicated Mineral Resource estimate should be of sufficient quality to support detailed technical and economic studies leading to Probable Mineral Reserves which can serve as the basis for development decisions. It is imperative that data exists in the area of the Indicated Mineral Resource.

A Measured Mineral Resource is that part of a Mineral 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.

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 Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Mineral Reserve or to a Probable Mineral Reserve.

A Measured Mineral Resource requires that the nature, quality, amount and distribution of data are such as to leave the Competent Person with no reasonable doubt that the tonnage and grade of the mineralisation can be estimated to within close limits and any variation within these limits would not materially affect the economics of extraction. This category requires a high level of confidence in, and understanding of, the geology and the controls on mineralisation.

A Measured Mineral Resource estimate should be of sufficient quality to support detailed technical and economic studies leading to Mineral Reserves which can serve as the basis for major development decisions.

Mineral Resource classification is a matter for skilled judgement and a Competent Person should take into account those items in Table 1 that relate to confidence in Mineral Resource estimation.

In many cases it will be understood that overall tonnages, densities, shapes, physical characteristics, grades or qualities and mineral contents can be estimated with higher levels of confidence, and local tonnages, densities, shapes, physical characteristics, grades or qualities and mineral contents can be estimated only with lower levels of confidence, insufficient for detailed mine planning.

The Competent Person should take into consideration issues of the style of mineralisation and cut-off grade when assessing geological and grade continuity for the purposes of classifying the Mineral Resource. Cut-off grades chosen for the estimation should be realistic in relation to the style of mineralisation and the anticipated mining and metallurgical development options.

4.7.3 Classification strategy and assumptions

The CP has made a series of assumptions with the mineralising system at the Montepuez deposit. The CP has assumed that characteristics of the host lithology, whether primary amphibolite or secondary gravel bed remain constant to extents of the modelled unit with no changes in geology. Similarly, it is assumed that there is no changing in the mineralising system with depth. The host mineralisation was modelled using a combination of the regional scale interpretation, in-pit mapping, and available drill hole, auger, and exploration pit intersections.

Grade data is sourced from historical production data, either directly, or indirectly (where no production data is available in the vicinity) based on factoring production grades with data from auger drilling and exploration pitting, as described in Section 4.5.2. Grade estimates are therefore largely dependent on historical data for validation.

In order to classify the Mineral Resources at Montepuez, the CP has taken the following factors into account:

1. quantity and quality of the underlying data, the level of geological understanding for each type of mineralisation, and across the property as a whole;
2. confidence in the geological continuity of the host mineralisation;
3. confidence in the grades, as derived from the production and the understanding of the grade variation at a given production scale; and
4. the perceived level of risk associated with deviations from the assumptions made.

4.7.4 Classification

The CP has classified the Mineral Resources at Montepuez on a domain by domain basis. Specifically, the following the domains are classified as described below:

Indicated Mineral Resources:

The CP has classified all gravel bed blocks inside of the Mugloto Domain, the Maninge Nice Pit 3 Domain and the Glass / Maninge Nice Domain (north of 8551200) as Indicated Mineral Resources.

All three domains are intersected by auger drilling and exploration pitting of a sufficient spacing to derive the outline of the gravel bed to an appropriate level of confidence for long term planning. Specifically:

- the Mugloto Domain is tested by auger drilling on a regular grid of 140 m, with small clusters of drilling at a tight spacing of approximately 35 m, whilst exploration pitting completed in the Mugloto Domain has been completed at a spacing of 50 m;
- in the Glass / Maninge Nice Domain, auger drilling is completed on a 140 m grid, with additional clusters of exploration pitting on an approximate 100 m grid;

- the Maninge Nice Pit 3 Domain has not been subject to any auger drilling, however exploration pitting has been completed in this domain at a spacing of between 100 m and 200 m and addition domain has been subject to considerable production.

For all three domains, the drilling and exploration pitting to date has allowed for the construction of a gravel bed wireframe, which indicates reasonable consistency in the thickness and presence of gravel bed between holes / pits. The results of the close spaced auger drilling and exploration pitting completed in the Mugloto Domain, indicate that gravel bed is continuous over sufficient distances for the wider spaced drilling completed across the domains to be appropriate to define the continuity of the gravel bed to a sufficient level of confidence for the classification of Indicated Mineral Resources.

By domaining the gravel bed model as described in Section 4.4, the modelled unit has been divided into zones each with relatively homogeneous grade and geological characteristics. This results in greater confidence in the grades assigned to the areas classified as Indicated Mineral Resources by avoiding extrapolation of grade across geologically distinct areas. Specifically, the Mugloto and Glass / Maninge Nice domains are defined by internally consistent modelled grade profiles (from the auger drilling and exploration pitting, as described in Section 4.2.1) and each border a single major paleo drainage channel. Although not used directly to inform the block model ruby grades, the modelled ruby grades from auger drilling and exploration pitting add weight to the definition of distinct domains.

All three domains, which have been classified as Indicated Mineral Resources, have been the focus of significant production. Complete grade recovery data is available for 6 production pits in the Mugloto Domain and 3 production pits in the Glass / Maninge Nice Domain. Grade recovery data is only available for 1 production pit in the Maninge Nice Pit 3 Domain, however the production to date from this pit represents a relatively large proportion of the total domain. For these domains, the total tonnage of material extracted and processed is considered to be appropriate to derive a representative grade for the remainder of the domain. This supports an estimate of the overall domain grades to a sufficient level of confidence to support classification of Indicated Mineral Resources. The tonnage of mineralised material extracted and processed from each Indicated domain is compared to the model tonnage in Table 4-16.

Table 4-16: The proportion of mineralisation extracted and processed in the gravel bed domains, classified as Indicated Mineral Resources.

Domain	Number of Pits (a *)	Mined Tonnage (b *)	Processed Tonnage (c *)	Remaining Resource (d *)	Proportion Extracted (e *)	Proportion Processed (f *)
Mugloto Domain	6	1,596,439 t	1,241,848 t	12,566,529 t	11%	9%
Glass / Maninge Nice Domain (north of 8551200)	3	544,086 t	51,457 t	6,474,481 t	8%	1%
Maninge Nice Pit 3 Secondary Domain	1	372,630 t	362,464 t	469,689 t	44%	43%

** Table 4-16 column name descriptions:*

a *- No. of Production Pits.*

b *– Mineralised material tonnage (including dilution) extracted from production pits*

c *- Processed mineralised material tonnage including dilution*

d *- Remaining Indicated mineralised material including dilution skin (according to the model presented herein).*

e *– Proportion of mineralised material extracted from the Indicated Domains.*

f *– Proportion of mineralised material processed from the Indicated Domains.*

All tonnages relate to production up to 31 August 2018.

For the primary amphibolite material, the classification of Indicated Mineral Resources is supported by relatively close spaced drilling, production data, and in-pit mapping. These aspects, in conjunction with the understanding and confidence in the geological and grade continuity, are sufficient to support the classification of Indicated Mineral Resources, as applied. Areas which are less well supported by drilling, are classified as Inferred Mineral Resources.

Inferred Mineral Resources:

The CP has classified all gravel bed blocks in the Mugloto West, Mugloto South, Mugloto East, Glass / Maninge Nice (south of 8551200), Maninge Nice East and Glass East domains as Inferred. These domains are characterised by a similar drill hole spacing to the Indicated domains, and confidence in the distribution of the modelled gravel bed is comparable. Specifically, the Maninge Nice East, Glass East and Glass / Maninge Nice (south of 8551200) domains and the southern portion of the Mugloto East Domain are tested by auger drilling on an approximate 140 m grid. The Mugloto West Domain and the northern portion of the Mugloto East Domain are drilled on approximate 200 m grids. The Mugloto South Domain is primarily modelled on the basis of exploration pitting, completed on a close spaced grid of 50 m.

The primary basis for the Inferred classification of these domains is the presence of exploration data and lack of associated production data to derive the assigned grades. The grade of the Mugloto Pit 7 Domain is based on a relatively small volume of production from Mugloto Pit 7, whilst the grade of southern portion of the Glass / Maninge Nice Domain is based on production data from the northern portion of this domain (no production data is available for the southern portion of the Glass / Maninge Nice Domain). The grade of all other Inferred gravel bed domains has been assigned based on factoring on the average grade and quality breakdown of the nearest domain with available production data, with the factor being based on the ratio between the average ruby grades modelled from auger drilling and exploration pits in the domain with production data and the domain without production data. Although the auger drilling and exploration pitting ruby grades are generally significantly lower than the corresponding production pit grades, in general, the production pits characterised by high total ruby grades correlate with increased interpolated ruby grades, and vice versa. It is therefore considered that this approach is suitable to assign grades to these domains at an Inferred confidence level.

4.8 Mineral Resource Statement

The Mineral Resource Statement for the Montepuez deposit is given Table 4-17 and Table 4-19. For reference, the Secondary Mineralisation Resources (excluding stockpiles), broken down by domain are provided in Table 4-18**.**

The Mineral Resource classification applied to the deposit is illustrated in Figure 4-16, where the Indicated Mineral Resources are coloured red, and the Inferred Mineral Resources are coloured green.

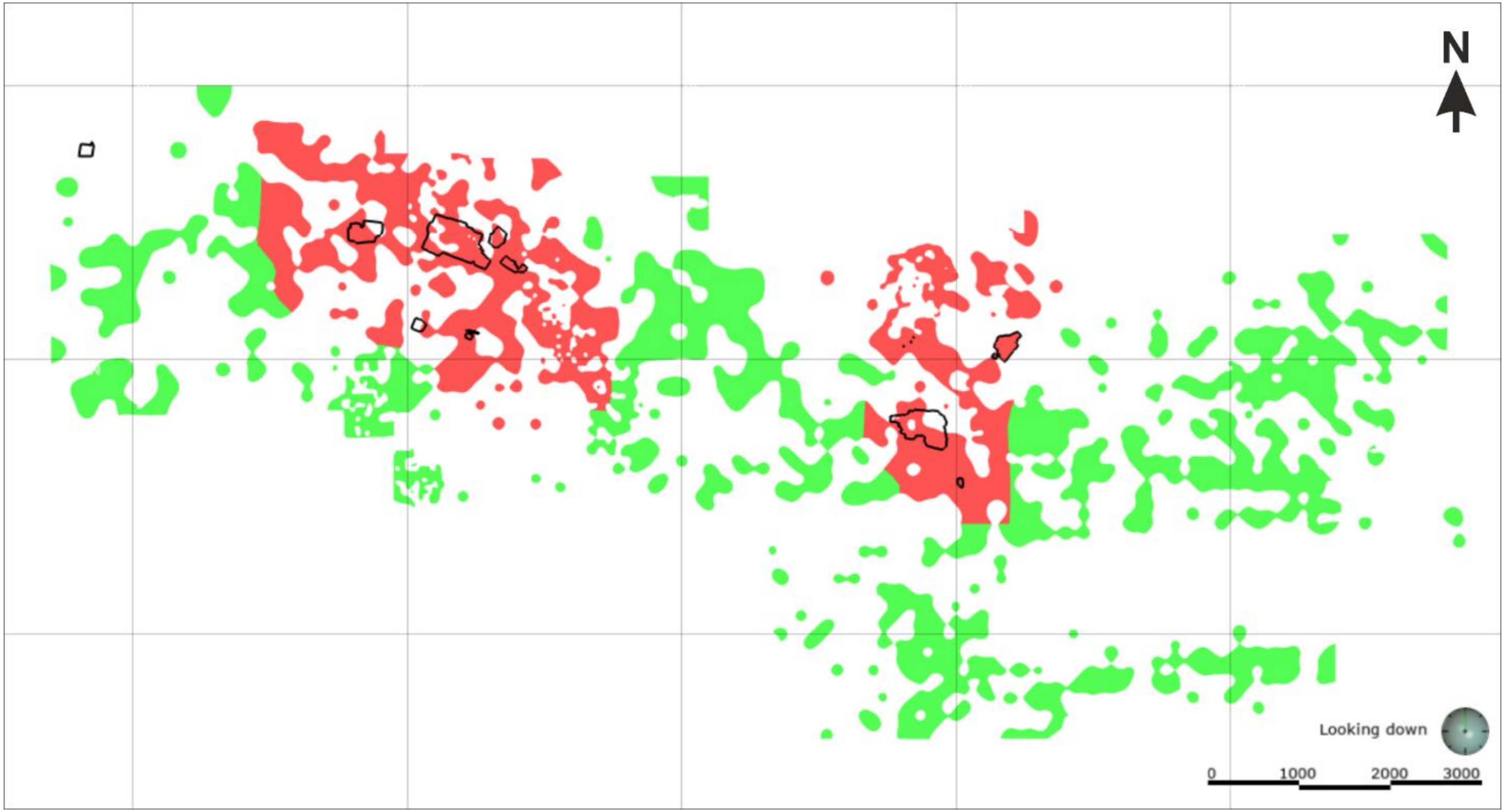

Figure 4-16: The block model coloured by classification with red = Indicated Mineral Resources and green = Inferred Mineral Resources. The extent of gravel bed extraction for all production pits with processed gravel bed are displayed as black outlines.

Table 4-17: Mineral Resource Statement, as at 31 August 2018, for the Montepuez ruby and corundum deposit – Secondary Mineralisation

Mineralisation Type	Classification	Density (g/cm3)	Tonnage (kt)	Premium Ruby Grade (ct/t)	Ruby Grade (ct/t)	LR+CO+SP+LS+4.6 Grade (ct/t)	Total Grade (ct/t)	Contained Carats (ct, 000)
Secondary	Indicated	2.01	19,500	0.2	0.7	3.1	4.0	78,900
	Inferred	2.01	39,800	0.03	0.1	7.1	7.3	290,100
Stockpiles - Secondary	Indicated	1.40	935	0.2	0.9	6.2	7.3	6,800
Total - Secondary	Indicated + Inferred	2.00	60,235	0.09	0.3	5.8	6.2	375,900

Note:
1 The average value of the ruby and corundum, as reported in the Mineral Resource Statement is USD17.23 /ct
2 Mineral Resource grades are quoted with a bottom cut-off stone size of 1.6mm

Table 4-18: Secondary Mineralisation Mineral Resources (excluding stockpiles) for the Montepuez ruby and corundum deposit, broken down by estimation domain.

Mineralisation Domain	Classification	Density (g/cm3)	Tonnage (kt)	Premium Ruby Grade (ct/t)	Ruby Grade (ct/t)	LR+CO+SP+LS+4.6 Grade (ct/t)	Total Grade (ct/t)	Contained Carats (ct, 000)
Mugloto	Indicated	2.01	12,600	0.3	0.9	1.8	3	37,700
	Inferred	2.01	-	-	-	-	-	-
Mugloto West	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	6,300	0.03	0.07	42	42	264,400
Mugloto East	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	9,900	0.06	0.2	0.4	0.7	6,600
Mugloto South	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	2,200	0.02	0.08	0.1	0.3	550
Glass / Maninge Nice	Indicated	2.01	6,500	0.05	0.3	2.1	2.4	15,500
	Inferred	2.01	4,900	0.03	0.2	1.2	1.4	6,900
Maninge Nice Pit 3	Indicated	2.01	500	0.01	2.8	52	55	25,800
	Inferred	2.01	-	-	-	-	-	-
Maninge Nice East	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	13,300	0.02	0.1	0.7	0.9	11,400
Glass East	Indicated	2.01	-	-	-	-	-	-
	Inferred	2.01	3,200	0.002	0.009	0.07	0.08	250

Table 4-19: Mineral Resource Statement, as at 31 August 2018, for the Montepuez ruby and corundum deposit – Primary Mineralisation

Mineralisation Type	Classification	Density (g/cm3)	Tonnage (kt)	Premium Ruby Grade (ct/t)	Ruby Grade (ct/t)	LR+CO+SP+LS+4.6 Grade (ct/t)	Total Grade (ct/t)	Contained Carats (ct, 000)
Primary	Indicated	2.53	1,100	0.003	3.7	94.2	97.9	107,700
	Inferred	2.53	240	0.003	3.7	94.2	97.9	23,500
Stockpiles – Primary	Indicated	1.40	47	0.003	3.7	94.2	97.9	4,600
Total Primary	Indicated + Inferred	2.49	1,387	0.003	3.7	94.2	97.9	135,800

Note:
1 The average value of the ruby and corundum, as reported in the Mineral Resource Statement is USD17.23 /ct
2 Mineral Resource grades are quoted with a bottom cut-off stone size of 1.6mm

In presenting this Mineral Resource, the following apply:

- Mineral Resources for the gravel bed are reported inclusive of dilution to reflect the anticipated mining method, which has a minimum mining with of 1.5m, or a total of 0.6m of dilution where the gravel bed is greater than 0.9m thick;
- Mineral Resources for Maninge Nice Pit 3 Primary amphibolite are reported as undiluted;
- The CP has depleted the final block model based on the most recent pit surveys, to reflect the effective date of the Mineral Resource of 31 August 2018;
- The average value of the ruby and corundum, as reported in the Mineral Resource Statement is USD17.23 /ct. The CP notes that the price assumptions used are conservative when compared to the prices received from the auction process to date. The assumed prices for the different products, as provided by Gemfields, are as follows:
  - Premium Ruby – USD800 /ct;
  - Ruby – USD25.00 /ct
  - Low Ruby – USD1.00 /ct
  - -4.6 mm – USD2.00 /ct
  - Corundum – USD0.10 /ct
  - Sapphire – USD0.03 /ct
- Premium ruby and normal ruby are presented individually whilst other classes are combined; these comprise low ruby, corundum, sapphire, low sapphire and -4.6mm mixed ruby / corundum combined (“LR+CO+SP+LS+4.6”). A total grade for all classes is also presented for clarity;
- Mineral Resources are quoted with a bottom cut-off size of 1.6mm, which is consistent with what can be recovered in the plant, and processed in the sort house;
- Mineral Resources are quoted on a 100% attributable basis; and
- All figures are rounded to reflect the relative accuracy of the estimate. Where minor errors in summation occur, the CP does not consider these to be material.

For reference, the Secondary Mineralisation Resources (excluding stockpiles), broken down by domain are provided in Table 4-18**.** Note that all of the Primary Mineralisation is a single domain.

4.9 Comparison to Previous Estimates

The JORC compliant resource statement prepared earlier in 2015 was based on exploration carried out in Mugloto and Maninge Nice sectors, measuring 32 and 4 sq km of area respectively. The entire explored area was considered as one domain each in each of the sectors for resource estimation based on the geological indices recorded, and accordingly the total Mineral Resource of 27.5 Mt was considered for Life of Mine Plan (LoMp). All Mugloto and Maninge Nice group of bulk sampling pits were inside these domains providing for the resource grade for the Mineral Resource statement.

With further auger drilling carried out in adjacent Maninge Nice and Glass sectors between 2015 and 2017, the total explored area has now been extended to 77 sq km, presenting an opportunity to carry out a meaningful paleo drainage analysis of the explored area and accumulation of a host of other geological information. The geological indices superimposed on the paleo drainage pattern have facilitated in delineating eight clearly defined domains within the explored area. Out of the eight domains only four have bulk sampling pits located in them providing for the resource grade in respective domains as of resource reporting date. Accordingly, out of the total of 60.2 Mt of secondary tonnages established by exploration, only 20.6 Mt falling in these four domains was considered for life of mine planning under the SAMREC Code. The rest of the secondary material (about 40 Mt) contained in the remaining four domains is considered to be an exploration target and is expected to form part of the LoMp after adequate bulk samples are generated in each of these domains to provide acceptable grade estimates.

The CP notes that the LoMp and associated Net Present Value (NPV) have accordingly been impacted when compared to the CPR prepared in 2015. However, future bulk sampling in the remaining four domains will provide grade estimates in these areas, and potentially help in augmenting the LoMp and associated NPV.

4.10 Conclusions

The CP makes the following conclusions:

- The drilling, sampling, logging, bulk sampling and other data gathering methods used by MRM are appropriate and have yielded suitable data for use in the subsequent geological and grade modelling;
- Adequate work has been undertaken at the Project to report both an Indicated Mineral Resource and an Inferred Mineral Resource in accordance with the SAMREC Code (2016);
- The variability of grade across the deposit needs further investigation and analysis as mining progresses to improve confidence in mine planning;
- Additional work is required to improve the understanding of both the bedrock and paleo-channel geology, these aspects have a direct control on the distribution if the ruby and corundum mineralisation, and so require a more detailed level of understanding; and
- the data gathered during bulk sampling and production are considered adequate at present. Further information should, however, be collected to improve the understanding of the bed rock geology and ruby / corundum grades, to improve the confidence of future mining plans.

4.11 Recommendations

- Based on the work carried out to date, the CP recommends the following in order to provide data that will assist in improving geological understanding and confidence in any future MRE updates:

- Fully reconcile the geological model against production data from the mining activities and gemstone sales to refine the modelling approach and optimise the sample spacing for defining the gravel bed. This should also include undertaking further analysis to characterise the size and quality of stones recovered in the different production areas. This would help to improve the understanding of the source of the secondary mineralisation in particular.
- Structurally orientate any future diamond drill holes, to allow for the capture of key down hole structural data to provide a more robust basis for the interpretation of the subsurface bedrock geometry.
- Once sufficient oriented diamond drilling has been completed, commission a regional and local structural geology review of the Montepuez deposit, with particular focus on determining the structural controls on the amphibolite primary mineralisation domain.
- Use in-pit mapping, drilling, or sampling data, in conjunction with a though review of the regional and deposit scale geology of the deposit to derive an understanding of the paleochannel system. This will increase geological understanding and confidence in the secondary mineralisation, the gravel bed morphology, and the ruby grade/quality distribution.
- Complete downhole surveying of any new, inclined drill holes.
- Streamline the geological logging system for both diamond and auger drilling to ensure that the most relevant data is captured in a consistent and user-friendly format, including the recommendations given below. The CP understands that a number of these changes are already in the process of being implemented:
    - Auger drilling: expand on the current logging sheet to include the capture of data relating to the gravel bed clast size, shape, sphericity, material type etc. This may assist in determining any correlation between ruby grade/quality, gravel bed material characteristics and paleochannel location.
    - Diamond drilling: make some minor amendments to the logging system currently in place, including the capture of weathering and alteration data in two separate columns, recording of contact type information, introduction of a “lith 2” column, etc.
    - Record more detailed geotechnical information, preferably in a separate spreadsheet to the geological log.
    - Develop standardised project-specific set of logging codes and a fixed data input system that only allows the input of the agreed upon codes into the logging database.
    - Avoid systematic capture of data in the log sheet comments column.
- Ensure topographic and pit surveying is maintained in a consistent coordinate system, with errors identified by the CP being rectified as soon as possible.
- Continue to systematically record density from all new and pre-existing drill core. Ideally, a bulk density reading should be taken in every 4-5 m of competent core.
- Extend in situ and bulk density data gathering exercises to all lithologies encountered during mining and increase frequency of sample taking. This will improve confidence in the density values used for tonnage estimation, and also identify and variation in the density across the deposit.

- Complete detailed aerial photography of the prospect in order to improve on the accuracy of the artisanal working outlines.
- Systematically record information from the bulk sampling locations, including gravel bed thicknesses, morphology, basement morphology, sedimentary features or other geological information which would provide additional understanding of the depositional environment.
- Maintain auger spacing in any further areas to be delineated. The auger drilling is a quick and relatively inexpensive way of gathering data, and so should be used extensively throughout the licence area.
- The CP considers that MRM should have a sufficiently high level of understanding of the grade and quality distribution of the rubies in both the primary and secondary mineralisation to further characterise the variability across the deposit. The CP considers that this can be completed through additional bulk sampling activities in different parts of the deposit, through developing the understanding of the geology, and though the systematic recording of appropriate data. All of these aspects can be completed during the mining of the deposit, as part of the day to day production activities.

5 MINING

5.1 Introduction

This section includes all mining engineering related aspects for the Project and describes the detailed considerations and engineering methodology applied in determining a forward looking mine plan as a basis for determining the viability of an operation. The level of study is based on the ongoing Life of Mine plan.

Forecast cost estimations made use of actual production and costing data received from MRM and is associated with typical accuracy levels for an operational mine.

The previous LoM for MRM was done in 2015 and was subsequently updated in 2018 and again in to reflect the depletion of material mined in the past year.

5.2 Historical Mining Operating Statistics

Historical mine production statistics for the different operating areas is shown in Table 5 1. From Table 5-1 it can be seen that total tonnes mined, increased from 0.9Mtpa “trial mining” done in 2013 to a mine production of 4.8 Mt in 2017. The table references the Calendar Year (CY) for the particular year. CY2018 shows production data until end of August 2018. A historical overall stripping ratio of 4.63 was achieved (t:t) since inception. The table includes the detail of each of the different pit areas ore and waste mined over time. A map with an overview of the different pit areas is shown in Figure 5-1.

The historical wash grade statistics is shown in Table 5-2, summarising the overall carats achieved per annum. Despite an increase in ore mined from 2016 to 2017, a decrease in total carats is witnessed, which stems from a drive to focus efforts on areas delivering higher quality carats instead of quantity to improve early profitability of the operation.

Historical mining operating and capital expenditures are shown in Table 5-3.

Table 5-1: Historical Mining Statistics

Pit	Statistic	Metric	CY2012	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	Total
Mugloto Secondary (GB)	Waste	T		26,242	1,304,885	2,364,382	1,754,166	2,806,318	1,931,168	10,187,161
	Ore	T		21,332	295,266	360,593	353,261	568,698	397,837	1,996,987
	Total Excavation	T		47,575	1,600,151	2,724,975	2,107,427	3,375,015	2,329,005	12,184,148
	Overall SR	:		1.23	4.42	6.56	4.97	4.93	4.85	5.10
	Head Feed	T		17,804	99,053	175,038	258,486	706,779	481,578	1,738,738
	Recovery	*ct*		1,958	242,939	484,818	1,261,290	1,344,657	564,666	3,900,328
	Grade	ct/t		0.11	2.45	2.77	4.88	1.90	1.17	2.24
Maninge Nice Primary (Amphibolite)	Waste	T		0	0	0	0	0	0	0
	Ore	T	1,471	92,331	21,923	4,875	32,129	0	0	152,730
	Total Excavation	T	1,471	92,331	21,923	4,875	32,129	0	0	152,730
	Overall SR	:	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Head Feed	T	0	12,486	11,767	53,221	31,513	458	0	109,447
	Recovery	*ct*	382	1,982,583	517,308	2,117,759	6,092,135	2,717	0	10,712,884
	Grade	ct/t	0.00	158.78	43.96	39.79	193.32	5.93	0.00	97.88
Maninge Nice Secondary (GB)	Waste	T	19,207	273598	729,241	381,943	129,650	500,275	377,155	2,411,070
	Ore	T	10,042	119,182	98,681	36,395	14,061	65,933	70,422	414,718
	Total Excavation	T	29,250	392,780	827,923	418,338	143,711	566,208	447,577	2,825,788
	Overall SR	:	1.91	2.30	7.39	10.49	9.22	7.59	5.36	5.81
	Head Feed	T	113	40,581	143,538	37,778	38,198	87,757	55,766	403,732
	Recovery	*ct*	156,665	3,942,962	6,872,236	1,557,343	6,259,623	4,186,571	1,204,587	24,179,987
	Grade	ct/t	1,382.01	97.16	47.88	41.22	163.87	47.71	21.60	59.89
Glass Secondary (GB)	Waste	T	0	16,559	0	394,562	892,175	490,082	15,780	1,809,159
	Ore	T	0	15,091	0	66,841	214,652	234,171	14,062	544,817
	Total Excavation	T	0	31,650	0	461,403	1,106,828	724,253	29,842	2,353,976
	Overall SR	:	0.00	1.10	0.00	5.90	4.16	2.09	1.12	3.32
	Head Feed	T	0	1,759	0	29,564	13,755	5,278	0	50,356
	Recovery	*ct*	0	36,241	0	23,229	42,826	15,904	0	118,200
	Grade	ct/t	0.00	20.60	0.00	0.79	3.11	3.01	0.00	2.35
OMH (Other Material Handling, Roadworks, Slimes, etc)	Waste	T	0	19,982	94,390	79,318	173,783	159,546	366,795	893,813
	Ore	T		0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Excavation	T		19,982	94,390	79,318	173,783	159,546	366,795	893,813
Total (does not include roadworks and slimes handling)	**Waste**	**T**	19,207	316,399	2,034,126	3,140,887	2,775,991	3,796,675	2,324,104	14,407,390
	Ore	**T**	11,514	247,936	415,870	468,704	614,104	868,802	482,321	3,109,251
	Total Excavation	**T**	30,721	564,336	2,449,996	3,609,591	3,390,095	4,665,477	2,806,425	17,516,641
	Overall SR	**:**	1.67	1.28	4.89	6.70	4.52	4.37	4.82	4.63
	Head Feed	**T**	113	72,630	254,358	295,601	341,953	800,273	537,344	2,302,273
	Recovery	**ct**	157,047	5,963,744	7,632,484	4,183,149	13,655,874	5,549,849	1,769,253	38,911,399
	Grade	**ct/t**	1,385.38	82.11	30.01	14.15	39.93	6.93	3.29	16.90

1 – "Other" includes – Material Handled for Haul Road Maintenance.

Table 5-2: Historical Washed Grade and Quality Statistics

Pit	Quality	UOM	CY2012	CY2013	CY2014	CY2015	CY2016	CY2017	CY2018	Total
Mugloto Secondary (GB)	Head Feed	T	0	17,804	99,053	175,038	258,486	707,019	481,602	1,739,002
	Premium	ct	0	211	44,841	60,055	81,108	120,066	69,369	375,650
	Ruby	ct	0	531	99,176	228,574	278,141	426,872	173,894	1,207,189
	Low Ruby	ct	0	105	8,719	16,434	35,930	69,289	19,110	149,587
	Corundum	ct	0	76	6,000	9,449	56,581	86,622	27,738	186,465
	Sapphire	ct	0	654	60,828	123,042	196,466	123,242	46,902	551,134
	Low Sapphire	ct	0	0	0	0	507,857	326,961	227,654	1,062,472
	-4.6mm	ct	0	382	23,374	47,263	105,207	191,604	0	367,831
	Fines & Dust	ct	0	0	0	0	0	0	0	0
	Total Recovery	ct	0	1,958	242,939	484,818	1,261,290	1,344,657	564,666	3,900,328
	Grade	ct/t	0.00	0.11	2.45	2.77	4.88	1.90	1.17	2.24
Maninge Nice Primary (Amphibolite)	Head Feed	T	0	12,486	11,767	53,221	31,513	458	0	109,447
	Premium	ct	6	19	47	293	207	25	0	596
	Ruby	ct	46	49,915	43,559	51,856	202,832	26	0	348,233
	Low Ruby	ct	67	130,737	35,571	147,698	689,379	607	0	1,004,059
	Corundum	ct	263	96,120	26,971	466,246	880,089	257	0	1,469,945
	Sapphire	ct	0	1,096,316	197,994	1,413,108	2,551,809	142	0	5,259,369
	Low Sapphire	ct	0	0	0	0	489,004	537	0	489,541
	-4.6mm	ct	0	609,477	213,168	38,558	1,278,816	1,123	0	2,141,141
	Fines & Dust	ct	0	0	0	0	0	0	0	0
	Total Recovery	ct	382	1,982,583	517,308	2,117,759	6,092,135	2,717	0	10,712,884
	Grade	ct/t	0.00	158.78	43.96	39.79	193.32	5.93	0.00	97.88
Maninge Nice Secondary (GB)	Head Feed	T	113	40,581	143,538	37,778	38,198	87,757	55,766	403,732
	Premium	ct	29	242	1,868	316	717	2,080	2,126	7,378
	Ruby	ct	51,671	402,821	389,380	128,179	166,669	18,875	70,912	1,228,504
	Low Ruby	ct	33,737	620,874	753,768	174,179	383,815	228,557	193,123	2,388,053
	Corundum	ct	71,228	902,332	932,332	92,744	669,598	552,682	138,053	3,358,970
	Sapphire	ct	0	1,382,499	4,184,082	718,763	2,199,005	427,514	120,263	9,032,126
	Low Sapphire	ct	0	0	0	0	434,867	2,055,506	680,110	3,170,483
	-4.6mm	ct	0	634,195	610,808	443,162	2,404,952	901,356	0	4,994,473
	Fines & Dust	ct	0	0	0	0	0	0	0	0
	Total Recovery	ct	156,665	3,942,962	6,872,236	1,557,343	6,259,623	4,186,571	1,204,587	24,179,987
	Grade	ct/t	1,382.01	97.16	47.88	41.22	163.87	47.71	21.60	59.89
Glass Secondary (GB)	Head Feed	T	0	1,759	0	29,564	13,755	5,278	0	50,356
	Premium	ct	0	0	0	1,704	913	69	0	2,686
	Ruby	ct	0	1,568	0	5,670	6,243	104	0	13,585
	Low Ruby	ct	0	3,382	0	565	2,311	684	0	6,942
	Corundum	ct	0	5,002	0	317	3,191	2,321	0	10,831
	Sapphire	ct	0	14,501	0	11,044	16,188	905	0	42,638
	Low Sapphire	ct	0	0	0	0	11,186	10,690	0	21,876
	-4.6mm	ct	0	11,788	0	3,928	2,794	1,132	0	19,642
	Fines & Dust	ct	0	0	0	0	0	0	0	0
	Total Recovery	ct	0	36,241	0	23,229	42,826	15,904	0	118,200
	Grade	ct/t	0.00	20.60	0.00	0.79	3.11	3.01	0.00	2.35
Other	Head Feed	T	21	5	5,790	2,988	722	1,273	14,547	25,345
	Premium	ct	8	33	224	63	121	111	187	746
	Ruby	ct	36,654	108,762	1,141	1,366	654	54,424	60,479	263,481
	Low Ruby	ct	36,045	224,352	1,019	1,546	679	105,888	148,354	517,883
	Corundum	ct	29,942	240,880	1,161	1,004	1,949	78,175	101,299	454,410
	Sapphire	ct	0	5,160	6,880	12,084	3,811	156,159	145,674	329,768
	Low Sapphire	ct	0	0	0	0	41,628	114,433	87,361	243,423
	-4.6mm	ct	0	3,937	8,868	1,660	23,915	2,693	0	41,072
	Mixed Grades	ct	31,639	105,294	11,283	6,250	0	0	0	
	Fines & Dust	ct	0	2,948	0	0	0	0	0	2,948
	Total Recovery	ct	134,287	691,367	30,575	23,972	72,756	511,884	543,356	2,008,197
	Grade	ct/t	6,468.55	141,383.77	5.28	8.02	100.76	402.24	37.35	79.23
Total	Head Feed	T	134	72,635	260,148	298,589	342,675	801,786	551,915	2,327,882
	Premium	ct	43	504	46,980	62,432	83,065	122,351	71,683	387,057
	Ruby	ct	88,371	563,597	533,256	415,645	654,539	500,301	305,285	3,060,993
	Low Ruby	ct	69,849	979,450	799,077	340,422	1,112,113	405,026	360,587	4,066,523
	Corundum	ct	101,434	1,244,409	966,464	569,760	1,611,409	720,058	267,090	5,480,622
	Sapphire	ct	0	2,499,130	4,449,784	2,278,042	4,967,280	707,962	312,839	15,215,035
	Low Sapphire	ct	0	0	0	0	1,484,541	2,508,128	995,125	4,987,794
	-4.6mm	ct	0	1,259,779	856,217	534,571	3,815,684	1,097,909	0	7,564,159
	Mixed Grades	ct	31,639	105,294	11,283	6,250	0	0	0	154,466
	Fines & Dust	ct	0	2,948	0	0	0	0	0	2,948
	Total Recovery	ct	291,334	6,655,110	7,663,059	4,207,121	13,728,631	6,061,733	2,312,609	40,919,597
	Grade	ct/t	2,172.19	91.62	29.46	14.09	40.06	7.56	4.19	17.58

Table 5-3: MRM: Historical Operating and Capital Expenditures

Lithology	Units	FY2013	FY2014	FY2015	FY2016	FY2017	July'17-Dec'17	CY2018 Jan'18-Aug'18	Total
Waste	t	63,027	1,192,024	2,530,463	3,018,291	3,655,427	1,977,691	1,977,691	12,436,923
Ore	t	26,654	408,620	438,927	510,429	743,150	499,099	499,099	2,626,879
Total Excavation	t	89,680	1,600,643	2,969,389	3,528,719	4,398,577	2,476,790	2,476,790	15,063,798
Head Feed	t	13,226	158,211	325,422	295,153	553,916	443,205.00	551,915	1,789,133.
Total Recovery	ct	1,858,944	6,476,592	8,373,321	10,269,649	8,785,482	2,354,884	2,312,609	38,118,872
Operating Expenses	($Million)	-5.9	-10.9	-12.3	-39.9	-42	**-25**	-32.4	-85.62
Capital	($Million)	-8.3	-5.9	-7.5					

5.3 Mine Design and Method

The Montepuez mining operation broadly refers to 3 x main operating mining areas (Blocks):

1. Maninge Nice
2. Mugloto
3. Glass

The Maninge Nice Blocks (Main and East) areas contain Primary (Amphibolites) and Secondary (gravel bed) mineralisation whereas the Mugloto and Glass areas contain only Secondary mineralisation (gravel bed). Mining production of the Glass area commenced in 2017, with some bulk sampling having taken place prior to 2017. For the financial year - FY2017, MRM achieved a mining production capacity of 4.4 Mt - total rock, with 743 kt ore mined from primary and secondary mineralised zones. The achieved stripping ratio was 4.92. The site layout of the main operating areas is shown in Figure 5-1.

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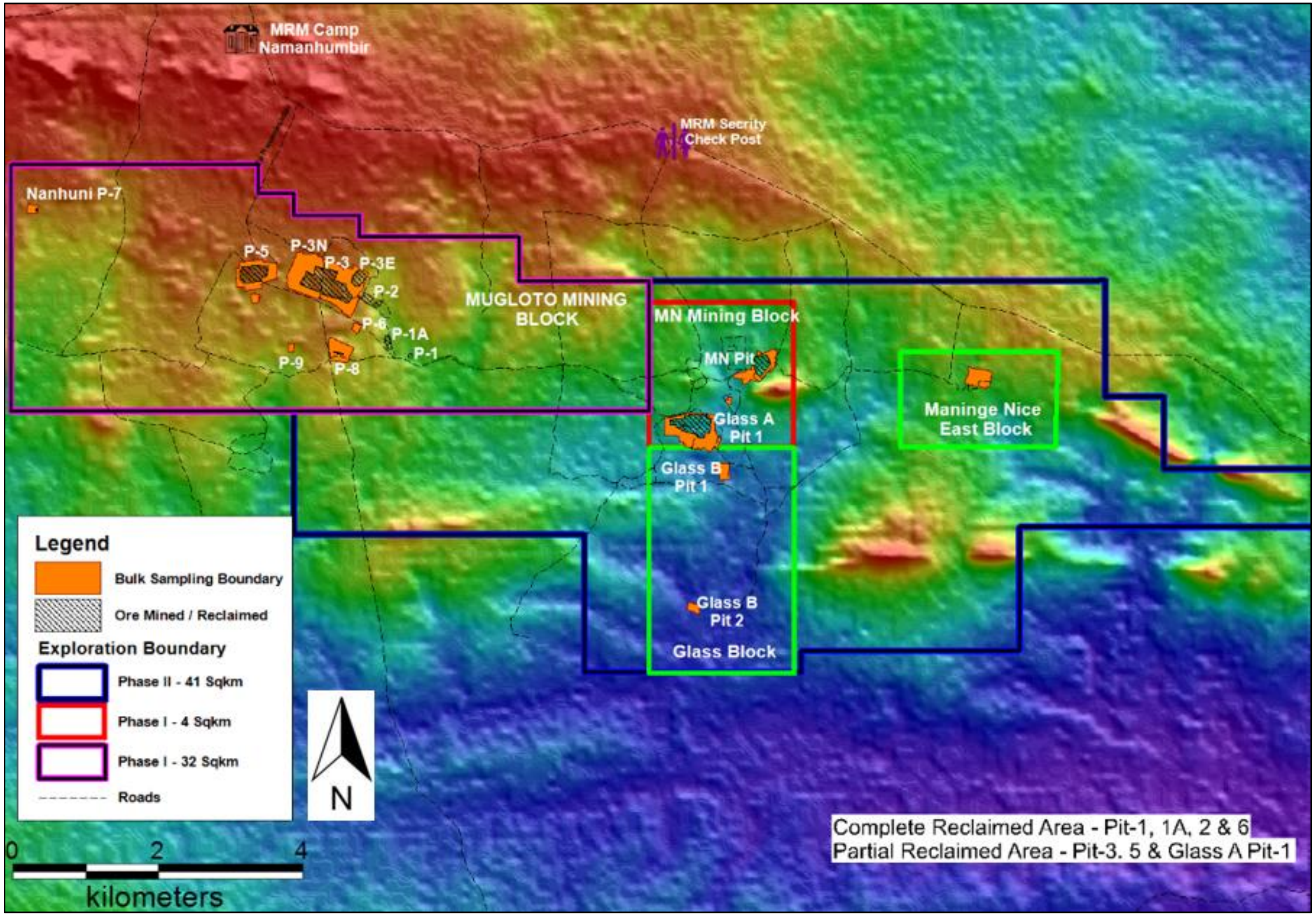

Figure 5-1: MRM Mining Areas

The mining method comprises conventional open-pit operations: excavate, load and haul to in-pit backfill, waste rock stockpile locations and stockpiles at the wash plant facility. Mining takes place in 2 x 8 hour shifts and all equipment is owned by the mine (owner operated).

'Free dig' techniques are employed for the majority of the Mine. 'Free dig' techniques are possible in the amphibolite (primary mineralisation) where weathering is present. Based on the logging of the primary mineralisation, the weathered zones were found to extend to a depth of 40 m. This assumes that no drilling and blasting will be required for the primary mineralisation.

The Maninge Nice and Mugloto mining areas are segregated into sub-areas based on the secondary mineralisation extents derived from the auger drilling and exploration trial pitting.

Mining in Mugloto and Maninge Nice varies in depth between 5 m and 8 m. Waste mining is undertaken in 2.5 m flitches. The flitch heights are reduced as the excavation approaches the gravel bed horizon as directed by site geologists. Small equipment sizes allow for highly selective mining, as shown in Figure 5-2.

Figure 5-2: Selective Mining at MRM under Geology supervision

Flitch heights vary between approximately 1.0 m to 2.5 m based on the geometry and thickness of the gravel bed.

Boundary polygons have been used to constrain the extent of the mining based on geological interpretation of the gravel bed and primary mineralisation extents. The CP notes this method is appropriate to delineate the estimated volumes of ore and waste in the gravel bed mining areas as the pits are shallow, negating any impacts which are typically associated with design considerations such as slope angles and ramp access.

Waste stripping volumes for the primary mineralisation at Maninge Nice are based on a preliminary pit shell, however, it is noted that the dip of the mineralisation is shallow enough to allow access into the pit along the footwall. The ultimate pit for the primary ore in Maninge Nice is at a depth of approximately 40 m.

5.3.1 Dilution calculation

A 3D "dilution skin" was constructed with geological software around the area modelled as mineralised gravel bed or secondary mineralisation. The methodology assumes that due to equipment size and potential variation in the geology, additional waste material will be mined along with the Gravel Bed ("GB"). The dilution skin was constructed according to the following rules.

For areas of GB <0.9 m thick:

- the GB skin was manipulated to ensure a 1.5 m thickness;

- to achieve this, the total thickness of the gravel bed at any point was subtracted from 1.5 and half of this value added to the elevation of the hangingwall and subtracted from the elevation of the footwall, respectively;
- if the GB skin hanging wall extended above the topography, then the elevation at this point was re-set to the elevation of the topography and the difference subtracted from the foot wall level to maintain the 1.5 m thickness.

For areas of Gravel Bed >0.9 m thick:

- 0.3 m was added to the GB hanging wall and subtracted from the GB footwall to produce the GB skin;
- if the GB skin extended above the topography, then the elevation at this point was re-set to the elevation of the topography and the following rules applied to the footwall:
  - if the new total thickness (z of topography – z of GB skin footwall) is >1.5m then no change was made to the elevation of the GB skin footwall; or
  - if the new total thickness (z of topography – z of GB skin footwall) is <1.5 m then the elevation of the FWL was changed to the elevation of the topography minus 1.5 m, in order to maintain the 1.5 m thickness of the GB skin.

Owing to the application of historical factors to derive RoM grades, no additional dilution or other grade adjustments factors are deemed necessary for the primary mineralisation.

5.3.2 Grade Control and Reconciliation

Grade control is practically constrained to visual inspection and mining of the mineralised zones is only undertaken during daylight hours. Geologists on site direct the mechanical loader from within the pit area to ensure that the gravel bed is mined correctly. Historical and current practice in respect of reconciliation is to record production mined, washed and recovered basis on a pit by pit basis. All material mined from a pit area is also stockpiled according to the particular area (refer to Table 5-4). All ore material is re-handled when fed into the processing plant.

5.3.3 Waste Rock Dumps

In the secondary mineralisation mining areas, waste stockpiles are used when opening a new pit. The waste is ultimately used to backfill mined out areas.

Backfilling of the Maninge Nice pits is only possible in areas which do not overlie the primary mineralisation and consequently external waste rock dumps will be required. No formal waste dump strategy or design has been developed in this area as mining is focussed on secondary material, which allows for in pit backfilling, as shown in the Mugloto Pit 3E in Figure 5-3.

Figure 5-3: Selective Mining at MRM under MRM Geology supervision

5.3.4 Stockpiles

A stockpiling strategy has been included in the MRM's plan to manage the expected variability in the gemstone grading distribution and the impacts of the wet season on productivity. The stockpiling strategy provides more than six months of production stockpiled near the wash plant facility. The total stocks on 31 August 2018 according to its origin are shown in Table 5-4.

Table 5-4: Stockpile totals on 31 August 2018

Area	Mineralisation Type	Classification	Density (g/cm3)	Tonnage (kt)	Grade Premium Ruby (ct/t)	Grade Ruby (ct/t)	Grade LR+CO+SP+4.6 (ct/t)	Contained Carats (ct ,000)
Maninge Nice	Stockpiles - Primary	Indicated Mineral Resources	1.4	47	0.003	3.660	94.200	4,599,561
	Stockpile - Secondary	Indicated Mineral Resources	1.43	56	0.016	3.465	65.278	3,850,486
Mugloto	Stockpile - Secondary	Indicated Mineral Resources	1.4	437	0.323	1.102	2.200	1,583,941
Glass	Stockpile - Secondary	Indicated Mineral Resources	1.4	442	0.068	0.373	2.712	1,393,737
Total	Stockpiles	Indicated	1	982	0.176	1.031	10.431	1,771,915

5.4 Economic Potential

Previously, a margin ranking assessment was undertaken across the Mugloto and Maninge Nice areas to prove economic viability (2015 LoMp). In principle, a margin block ranking analysis separates the operation into logically mineable blocks or polygons, each block is assigned with costs, revenues and associated margins. Varying "cut-off" grades are then applied to the blocks to test the viability of the blocks by calculating the associated block margins. The blocks that retain higher margins across a variety of cut-off grades can then be prioritised for scheduling, thereby potentially increasing NPV.

Due to grade interpolation being reliant on historical mining grades, the resultant margin ranking exercise provided limited results due to limited variability in planned grades. The previous margin ranking assessment found that margins are largely influenced by the stripping ratio, mineralisation thicknesses and mineralisation type. With the inclusion of additional mineralised material in the 2018 LoMp, considerations for stripping ratio, thicknesses and mineralisation type were the main drivers for the LoMp and economic potential. Ultimately economic potential was tested in the financial model by taking cognisance of the following economic factors:

- long term commodity prices and macro-economics;
- revenue based deductions include royalties, production taxes and auction fees;
- operating expenditures; and
- modifying factors.

Long Term Commodity Prices and Macro-Economics: The CP notes that the Company's current reporting of sales revenue is derived from the auction results. The auction results are classified into MRM gemstone grading categories which comprise Premium Ruby, Ruby, -4.6 mm, Low Ruby, Corundum and Sapphire in order of decreasing value.

Analysis of commodity prices are normally based on historical price-demand-supply assessment to establish a price relationship which in conjunction with forecast demand-supply analysis is then used to generate a price profile. The short and longer term component of this profile is then benchmarked against the consensus market forecast. In the case of gemstones, and specifically the ruby sector, historical rough prices are difficult to source. Accordingly, the CP has largely relied on the historical auction prices and benchmarked this against the current long-term price forecast as suggested by Gemfields.

Revenue Deductions: Determination of recoverable revenue typically would require a consideration for mineral processing recovery, royalties and selling charges. In this respect the CP notes that no deduction is made for typical "processing recovery" (grades estimates are based on historical production), royalties (according to the Mozambique regulations) and a direct selling charge for auction expenses are levied in relation to commodity price.

Operating Expenditures: The CP has considered the operating expenditure forecasts as assumed by MRM in its LoMp forecasts.

Modifying Factors: A dilution skin has been designed around the gravel bed mineralisation to determine the diluted modelled tonnage and grade from an in situ to a RoM basis.

5.5 Production Scheduling

The current LoMp as outlined by MRM requires a ramp up from the 2018 annualised total rock mining of 4.4 Mtpa total to 6.5 Mtpa by 2019, with ore mining from 749 ktpa to 1.5 Mtpa by 2019. The production schedule commences on 1 September 2019 and is depleted with survey results from end of August 2018. The current LoMp production is projected to extend until 2033, resulting in a life of mine of 16 years. The LoMp was optimised to mine "indicated" ore only. The physicals for each of the mining areas are summarised in Table 5-5. The production plan with a 1 September 2018 start date is shown in Table 5-6 and is based on a Mineral Resource estimate adjusted to exclude historical mining and trial mining and to include results from exploration done since 2015. The LoMp production profile is shown in Figure 5-4.

The mining sequence targets areas with lower stripping and high historical ruby recoveries at the start of the schedule in an effort to improve project value. The wash plant feed includes material that was in the stockpiles at the start of the LoMp. The LoMp targeted a stockpile total of 6 months.

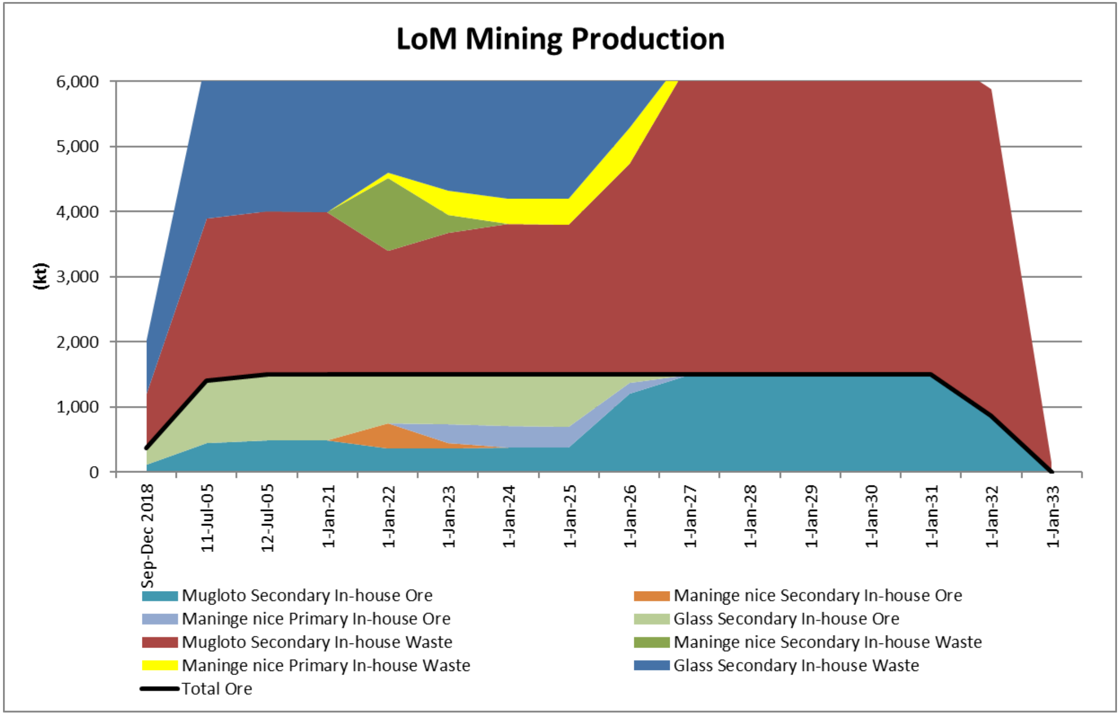

Figure 5-4: LoM Production profile

Table 5-5: MRM: Life of Mine Physicals by Mining Area

MRM Total LoMp from FY2018 to FY 2054			
MRM total production	Ore	*kt*	20,647
	Waste	*kt*	71,767
	Total	*kt*	92,415
Maninge nice primary ore production (MN)	Total Ore	*kt*	1,084
	Total Waste	*kt*	1,972
	Total rock Handling	*kt*	3,056
	Average Strip ratio	*(t:t)*	1.82
Mugloto secondary ore production (GB1)	Total Ore	*kt*	12,622
	Total Waste	*kt*	50,183
	Total Rock Handling	*kt*	62,805
	Average Strip ratio	*(t:t)*	3.98
Glass Secondary ore production (GB2)	Total Ore	*kt*	6,472
	Total Waste	*kt*	18,217
	Total rock Handling	*kt*	24,689
	Average Strip ratio	*(t:t)*	2.81
Maninge nice secondary ore production (GB3)	Total Ore	*kt*	470
	Total Waste	*kt*	1,395
	Total Rock Handling	*kt*	1,865
	Average Strip ratio	*(t:t)*	2.97
Processing summary	Wash plant head feed	*kt*	21,629
	Carats produced	*kct*	197,015
	Maninge nice - Secondary	*kt*	526
	Mugloto - Secondary	*kt*	13,059
	Maninge nice - Primary	*kt*	1,131
	Glass - Secondary	*kt*	6,914
Production split	Premium	*kct*	3,908
	Ruby	*kct*	19,691
	Low Ruby	*kct*	12,752
	Corundum	*kct*	13,331
	Sapphire	*kct*	97,358
	-4.6	*kct*	49,974
	Total	***kct***	197,015

Table 5-6: MRM Life of Mine Plan: 2018 to 2033

MRM Year-wise Summary			FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033	Total
In-house rock handling	Ore	*kt*	366	1,400	1,504	1,500	1,500	1,500	1,504	1,500	1,500	1,500	1,504	1,500	1,500	1,500	872	0	20,647
	Waste	*kt*	1,669	4,993	5,007	4,993	4,993	4,993	5,007	4,993	4,993	4,993	5,007	4,993	4,993	4,993	5,007	139	71,767
	Total	*kt*	2,035	6,393	6,511	6,493	6,493	6,493	6,511	6,493	6,493	6,493	6,511	6,493	6,493	6,493	5,879	139	92,415
	Average Strip ratio		4.6	3.6	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	5.7	0.0	3.5
Processing summary	Wash plant head feed	*kt*	366	1,400	1,504	1,500	1,500	1,500	1,504	1,500	1,500	1,500	1,504	1,500	1,500	1,500	1,504	350	21,629
	Carats produced	*kct*	9,194	2,831	2,912	4,541	24,969	34,865	34,399	34,955	19,953	4,671	4,585	5,043	4,937	4,353	3,901	907	197,015
	Weighted average grade	*ct/t*	25.1	2.0	1.9	3.0	16.6	23.2	22.9	23.3	13.3	3.1	3.0	3.4	3.3	2.9	2.6	2.6	9.1
Mugloto secondary ore production	Total Ore	*kt*	119	454	488	486	360	369	384	383	1,205	1,500	1,504	1,500	1,500	1,500	872	0	12,622
	Total Waste	*kt*	834	2,497	2,503	2,497	1,899	2,174	2,306	2,300	3,234	4,806	5,007	4,993	4,993	4,993	5,007	139	50,183
	Total Rock Handling	*kt*	953	2,951	2,991	2,983	2,259	2,543	2,690	2,683	4,439	6,306	6,511	6,493	6,493	6,493	5,879	139	62,805
Mugloto Processing summary	Wash Plant Head Feed	*kt*	132	700	666	486	360	369	384	383	669	1,053	1,504	1,500	1,500	1,500	1,504	350	13,059
	Average grade	*ct/t*	3.31	2.45	2.14	4.02	3.19	3.51	2.89	3.45	3.26	3.16	3.05	3.36	3.29	2.90	2.59	2.59	3.04
	Carats Produced	*kct*	435	1,716	1,423	1,957	1,145	1,295	1,110	1,322	2,180	3,327	4,585	5,043	4,937	4,353	3,901	907	39,635
Maninge nice secondary ore production	Total Ore	*kt*	0	0	0	0	391	79	0	0	0	0	0	0	0	0	0	0	470
	Total Waste	*kt*	0	0	0	0	1,122	273	0	0	0	0	0	0	0	0	0	0	1,395
	Total Rock Handling	*kt*	0	0	0	0	1,513	352	0	0	0	0	0	0	0	0	0	0	1,865
Maningi Nice Secondry Processing summary	Wash Plant Head Feed	*kt*	56	0	0	0	391	79	0	0	0	0	0	0	0	0	0	0	526
	Average grade	*ct/t*	69	0	0	0	56	50	0	0	0	0	0	0	0	0	0	0	56.57
	Carats Produced	*kct*	3,862	0	0	0	21,928	3,954	0	0	0	0	0	0	0	0	0	0	29,744
Maninge nice primary ore production	Total Ore	*kt*	0	0	0	0	0	284	320	319	161	0	0	0	0	0	0	0	1,084
	Total Waste	*kt*	0	0	0	0	73	372	394	393	553	187	0	0	0	0	0	0	1,972
	Total rock Handling	*kt*	0	0	0	0	73	656	714	712	714	187	0	0	0	0	0	0	3,056
Maningi Nice Primary Processing summary	Wash plant head feed	*kt*	47	0	0	0	0	284	320	319	161	0	0	0	0	0	0	0	1,131
	Average grade	*ct/t*	98	0	0	0	0	98	98	98	98	0	0	0	0	0	0	0	97.88
	Carats produced	*kct*	4,602	0	0	0	0	27,794	31,320	31,234	15,759	0	0	0	0	0	0	0	110,709
Glass Secondary ore production	Total Ore	*kt*	247	946	1,016	1,013	749	768	800	798	134	0	0	0	0	0	0	0	6,472
	Total Waste	*kt*	834	2,497	2,503	2,497	1,899	2,174	2,306	2,300	1,206	0	0	0	0	0	0	0	18,217
	Total rock Handling	*kt*	1,082	3,442	3,520	3,510	2,648	2,942	3,106	3,098	1,340	0	0	0	0	0	0	0	24,689
Glass Secondary Processing summary	Wash plant head feed	*kt*	132	700	838	1,013	749	768	800	798	669	447	0	0	0	0	0	0	6,914
	Average grade	*ct/t*	2.2	1.6	1.8	2.6	2.5	2.4	2.5	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	2.45
	Carats produced	*kct*	295	1,115	1,489	2,584	1,895	1,822	1,969	2,398	2,014	1,344	0	0	0	0	0	0	16,927
Ore Stock reconciliation	Opening balance	*kt*	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	350	
	Mine production	*kt*	366	1,400	1,504	1,500	1,500	1,500	1,504	1,500	1,500	1,500	1,504	1,500	1,500	1,500	872	0	
	Wash plant processing	*kt*	-366	-1,400	-1,504	-1,500	-1,500	-1,500	-1,504	-1,500	-1,500	-1,500	-1,504	-1,500	-1,500	-1,500	-1,504	-350	
	Closing balance	*kt*	982	982	982	982	982	982	982	982	982	982	982	982	982	982	350	0	

5.6 Equipment Selection

MRM has established the LoM equipment selection and associated equipping schedule (Table 5-7) based on the assumed operating conditions and production schedules as developed for the MRM LoMp. The mining operation accounts for all mobile equipment necessary to facilitate load and haul and all ancillary equipment required to maintain the mining operations, haul roads and waste rock dumps.

All material movement is undertaken by an MRM owner operated fleet.

The primary excavators selected are CAT336D hydraulic excavators with CAT 730C ADT's for waste mining and TATA 2523 tipper trucks for ore mining. These units are also supported by CAT 950H wheel loaders, CAT D7R and D9R track dozers and CAT 140H graders. Equipment replacement cycles have been estimated at 18,000 engine hours for all the primary equipment excluding the TATA 2523 trucks which are estimated at 10,000 engine hours. The CP notes that the equipment fleet sizes and type are compatible with the estimated production schedule tonnage and haulage distances.

Table 5-7: Equipment Fleet Size

		2016-17	2017-18	2019-33
		(#)	(#)	(#)
Excavator	*CAT 330D*	3	0	
Excavator	*CAT 336D*	6	1	15
ADT	*CAT 725*	9	0	
ADT	*CAT 730C*	16	21	38
Tipper	*TATA 2523*	26	34	50
Wheel loader	*CAT 950H*	5	6	9
TLB	*CAT 428E*	2	2	2
Dozer	*CAT D7R*	1	1	1
Dozer	*CAT D9R*	2	2	2
Grader	*CAT 140H*	1	1	1
Diesel Browser		2	0	2
Water Browser		4	3	4
Staff Bus		5	2	2
Tractor		2	1	1
LMV		53	10	10
Drilling Machine		3	0	1
Total		140	117	138

5.7 Mineral Reserves

5.7.1 Introduction

The CP has estimated Mineral Reserves in accordance with the SAMREC Code (2016). The level of study is based on the ongoing Life of Mine plan. Details are provided in the following subsections.

5.7.2 Modifying Factors

The Modifying Factors applicable to the derivation of reserves comprise estimates for the selective mining unit. The Modifying Factors considered by the CP to be appropriate for the secondary mineralisation is based on the greater of:

1. 0.3 m dilution skin to both the roof and floor contacts; or

2. a minimum total thickness of 1.5 m. The diluting grade density has been assumed at 2.01 t/m^3. Owing to the application of historical factors to derive RoM grades, no additional dilution or other grade adjustments factors are deemed necessary for the primary mineralisation.

Grade capping has been applied to the Mugloto secondary mineralisation to limit the grade of the higher value gemstones based on historically mined averages. Where historically achieved percentage, split showed an average split above 8% of premium ruby, this was capped at 8%. Since revenue was found to be very sensitive to the premium ruby grades and quality split, this capping was employed historically to ensure that revenue is not overstated.

Due to the nature in which dilution was modelled, namely that a dilution skin was applied around the modelled resource, no mining losses was applied for the secondary material. Due to the scheduling software conversion to consolidated 50m blocks, a small but negligible gain was realised for the secondary material. A small mining loss was implied in the modelling of the primary material, which was not subjected to a dilution skin methodology. The implied losses are shown for transparency, but the CP considers it immaterial.

Table 5-8: MRM: Resource to Reserve variance

Mineralisation Tyoe	Classification	Total Resource Model Tonnes (kt)	Total Reserve Tonnes (kt)	Losses Implied (%)
Primary	Indicated	1,147	1,131	-1.39%
Secondary	Indicated	20,435	20,498	0.31%

5.7.3 Ruby Prices

Table 5-9 summarises the average prices per carat applied in the financial model. In respect of the commodity price, the CP has not undertaken a detailed price analysis, but has reviewed the average prices received from all auctions to date and in discussion with the Company has adopted conservative prices that are lower than actual prices received in auctions to date. Further justification to these prices is provided in Section 10.

Table 5-9: Commodity Prices Applied

Total Sales	(USD/ct)	17.23
Premium	(USD/ct)	800.00
Ruby	(USD/ct)	25.00
Low Ruby	(USD/ct)	1.00
-4.6 mm	(USD/ct)	2.00
Corundum	(USD/ct)	0.10
Sapphire	(USD/ct)	0.03

5.7.4 Mineral Reserve Statement

The CP can confirm that the Mineral Reserve statements presented in Table 5-10 have been derived from the Mineral Resource model updated by SRK. The CP confirms that no Inferred Mineral Resources have been converted to Mineral Reserves and notes that the Mineral Resource statements reported above are inclusive of the Mineral Resources used to generate the Mineral Reserves.

The CP has estimated Mineral Reserves in accordance with the SAMREC Code (2016). As at 31 August 2018, the CP notes that the Montepuez ruby deposit has Mineral Reserves, as presented in accordance with the SAMREC Code (2016), of 1,131 kt of primary material grading at 97.88 ct/t ruby and 20,498 kt of secondary material grading at 4.21 ct/t ruby. Economic potential associated with the Reserve statement is discussed in Section 5.4 and the economic viability analysis is discussed in Section 12.

Table 5-10: MRM Mineral Reserve Statement, as at 31 August 2018, for the Montepuez Ruby Deposit

Classification	Mineralisation Type	Tonnage (kt_{dry})	Premium Ruby (ct/t)	Ruby (ct/t)	LR+CO+SP+4.6 (ct/t)	Grade (ct/t)	Contained Carats (ct, 000)
Probable							
Maninge Nice	Primary	1,131	0.003	3.66	94.22	97.88	110,709
	Secondary	526	0.013	2.85	53.71	56.57	29,744
Mugloto	Primary						
	Secondary	13,059	0.270	0.92	1.84	3.04	39,635
Glass	Primary						
	Secondary	6,914	0.053	0.29	2.10	2.45	16,927
Total Probable		21,629	0.18	0.91	8.02	9.11	197,015

Note:

1 The average value of the ruby and corundum, as reported in the Mineral Reserve Statement is USD17.23 /ct

2 Mineral Resource grades are quoted with a bottom cut-off stone size of 1.6mm

3 No Proved Reserves have been declared

SRK authored the 2015 Ore Reserve Statement (prepared under the JORC standard). The Mineral Reserve reconciliation since 2015 is shown in Table 5-11. With additional geological information available, and changes in the geological modelling methodology the table shows material that was added to and removed from the reserve since 2015.

Table 5-11: MRM Mineral Reserve Reconciliation, as at 31 August 2018, for the Montepuez Ruby Deposit

Classification	Mineralisation Type	July 2015 Reserve (Probable) (kt_{dry})	Mined July 2015 to Aug 2018 (Probable) (kt_{dry})	Reserve Added/Removed July 2015 to Aug 2018 (Probable) (kt_{dry})	31 August 2018 Reserve (Probable) (kt_{dry})
Maninge Nice	Primary	2,199	153	-915	1,131
	Secondary	1,837	415	-897	526
Mugloto	Primary				
	Secondary	23,514	1,997	-8,458	13,059
Glass	Primary				
	Secondary		545	7,459	6,914
		27,550	3,109	-2,811	21,629

The Competent Person (CP) with overall responsibility for reporting of Mineral Reserves is Mr Michael Beare CEng BEng ACSM MIMMM, a Corporate Consultant (Mining Engineering) with SRK. Mr Beare has 25 years' experience in the mining industry and has been extensively involved in the reporting of Mineral Reserves on various diamond and gemstone projects during his career to date. Mr. Beare was assisted in the mining technical evaluation by Mr. Hanno Buys Pr.Eng MEng MSAIMM, a Senior Consultant (Mining Engineering).

5.8 Conclusions

Based upon the work undertaken to date, the CP concludes the following:

- Overall, the Mine history has shown evidence of profitability and economic viability since inception in 2013.
- The LoMp considered for economic viability, from 2018 to 2033 mines an average of 6.5 Mtpa at a stripping ratio of 3.5. The LoM for MRM is 16 years from September 2018.
- The mine will keep at least six months of ore on a RoM stockpile to mitigate the effect of the variability of the gravel beds in terms of gemstone distribution.
- The capping applied to the grade modelling component of the Reserve estimation will require further verification on an on-going basis from the results of on-going mining.
- There may be further scope to optimise mining costs through more detailed mine planning and scheduling.
- Whereas the LoMp presents ruby production forecasts based on an Mineral Reserve, the CP recognises the nature of gemstone deposits and variability of ruby grades associated.
- The gravel mining operation at the Mine is a shallow, efficient, low-cost free dig mining operation which is not expected to present any major technical or logistical challenges in the future.

5.9 Recommendations

Based upon the work undertaken to date, the CP recommends the following:

- More accurate mine scheduling and planning is recommended to optimise costs and equipment optimisation. The physical and lateral extents of the area of mineralisation will imply a variation in tipper trucks for the transported ore to the ROM stockpiles in the future.
- It is recommended that return journeys of tipper trucks are utilised to back-haul waste from the waste stockpiles to the pits.
- The projected prices and volumes for the sale of ruby products from the Mine are verified on an ongoing basis to update the financial projections in the LoMp.
- It is recommended that Reserve estimates are calibrated on an ongoing basis by comparing the results of mined pits against the estimates of in situ tonnage from the auger drilling and pitting.

6 WASTE MANAGEMENT

6.1 Introduction

An SRK Process Engineer and Mining Engineer visited site during October 2017 and discussed the waste management strategies in place at the MRM operations. Waste is considered to include both:

- overburden waste rock from mining; and
- coarse rejects and sludge, being the fine tailings from the wash plant.

As described in the Mining Section of this report, the operation consists of conventional open pit mining (excavate, load and haul) focussed on three main operating areas: Mugloto, Maninge Nice and Glass. Stripped material intended for plant feed is currently stored in a series of stockpiles located immediately adjacent to the wash plant. Feed stockpiles are surveyed on a monthly basis for inventory purposes.

A significant volume of waste material is currently generated from mining operations. This material is dumped in a series of designated waste stockpiles close to the respective open pit locations.

6.2 Sludge Management Guidelines

MRM implements a number of surface water management sediment control features such as perimeter interception ditches and silt traps installed around any of the haul feed or waste stockpile areas. This is to control the amount of silt entering local water courses.

An internal MRM reference document entitled ‘Sludge Management Documents’ outlines the MRM sludge management strategy. This can be summarised as follows:

- ensure that sludge is stored in an environmentally safe manner;
- the designated area for storing sludge from the current wash plant is Glass A Pit 1;
- retain any information regarding the generation, storage and treatment of sludge;
- vehicles carrying sludge will be kept clean and maintained; and
- sludge storage areas will be secured to prevent over spilling.

The CP notes that these guidelines do not include specific provisions for wash plant fines and coarse rejects, but provides a general commentary on methods for ‘sludge’ management.

6.3 Current Wash Plant Waste Streams

As discussed in Section 7.3, MRM currently operates a wash plant and dense medium separation (DMS) plant at a feed rate of up to 200 tph. A process flow diagram which summarises the waste streams associated with the wash plant is included in Figure 7-1. Four waste streams are generated from the wash plant:

1) Stream 1: +25 mm coarse reject material: washed gravel/cobbles generated from the wet screening process; production rate for this stream is approximately 26 tph. The drained solids contain less than 5 % moisture by weight.

2) Stream 2: -25 mm +1.6 mm DMS rejects up to 83 tph. The drained solids contain less than 5 % moisture by weight.

3) Stream 3: -1.6 mm +75 µm: gravel, sand and silt material generated from the de-grit screen at up to 62 tph. The drained solids contain less than 5 % moisture by weight.

4) Stream 4: -75 µm (tailings): silt and clay fines, generated from the de-gritting and classification of the scrubber feed screen and the washing screen underflow streams in the wash plant. This material, silt and clay fines, is generated at a rate of up to 30 tph and is thickened using flocculant and pumped as a thick slurry to tailings paddocks where further dewatering and natural drying occurs.

The coarse +25 mm material (stream 1) is currently stockpiled for future evaluation.

The coarse DMS rejects and waste material generated from streams 2 and 3 above are collected from the respective stockpiles and loaded onto haul trucks for transport back to the waste stockpiles adjacent to each pit, to be used as backfill material when mining operations permit.

The collected silt and sand tailings fractions (stream 4) will be periodically cleaned from the ponds by excavator and trucked to open pit areas for disposal. Any tailings supernatant water is collected via channels and pumped back to the plant for reuse.

A waste management plan for this material has been developed by MRM which includes progressively backfilling open pit voids as part of the on-going mining activities.

6.4 Conclusions

Based upon the review of the information available related to waste management at the current operations and for the proposed expansion, the CP has made the following conclusions:

- During the wet season, significant volumes of surface run-off will flow into the proposed settling ponds, making regular clearance problematic. This could result in discharge of tailings slurry into the holding pond structure if not adequately managed.
- The current coarse waste management strategy assumes that the majority of waste generated will be backfilled in redundant open pit areas. The CP notes that this is not likely to be feasible due to bulking of the coarse reject material post processing and trucking to the disposal zones. Swell factors of between 30 to 40% should be considered during volumetric calculations going forward.

6.5 Recommendations

Based upon a review of the information available related to waste management at the current operations and for the proposed expansion, the CP makes the following comments and recommendations:

- The CP recommends that a stockpile management plan is put in place, so that deposition of coarse reject material generated from the wash plant is appropriately scheduled and optimised. Appropriate surface water management and sediment control features such as perimeter ditches and silt traps can be installed around waste storage areas.

- A progressive rehabilitation plan should be put in place for all the open pit areas, which takes into account extraction scheduling for each phase. Care should be taken to ensure that coarse reject material is deposited in zones which do not sterilise potential future reserves.
- Overall, an integrated coarse reject and tailings waste management strategy for the current operation should be prepared.

7 MINERAL PROCESSING

7.1 Introduction

The processing of ores from the MRM deposits is relatively straight forward and involves standard industry proven mineral processing methods and equipment to recover rubies and associated semi-precious gemstones.

Initially, a small, temporary, 83 tph, process plant was set up at the site for large scale sample treatment to assess the precious gemstone content and quality of the different deposits. This plant was also used to assess the processing characteristics of the ore in terms of clay and moisture content, the amount and size of contained gravel and gemstone and the performance of different items of equipment. The preliminary flow sheet was based on the test work performed at Mintek, South Africa.

Following initial operation of the 83 tph plant MRM contracted ADP in South Africa to design and construct a new, permanent process plant including a wash plant rated for 200 tph fresh feed and a DMS plant, rated for 83 tph. The plant design was based on test work and the operating experience from the smaller temporary plant. The new plant includes some of the larger equipment from the original plant and new equipment. The wash plant flowsheet incorporates wet scrubber screening to remove -1.6 mm solids followed by a log washer to breakdown clay balls followed by double deck, wet screening at 25 and 1.6 mm to remove further fines and a coarse +25 mm stone fraction. The drained -25 mm +1.6 mm fraction is further processed in the DMS plant. The lighter fraction from the DMS is rejects and the heavy fraction, containing the precious stones, is drained and collected in a secure vessel for daily transfer to the recovery house for further processing by hand. The -1.6 mm fraction from the scrubber screen and the -1.6 mm fraction from the wet screen prior to the DMS are pumped to the tailings circuit where grit is removed using a hydrocyclone prior to thickening to produce a tailings slurry. Flocculant is used to aid thickening.

The tailings slurry is pumped to settling paddocks in worked out pits where it consolidates and dries prior to transfer to permanent storage in old workings. The coarse grit and the DMS rejects are removed to waste. The coarse +25 mm fraction is stockpiled.

7.2 Laboratory Test work

Laboratory test work has been performed by two laboratories: Mintek, Randburg, South Africa and Council of Scientific and Industrial Research - Institute of Minerals and Materials Technology (IMMT), Odisha, India. SGS performed some settling tests on fine material and limited sorting tests were performed on both ore and concentrates by TOMRA and the suppliers of the Minex sorters.

7.2.1 Mintek Test work

Mintek performed test work for a metallurgical scoping study on the Montepuez ruby deposit. Four samples were received; a mineralized amphibolite, a coarse +1.6 mm gravel sample, together with a barren rock and a soil sample.

The test work was conducted in two phases. Phase 1 involved sample characterisation tests, scrubbing tests to evaluate breaking up the clayey material and gravity concentration tests including Heavy Liquid Separation (HLS) and Mineral Density Separation (MDS) or jigging test work on the coarser +1 mm fraction and Shaking Table test work on the finer -1 mm fraction. Mineralogical evaluation was performed using X-ray Diffraction (XRD) analyses. In Phase 2, two samples, gravel and amphibolite, were used; 2 kg samples of ruby/corundum were added to the each of the two samples and HLS test work performed.

The test work showed that the amphibolite sample contained significant amounts of clay and the intense scrubbing was required to break-up the clay bound particles. The HLS results showed that it was possible to beneficiate the corundum minerals by gravity techniques. The bulk of the material was rejected as waste; at a low-cut density of 2.8, as there were visually no corundum pieces at this cut density. The majority of the corundum reported at high specific gravity (SG) of 3.7 to 4.0. Mineralogical test work also showed the ruby/corundum is liberated at high densities and the relatively small amount lost to the waste was found to be attributed to entrainment, where corundum is present as fine liberated particles in a much coarser low SG sample, as well as some particles finely inter-grown with gangue.

The metallurgical scoping study considered three options: jigging, DMS, and a combination of primary jigging followed by DMS. The DMS option could treat the de-slimed feed material whilst jigging could be used as a pre-concentration step on the de-slimed feed prior to DMS of the jig concentrate. Efficient jigging can only be performed on closely sized fractions, which means that the feed would have to be classified and treated in a number of parallel jig circuits. In addition, the efficiency of separation of a jig may result in some lost gemstones in the rejected material.

The CP notes that jigs were used in the temporary 83 tph plant and DMS was used in the new 200 tph plant.

7.2.2 IMMT Test work

The IMMT test work was performed in 2014 on a gravel sample designated MRM-010. The sample was nominally -25 mm. The d_{80} of the sample was 13.8 mm and d_{50} was 4.0 mm. It is noted that 85% was coarser than 1 mm and the balance contained material down to sub-micron sizes. HLS, performed on 12 size fractions between 20 mm and 45 µm, at an SG of 2.89, demonstrated that the heavier particles, including the gemstones, could be easily concentrated into the sinks fraction. The overall mass yield of the sinks fraction was 2.0%. The efficiency of gemstone recovery was not determined. Gravity test work using a number of different pieces of equipment indicated that the separation could be achieved on +1 mm material using jigging. The mass yield from the jig was around 4.0%.

7.2.3 SGS Settling Tests

SGS performed laboratory setting tests on three samples from the MRM. The samples were Maninge Nice Amphibolite, Maninge Nice Gravel Bed and Mugloto Gravel Bed. The tests were performed on the -63 µm fraction. The results are presented in Table 7-1. The underflow solids were all less than 40% w/w solids and lime was required to achieve acceptable overflow clarity.

Table 7-1: Typical settling test results

	Feed solids % w/w	Flocculant dosage g/tonne	Calculated underflow density %/w/w	Lime addition for O/F clarity
Maninge Nice Amphibolite	7.5	33	30.7	Y
Maninge Nice Gravel Bed	10	50	38.0	Y
Mugloto Gravel Bed	10	40	37.3	Y

7.2.4 Sorting Tests

Limited sorting tests have been performed for both ore and concentrates. Tests have been performed at the TOMRA test facility in Wedel, Germany and in Leuven, Belgium. In addition, optical sorting has been evaluated by Binder+Co AG suppliers of the Minexx sorters. In both cases, the testing indicated that automatic sorting of the gemstones from the ore or from pre-concentrated material was feasible and warranted further evaluation. Further testwork has been performed and has been used for the design of a new sort house.

7.3 Processing Facilities

7.3.1 New 200 tph Wash Plant and DMS

The temporary 83 tph plant has been dismantled. The log washer and the wash screen from the old plant has been installed as part of the circuit in the new wash plant. The flowsheet with design mass balance is shown schematically in Figure 7-1.

The new plant incorporates a scrubber and a DMS plant. The scrubber unit has been designed to process up to 200 tph of fresh feed. The mass balance varies significantly depending on the ore source and consequently equipment has been sized taking in to account relatively large variations. The DMS module has been designed to process 83 tph of -25 mm +1.6 mm sized feed from the wash plant.

Process Description

Large run of mine stockpiles, reported to be in excess of 700 kt, are maintained ahead of the plant. The stockpiles are segregated by pit designation and in-pit location. Ore can be fed to the plant either from these stockpiles or directly from the pits. The stockpiles are controlled by geology/mining.

Plant feed is loaded in to the feed hopper by a Front End Loader (FEL). The amount of wet feed is measured by a calibrated sensor in the FEL bucket and is recorded automatically. A static grizzly removes any oversize stone or large pieces of clay and the feed is washed in to the scrubber screen feed box by a manually controlled high pressure monitor spray. The oversize from the feed grizzly is collected and periodically broken up and re-fed in to the feed hopper.

The slurried feed gravitates in to the scrubber screen and further water sprays remove nominally minus 1.6 mm material. The scrubber screen discharges on to a double deck screen, the upper deck removes the coarse stones and the lower deck the -2 mm particles in a slurry.

The wet solids from both screen decks are conveyed to the log washer feed. The -2 mm material from both the scrubber screen and the discharge screen is pumped to the tailings circuit.

The log washer is required to breakup clay balls which bind finer particles together, potentially containing gemstones. Water is added and the resulting slurry discharges on to another double deck washing screen. This screen removes +25 mm stones to a stockpile and minus 1.6 mm solids as a slurry. The -25 mm + 1.6 mm washed solids are collected and conveyed to the DMS plant feed hopper. The removal of clay is very important as it will impair the operation of the DMS plant and affect the separation efficiency. The coarse stone from the wash screen may contain some clay balls and consequently is stockpiled for further treatment at a later date. A small amount of coarse stone is added to the feed to assist in breaking up clay balls in the scrubber screen.

The drained -25 mm +1.6 mm fraction is further processed in the DMS plant. This plant utilises ferro-silicon (FeSi) for the dense media. The plant incorporates feed screening, feed/media mixing, two dense media cyclones together with the cyclone feed pumps, a dense media handling circuit incorporating magnetic separator for recovery and densification of the FeSi and a split drain and rinse screen for removal of the FeSi media and washing of both the concentrate (heavy fraction) and the reject (lighter fraction). Washing of the both products is essential to minimise the loss of the FeSi from the circuit. The plant incorporates instrumentation to control the density set points to ensure efficient separation of the concentrate, including the gemstones, from the lighter rejects. The lighter fraction from the DMS is rejects and are discarded to dump and the heavy fraction, containing the precious stones, is drained and collected in a secure vessel for daily transfer to the recovery house for further processing by hand.

The -1.6mm fraction from the scrubber screen and the -1.6mm fraction from the wet screen prior to the DMS are pumped to the tailings circuit where grit is removed using a hydrocyclone prior to thickening to produce a tailings slurry. Flocculant is used to aid thickening.

The tailings slurry is pumped to settling paddocks in worked out pits where it consolidates and dries prior to transfer to permanent storage in old workings. The coarse grit and the DMS rejects are removed to waste.

The layout of the plant is shown in the photograph in Figure 7-2. The scrubber screen, log washer and wash screen, DMS plant and the tailings degrit and thickener are labelled for clarity.

Pictures of the wash plant scrubber and the DMS plant are shown in Figure 7-3 to Figure 7-5.

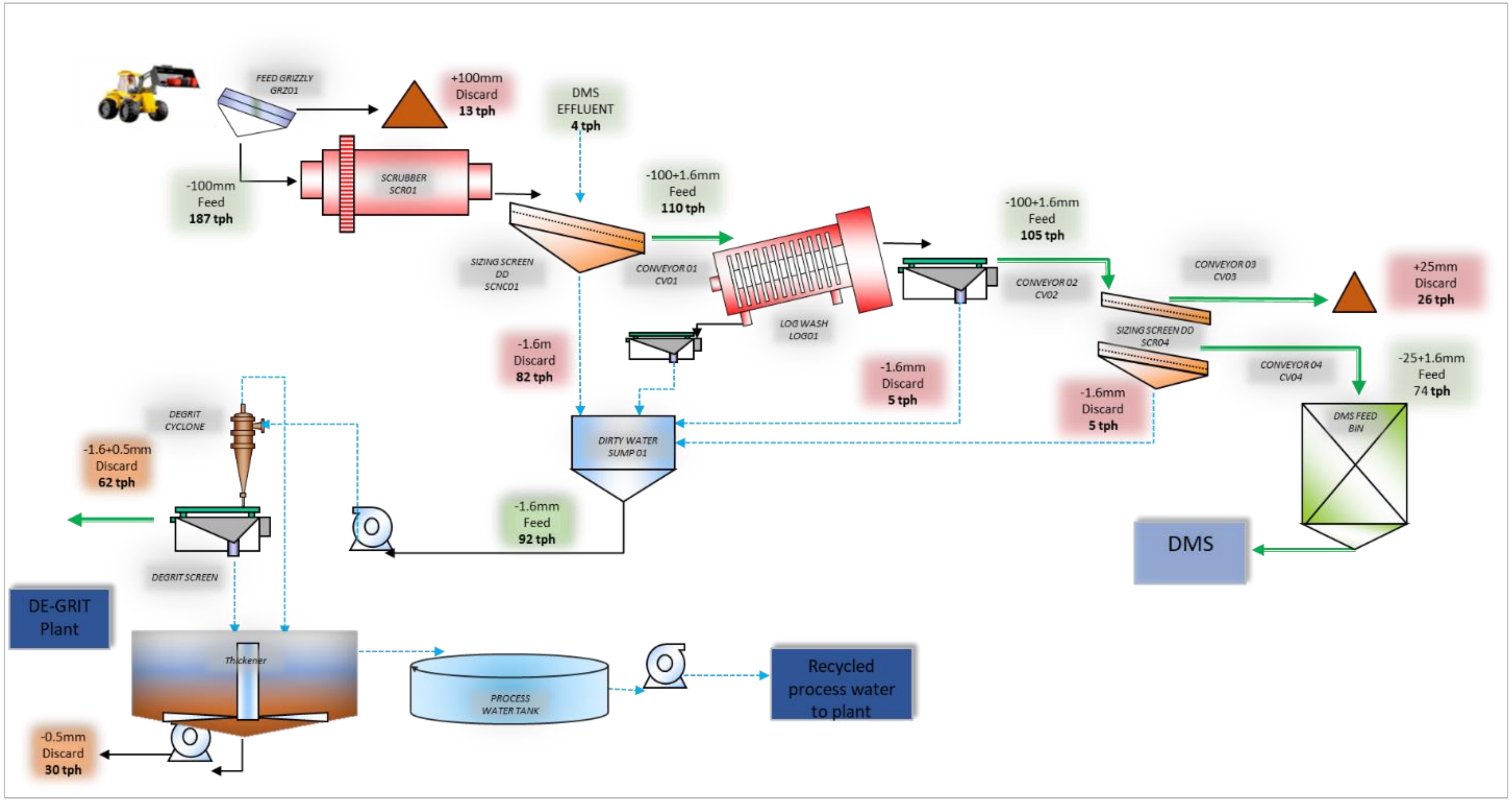

Figure 7-1: Plant flow sheet

Figure 7-2: Plant layout

Figure 7-3: Wet scrubber screen

Figure 7-4: DMS plant showing feed screen, media pumping circuits, dense media cyclones and drain and rinse screen

Figure 7-5: DMS plant and discard conveyor

7.3.2 Historical Processing Operating Statistics

Throughput

The temporary wash plant started operations in November 2012. The new plant has been operating since December 2016. The new plant is used for both bulk sampling and production.

The installed capacity of the new wash plant is 200 tph although nominal operating capacity is 150 tph. The clay content of the ore has a marked impact on the throughput that can be achieved. During the recent site visit operating staff reported that the maximum feed had been restricted to approximately 135 tph due to a capacity bottleneck in de-gritting and tailings thickening circuit and problems with the clay content of the ore. The DMS plant is designed for 83 tph but to date, due to the reduced feed rate, has been required to operate intermittently for around 46% of the available operating time to meet the production schedule.

The plant recovers gemstones using DMS technology and the mass yield of concentrate (heavies) containing the gemstones is less than 0.1%.

Density tracer tests have been conducted on the DMS plant and have indicated satisfactory separation of the heavy fraction from the lighter discard.

Potential stone breakage has been noted in a few of the final gemstones and this has been investigated on the plant. Preliminary indications are that breakage is not occurring in the plant and that the "breakage" is probably due to clipping of stones in the recovery house to remove small defects. At the time of this report these investigations were ongoing.

Limited operating data is available as the plant has only been operating since December 2016.

The plant operation is targeted to meet the scheduled gem auctions and the ore fed to the plant is adjusted in terms of ore source, which affects gemstone content and quality, and ore tonnage processed. The plant operation is not continuous and as noted above the plant utilisation is relatively low due to plant bottlenecks and issues with clay content of the ore.

In Q12017 a total of 219,220 t of ore was processed and at 100% utilisation this equates to 83 tph. Allowing for maintenance the plant feed rate is typically 130 to 150 tph.

The budget throughput for 2017 is 746 kt ore. No figures on ore source or gemstone quantity or quality has been reported.

The CP recommend that more detailed plans are produced in terms of ore sourcing, ore quantity and gemstone production.

7.3.3 Further Wash Plant Expansions

During the SRK site visit MRM advised that there were no plans to expand the recently installed wash and DMS plant.

MRM indicated that if additional resources are identified in the future in locations remote from the existing operations then additional wash and DMS plants would be considered at these new locations. There are no plans at the time of writing this report.

7.3.4 Recovery House

The existing recovery house is located in a high security compound. Access to the compound and the recovery house is restricted. All recovery is currently performed manually in the high security area under strict supervision. All operations are covered by cameras.

The existing recovery house has been modified to accept the new concentrate transfer vessel from the new plant. The concentrate is pneumatically moved from the transfer vessel in to a holding tank inside the high security area.

Additional screening capacity is being installed to allow the size classification of larger quantities of concentrate from ores that contain a higher mass of heavies.

In addition, a small belt magnet has been installed to remove any iron impurities in the recovery house feed.

MRM has sanctioned a new recovery house incorporating automatic recovery machines. This plant would be located adjacent to the wash plant to allow direct transfer of concentrate between the two operations. This project is detailed in Section 7.5.2.

7.4 Tailings Treatment and Storage

The tailings treatment circuit was included in the new wash plant design.

Nominally -1.6 mm solids removed in the scrubber screen, scrubber discharge screen and the wash screen are pumped as slurries to the tailings de-gritting section. The slurries from the different sources are combined and pumped to a hydrocyclone classifier. Coarse underflow discharges from the hydrocyclone on to a 0.5 mm screen and the +0.5 mm solids are dewatered and collected for transfer to dump via truck. The -0.5mm screen undersize discharges as a slurry back in to the cyclone feed pump hopper. The hydrocyclone overflow slurry containing -0.5 mm solids gravitates to an 18m diameter thickener. Flocculant solution is added to the thickener feed to aid solids settling and the thickener underflow is pumped to the tailings settling paddocks. Average flocculant consumption is approximately 40 g/t of wash plant feed. Overflow from the thickener discharges to the water tank for reuse in the wash plant.

The tailings settling paddocks are located in operational mining areas. Further settling of solids occurs and any excess water is collected via temporary channels and is pumped using a diesel powered mobile pump back to the thickener water tank for reuse. Once a paddock has been filled the tailings slurry is diverted to the next one. The solids in the full paddock are allowed to dry and are then excavated and trucked to a worked-out pit for final disposal. Tailings discharge, the typical paddock system and the water return trenching and pumping system are shown in Figure 7-6 to Figure 7-8 respectively.

During the SRK site visit, MRM advised that the amount of fine material separated from the DMS feed exceeded the capacity of these circuits and that this represented a bottleneck to production. Additional tailings treatment equipment has been ordered and will be installed in the coming months. This is described in 7.5.1.

In addition, MRM advised the samples of thickener underflow have been sent to Roytec in South Africa for filtration testing. MRM advised that once these results are available the feasibility of the filtration technology will be evaluated.

Figure 7-6: Thickener underflow discharge in to tailings paddock

Figure 7-7: Tailings paddocks

Figure 7-8: Tailings return water system

7.5 Projects

7.5.1 De-grit circuit and thickener

During the SRK site visit, MRM advised that the de-gritting and thickener circuits were undersized and were currently a bottleneck to production. The amount of fine material from the scrubber, discharge screen and the wash screen regularly exceed the capacity of the tailings circuit. The wash plant feed is managed to maintain acceptable operation of the de-grit/thickener circuit.

MRM advised that the de-grit circuit will be enhanced by replacement of the single 760 mm diameter hydrocyclone with two 450 mm diameter units, installation of a second de-grit screen and a new thickener. In context to that the new upgraded de-grit unit was installed and commissioned in November 2017.

With regard the new thickener the study and sample testing is currently on going and the exact cost still unknown.

The thickener underflow (tailings) settling paddocks are located in operational mining areas. Further settling of solids occurs and any excess water is collected via temporary channels and is pumped, using a diesel powered mobile pump, back to the thickener water tank for reuse. Once a paddock has been filled the tailings slurry is diverted to the next one. The solids in the full paddock are allowed to dry and are then excavated and trucked to a worked-out pit for final disposal.

In addition, the samples of thickener underflow have been sent to Roytec in South Africa for filtration testing. MRM advised that once these results are available the feasibility of the filtration technology will be evaluated.

7.5.2 Recovery House Project

Following the installation of the new wash plant MRM has decided to construct a new recovery house and recovery installation incorporating state of the art hands-off sorting equipment.

Research has demonstrated that automatic sorters utilising UV light can be used to recover rubies. Following technical and commercial evaluation of proposals Binder A.G. was selected as the preferred supplier of the automatic UV sorters and an order placed for four units.

ADP has been selected as the construction and installation contractor based on their proven track record on the wash and DMS plant and to provide seamless integration of the existing plant and the new recovery house. The new recovery house will be located adjacent to the wash plant/DMS in the same secure area. The recovery house will include strict security measures including CCTV in all areas. The complex is designed to house three separate facilities:

- Personnel Control Centre (PCC);
- Recovery; and
- Recovery House.

The project schedule is 16.5 months. The project budget is given in Table 7-2.

Table 7-2: Recovery House Capital Cost

Area	USD M
Recovery House & Recovery Facility	12.3
Binder AG UV Recovery Units	1.4
Security and Peripherals	0.7
Total Recovery House Project Cost	**14.4**

Personnel Control Centre

In this area, all access and egress is controlled by means of two areas (Red and Blue). Red being the route taken by the recovery house and recovery team and Blue by the wash-plant team. This area will also house the security control room for the facility as well as the X-ray search booths. A dining room and ablutions are also attached to this area.

The proposed location is shown in Figure 7-2.

Recovery

Concentrate from the DMS plant will be transferred to the sizing area by pipeline. The recovery area will accommodate all mechanical recovery processes. This process will take place in the following sequence:

- de-watering;
- drying;
- cooling; and
- UV sorting.

The capacity to recirculate processed material has been built in to the design and material can be recirculated until recovery shows zero. Processed material will be evacuated by means of conveyance.

The sizing section is shown in the graphic in Figure 7-9.

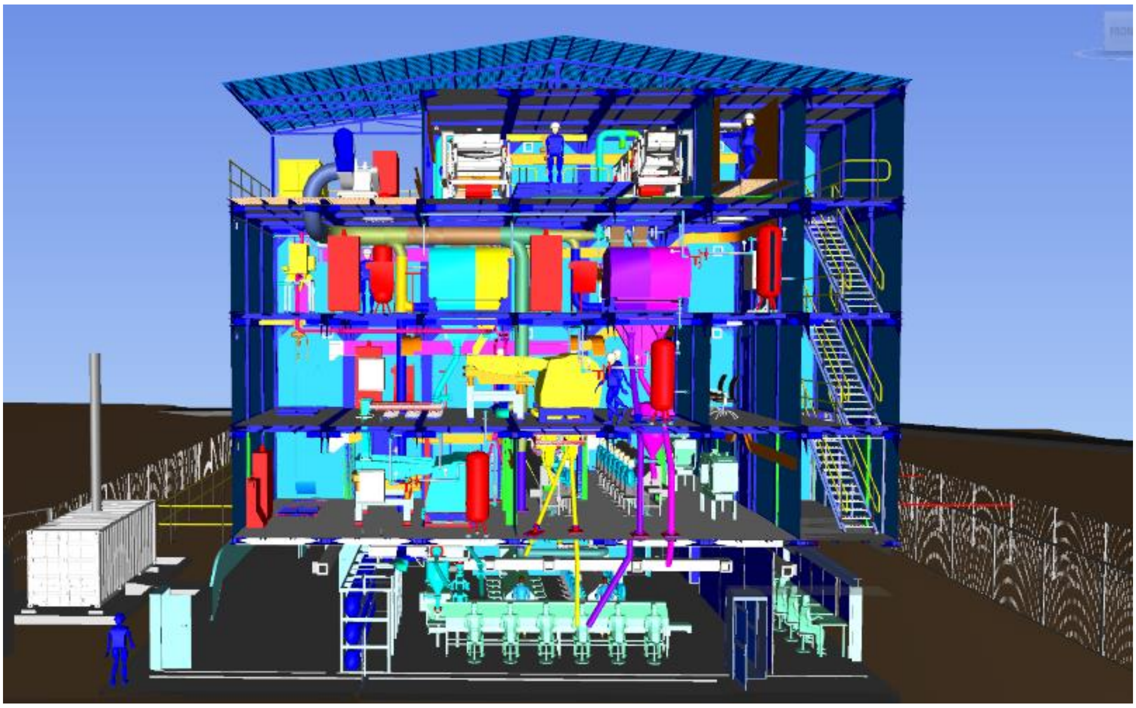

Figure 7-9: Sizing section

Recovery House

The Sort House area is where all manual sorting and classification will take place in glove boxes as well as physical material grading. This area will also house vaulting and export areas. The layout is shown in Figure 7-10.

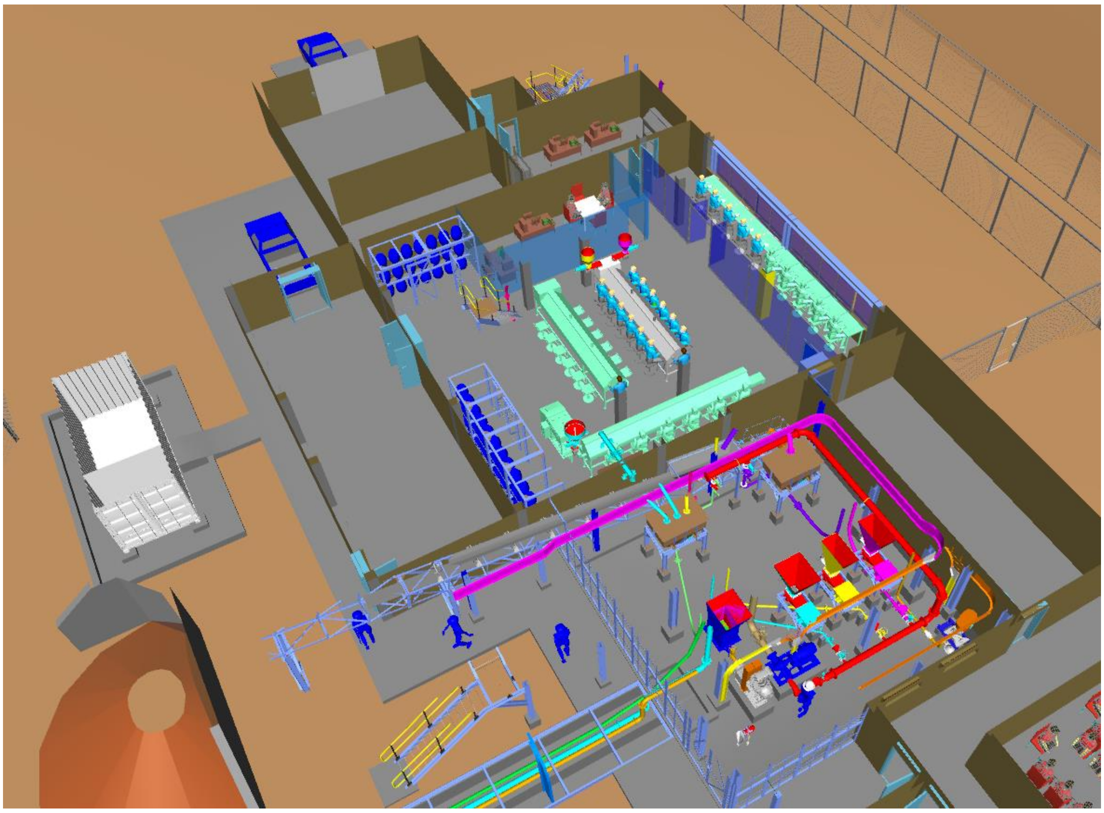

Figure 7-10: Recovery House layout

7.5.3 Tailings Filter System

MRM is investigating the feasibility of filtering the fine fraction of the tailings for disposal as a cake. The filter feed would be the underflow from the existing thickener and typically, based on industry practice, the moisture content of the cake would be 15 to 20 % by weight.

Samples of tailings have been submitted to Roytech in South African for evaluation and MRM reports that filtration test work is ongoing at the time of this report.

No other details are available for this project. Capital and operating costs will be developed as part of the feasibility study evaluation.

7.6 Process Plant Operating Expenditures

The new processing plant commenced operation in December 2016 and consequently limited information is available on the operating costs for the new wash and DMS sections. The average operating cost for the wash and DMS plant is USD2.46 /t of ore processed, inclusive of assigned camp costs (<1%0, Fuel (9%), Labour (47%). Other process costs include FeSi and flocculant (2%), maintenance costs (31%) and power (10%). Security is included elsewhere in the operating cost structure. The CP notes that the current operating cost is slightly lower than the pre-new plant costs of USD2.81 /t of ore processed.

The existing Recovery House costs are quoted as USD1.80 /t. The plant operates on a 24-hour basis and utilises a three-shift system including expat management and operations supervision together with some local operations personnel.

The plant currently employs 87 people split as follows:

- MRM Expats 14;
- MRM Locals 14; and
- Contractors 59.

The FeSi consumption is quoted as approximately 600 g/t of DMS feed. The flocculant consumption is quoted as 40 g/t of fresh plant feed.

The process plant consumes around 260,000 kWh of power per month at a cost of 3.99 Meticals/kWh equivalent to approximately USD 18,000 per month

The CP consider these costs as reasonable although a more transparent method of presenting costs should be established.

7.7 Process Plant Capital Expenditures

The capital cost for the new Recovery House is USD14.4 M as detailed in Table 7-2.

7.8 Conclusions

Based upon a review of the information for the current operations the CP has drawn the following conclusions:

- The current facility is considered fit for purpose and for both operational gem production and for ongoing bulk sample preparation.
- The de-gritting and thickening section of the wash plant is significantly undersized and is a bottleneck to production and should be expanded as soon as possible.
- Operating costs are considered acceptable.

7.9 Recommendations

Based upon a review of the information available related to processing at the current operations, the CP makes the following comments and recommendations:

- Install the additional de-gritting and thickener as soon as possible.
- Filtration testing of the fine tailings should be completed as soon as possible, and a feasibility study prepared to evaluate and cost a revised fine tailings dewatering, handling and disposal system.
- Prepare more transparent operating cost details inclusive of all cost elements for the wash and DMS plants.
- Prepare a project schedule and cost control model for the new Recovery House project.
- A detailed, seasonal water balance should be prepared for the wash plant and site as a whole.

8 INFRASTRUCTURE

8.1 Introduction

Figure 8-1 presents the existing project layout and shows the different classes of access and haul road and the primary operational support areas.

8.2 Roads

8.2.1 Existing

The Mine offices and camp are currently accessed by a 1.2 km gravel roads which passes through the village of Namanhumbir from regional Route 242. The regional Route 242 connects Pemba and Montepuez.

A 4 km gravel road connects the Mine gate with the maintenance area, recovery house and wash plant.

Gravel haul roads 16 m wide connect the wash plant with the Mugloto and Maninge-Nice mining areas (see Figure 1-2 and Figure 8-1) which are shared by both light and heavy vehicles. For security reasons, haul trucks currently travel to the wash plant in convoys.

8.3 Accommodation and Administration

The main offices, stores and accommodation are located at the Namanhumbir camp and comprises predominantly prefabricated and block work structures within a fenced compound. This facility will be expanded to support the proposed expansion project.

The CP understands the existing workforce as at June 2017 totals 1,120 employees including 440 direct MRM employees and 680 contractors currently working with MRM.

To accommodate the increase in personnel, an expansion of the existing Namanhumbir camp is currently underway. The expansion plan layout and proposed buildings were provided during the visit and, at present, the expansions phase to include functional / recreational areas and accommodation units. The building system for the new buildings is prefabricated steel and plaster. The remaining expansion plans along with the existing camp is shown in Figure 8-2.

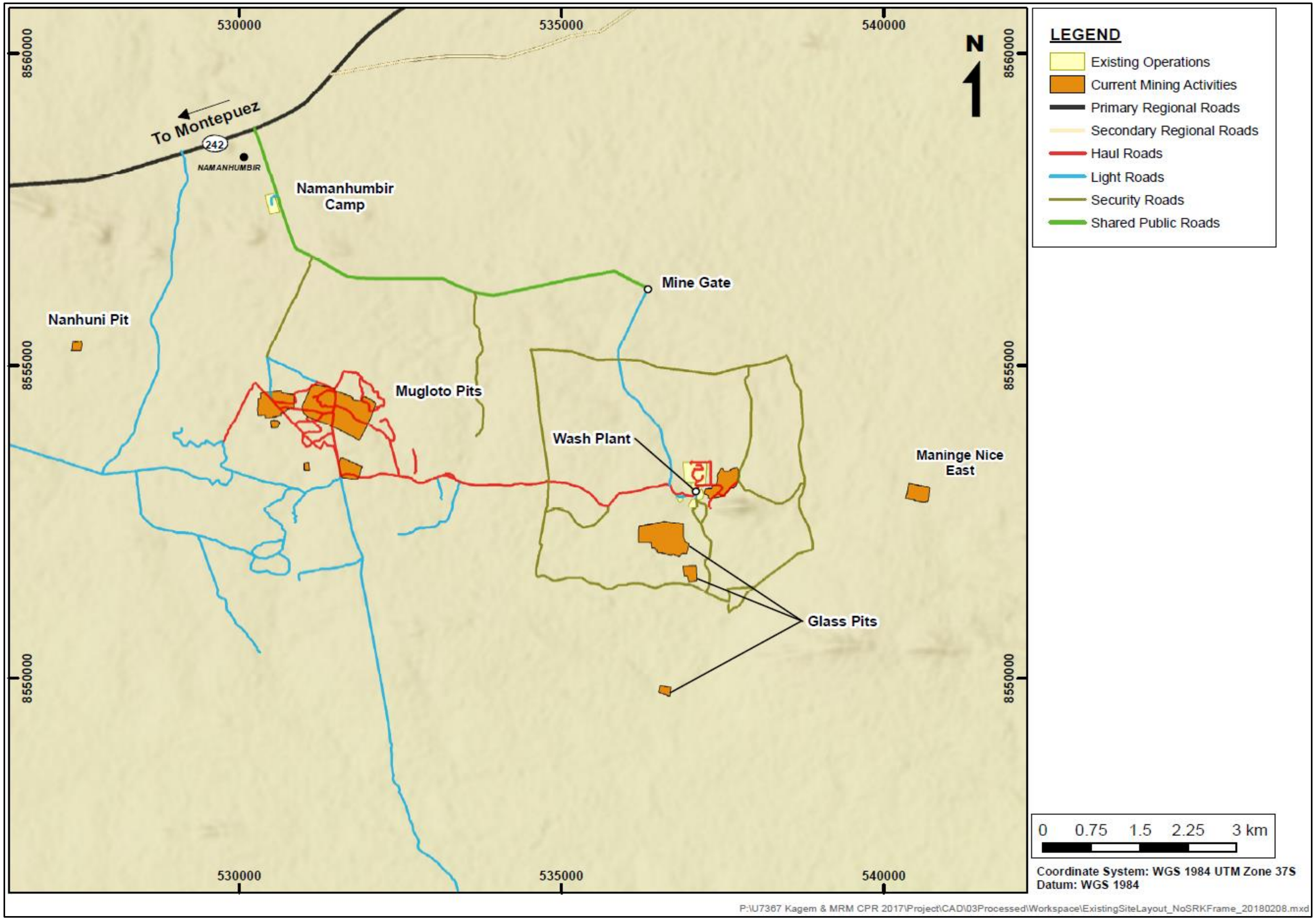

Figure 8-1: Existing Project Layout

Figure 8-2: Existing Project Layout - Namanhumbir camp expansion

8.4 Mobile Equipment Maintenance

All light and heavy mobile equipment is currently maintained in a common maintenance area comprising a double bay workshop, wash pad and lay down area. The existing workshop presented in Figure 8-3 is constructed from 40’ shipping containers which are also used for offices, stores, welfare, hose room and electrical workshops.

A 12.5 t capacity mobile crane is used to maintain the larger equipment. The maintenance area has a single access for entry and egress and the workshop orientation requires vehicles to drive in and reverse out.

MRM owns and occupies all current mining equipment for overburden, ore and backfill operations.

The storehouse within the maintenance area is replenished weekly from the MRM primary at the newly built warehouse located next to the exploration yard.

Figure 8-3: Existing Maintenance Workshop

All non-hydrocarbon industrial waste from maintenance activities is currently stored at the rear of the maintenance area, some of which is located outside the perimeter fence-line adjacent to nearby water bodies. Waste hydrocarbons are currently stored in drums in an open area to the rear of the workshops. A contractor periodically collects and transports waste hydrocarbons to Pemba for treatment and safe disposal.

The CP notes that MRM plans to construct an improved secure area where different waste streams can be separated prior to disposal. This will include a better designed bunded hydrocarbon storage area with appropriate surface water management and pollution control measures.

All light and heavy vehicles are washed prior to maintenance activities on a raised earth platform. A pollution control unit is located adjacent to the wash pad; however, this unit needs improvement and is being upgraded to reduce water ponding and the potential for hydrocarbon spillage. The CP recommends that a conventional enclosed wash pad is constructed comprising a concrete platform with appropriate water management and pollution control measures.

The CP also recommends that concrete aprons are constructed wherever maintenance activities are planned with appropriate perimeter drainage channels to collect and reticulate captured water and spillages to a pollution control unit.

8.5 Logistics and Stores

MRM imports goods, spares and consumables from a variety of suppliers to support the current operations. The mobile equipment maintenance suppliers are based in Maputo, whilst the Original Equipment Manufacturers (OEM) for the wash plant are based in South Africa. The imported goods are received at either Nacala or Maputo ports and transported to the Mine by road.

The newly built primary logistics warehouse is shown in Figure 8-4. MRM has defined all goods/spares into critical, medium and low importance categories. The primary warehouse has a 6-month inventory of critical spares and a 1-month inventory of medium/low importance spares. All perishable and non-perishable food is sourced locally and a delivered to site every 15 days.

Fuel is delivered daily by Petromoc in 10,000 litre capacity road tankers and stored in a 46,000 litre capacity bunded facility (Figure 8-5) which is owned, maintained and operated by Petromoc. Light vehicles refuel use the metered dispensing system adjacent to the fuel tanks whilst an MRM fuel bowser refuels heavy equipment within the mining and waste operating areas.

The fuel supply contract with Petromoc is based on a 5-year rolling contract (dated 2012) as long as neither party manifests intention to terminate the same 60 days before the renewal date.

The cost of fuel changes every month as per the Government of Mozambique rules. Currently fuel is bought at a delivered cost of MZN 47.08/litre (USD 0.77 /litre at a conversion of 1:61 USD:MZN). This final cost is composed of a base price ex Pemba plus the costs for transport, VAT and government tax added. Petromoc reserve the right to adjust the base fuel price should the government of Mozambique adjust the price which is set through legislation.

Currently there are three tanks provided by Petromoc to facilitate MRM needs with a total capacity of 96,000 litres, which is under negotiation to be increased to 130,000.

Figure 8-4: Newly built Spares warehouse interior

Figure 8-5: Existing Fuel Storage

8.5.1 Product Handling

Concentrate from the DMS plant is collected in a sealed vessel and transported to the existing recovery house by truck. Once the new recovery house is completed the transfer point will be adjacent to the DMS plant and will be via pipeline.

MRM has installed a helicopter pad and a helicopter is used to export gems.

8.6 Emergency Response

The first aid centre is operated by a doctor and two nurses. MRM has a contract with Montepuez hospital for the treatment of MRM personnel. The helipad will also assist with the emergency evacuation of MRM personnel.

8.7 Waste Management

There is no domestic or industrial waste disposal site at the mine and as such when this type of waste is generated the following procedure shall apply:

- When waste is generated and needs to be disposed of, the HSE Officer- Environment shall be informed of the nature of the waste as well as the quantity of the waste.
- The HSE Officer will develop recommendations for each unique case of waste disposal.
- These recommendations shall be followed by the departments responsible.
- Mine tailings shall be disposed of in the formal mine tailings landfill.

Every area that produces hazardous, medical and or non-hazardous waste must have a satellite accumulation site indicated by sign boards:

- Hydrocarbon contaminated waste: The hydrocarbon contaminated waste in the SKIP container to be disposed at the industrial landfill by means of the contractor named Moz Environment, Pemba.

- Medical & Domestic Waste: Medical & Domestic waste to be incinerated on site/ ash resulting from this to be disposed at the industrial landfill. Non-Biodegradable material / waste is segregated and disposed by means of the contractor Moz Environment.
- Mine Tailings: Debris resulting from mining operations to be disposed at the formal Mining Landfills on site. MRM is in the process of applying for the landfill operational permit.

8.8 Security

Due to the nature of the business, the security situation in the MRM concession, and the areas around the concession, can change quickly. To this effect, the MRM Board of Directors has recently approved a security plan, but continuously evaluates the situation and looks to amend and update the security plan as the project develops and increases its footprint.

The main security challenges which the updated security plan seeks to address are:

- illegal mining activity, which is the biggest challenge for MRM Security; and
- theft of rubies at various stages through the process.

The current security plan involves 493 personnel from “QRT”, “FIR” (for anti-illegal operations), “ARKHE” and Chelsea guards. With the planned expansion that increases the surface footprint of the operations, the security plan proposed by MRM will have the following key components:

- subdivide the operational area into three security blocks / zones which are further subdivided into smaller zones for better control and coordination;
- each zone would have an operating base with elements of QRT, FIR and ARKHE and Chelsea; a dedicated expatriate security officer would be in charge of each security zone;
- additional radio communications between zones and operating bases; and
- necessary equipment to support the security operation including training, dedicate vehicles, communications and GPS devices, spotlights, torches and digital cameras / recorders.

8.9 Utilities

8.9.1 Power

The entire operation is running on power supply connected 12.6 km up to mine by EDM (Electricidade de Moçambique is an energy company of Mozambique) with 3 phase 33 KV line voltage. Diesel generators are also installed at mine and camp to provide power when the fixed connection is interrupted to ensure operations remain unaffected.

A 1100 KVA & 250 KVA diesel generators are installed at processing unit for backup for processing unit as well mine office.

Two diesel generators comprising 250 & 200 KVA in line for equal distribution of electrical load have been installed for the increased power requirement at Namanhumbir camp.

8.9.2 Communications

The communication systems at the operation are closely linked to the existing and proposed security measures. Currently, the support infrastructure benefits from a WiFi connection and operatives utilise two-way radio communications. Security monitoring utilises CCTV and biometric identification for personnel daily attendance records.

8.9.3 Fire/Dust Suppression

MRM operates conventional bowsers to suppress dust generation on all roads. Fire extinguishers are located at all operational and support assets with an 18,000 litre fire appliance planned to support the future operation.

The CP recommends that appropriate measures are developed to mitigate dust generation on waste, ore and reject stockpiles and this is documented within the proposed waste management plan.

8.9.4 Potable Water

There are 7 boreholes on site, of which five have received potable water certification. A single borehole supports the Namanhumbir camp with water pumped to elevated tanks for domestic and sanitary consumption (Figure 8-6). Raw water is treated by a small reverse osmosis plant in the kitchen prior to use by kitchen staff for food preparation. Drinking water is imported in bottles. The CP recommends that a more detailed seasonal water balance is developed to ensure that storage and water treatment infrastructure will be sufficient to support the increased workforce and this water balance is accompanied by adequate flow sheets to demonstrate sufficiency.

Figure 8-6: Namanhumbir Camp Potable Water Storage Tanks

8.9.5 Foul Water

Foul and domestic waste water from the Namanhumbir camp is collected and reticulated to septic tank and soak pit.

8.9.6 Processing Water

MRM maximise the recycling of water within the wash and DMS plants via the thickener overflow tank. Tailings decant water is pumped back to this tank. Detailed water usage figures are not available but the CP understands that the plant recycles 93% of the water used. Make-up demand is drawn from a nearby reservoir. The make-up reservoir is formed form an earth dam constructed in the valley of a seasonal water course. During the dry season, the reservoir is replenished by six boreholes. However, the CP understands that this has not been required since operations commenced in 2012.

The CP has recommended that a more detailed water balance is developed to optimise the reservoir capacity to accommodate demands from the increased production. This is being undertaken by MRM and will include an assessment of downstream water users to understand potential limits on discharge flows and sediment control.

8.9.7 Surface Water Management

MRM is in the process of enhancing the infrastructure to capture, manage and discharge storm water on roads, earthworks slopes, pit slopes, stockpiles and the process make-up water reservoir dam. This will ensure that existing infrastructure, material stockpiles and mining operations are protected and the sediment transportation is minimised to prevent silting of downstream water courses.

Specifically, for the reservoir dam, the proposed spillway needs to be constructed to allow excessive flows to bypass the reservoir without eroding the toe of the retaining dam.

8.10 Operating Expenditures

The cost of operating the camp and ancillary activities has been appropriately captured and is presented in Table 12-2 in Section 12.1. The CP has reviewed the costs and considers them to be appropriate for the location and type of operation.

8.11 Capital Expenditures

Capital investment in the camp and support facilities is planned to support the expansion and the associated increase in manpower. As part of the CPR process, the CP has reviewed the costs and considers them to be suitable for the planned expansion.

8.12 Conclusions

Based upon the work undertaken to date, the CP concludes the following:

- The Project is well served in terms of infrastructure. The CP does not foresee any serious issues with current or planned arrangements.
- Water management is probably the most significant issue to address on an on-going basis. The CP notes that current and planned actions will ensure that infrastructure will not adversely impact on the Project's performance.

8.13 Recommendations

Based upon the work undertaken to date, the CP recommends the following:

- MRM continues with its planned program of investment in infrastructure.
- Investments in water infrastructure, roads and community support should be prioritised as these will have the most significant impact on the operation

9 ENVIRONMENTAL

9.1 Introduction

The Montepuez operation is located in northern Mozambique approximately 170 km inland of Pemba as described in Section 1.2. Gemstones are currently extracted from gravels that are mined from a series of shallow open pits, up to 20 m deep.

The Environmental and Social elements of the operation were assessed by the CP with reference to a number of international standards including the requirements of the IFC Performance Standards. The IFC PS are specifically referenced as a requirement of the Equator Principles. The Equator Principles is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects. The assessment was carried out in September 2017 and included a 3 day site visit by SRK's John Merry.

9.2 Environmental and Social Setting

The Maninge Nice Pit areas have intact Miombo woodland forest and remnants of forest vegetation reaching a height of approximately 15 to 20 m. At the Mugloto pit areas, the vegetation comprises long grasses and the natural Miombo woodland has been disturbed by subsistence farming activities for maize and other subsistence crops. The mining concessions are located 11 km south of the Quirimbas National Park.

The mining concessions are located within the districts of Montepuez and Ancuabe. Five villages (Mpene, Namanhumbir, Nanune, Nseue and Nthoro) are located within the mining concessions or on the periphery of the concession boundaries with a total population of over 8500 inhabitants. Originally the inhabitants of Nseue, Nthoro and Mpene were identified for potential resettlement but a rationalisation programme, applying IFC principles of minimising the need for resettlement, has left only one village as requiring relocation. As a result, the resettlement programme is now limited to 115 families compared to approximately 440 families previously identified. Subsistence crops commonly grown include maize, rice, beans, cassava, pumpkins and sorghum and fruit trees.

The MRM operation is the first formal mining activity to take place in the Montepuez region. In 2015 it was estimated that approximately 1500 illegal miners were active in various parts of the mining concession (SRK 2015). Actions in subsequent years by the Mozambique authorities, supported by MRM contracted security staff, has significantly reduced the numbers actively accessing the MRM permit areas. Such enforcement of MRM's rights over the licence areas has potential for a backlash from local communities. It was apparent, however, that the artisanal miners were predominately migrants to the area both from other areas of Mozambique as well as neighbouring countries. It appears the removal of the artisanal workers combined with a proactive community assistance programme has negated any negative reaction from the local communities.

MRM employ a significant number of contract security staff (over 400) who are involved in both ensuring security at the mine infrastructure sites as well as patrolling the licence areas. Conflicts between security personnel and illegal miners do occur and MRM has invested heavily in training to ensure good practice is applied with respect to human rights during any encounters. MRM also provides assistance when the illegal miners are involved in accidents, frequently fatal, and usually involving collapsed pits or tunnels.

9.3 Licencing and Permits

9.3.1 Mozambique Environmental Legislation

Mozambican environmental legislation is generally well developed. The Environmental Law No 20/97 and its Regulations establish the guidelines and rules applicable to all sectors of activity.

The Environment Law of 1997 sets the foundation of a whole set of legal instruments for the protection of the environment. It requires licensing activities which are dependent on an appropriate level of EIA. In 1998 the first Regulation on EIA was established (Decree 76/98 of 29 of December) which set out the EIA process. This Regulation was abolished and replaced by a new one in 2004 (Decree 45/2004 of 29th of September), which was partially replaced in 2008 (Decree 42/2008 of 4th of November). In 2015, a new regulation on the process of environmental impact assessment was established (Decree 54/2015), thereby replacing the Decrees 45/2004 and 42/2008.

In addition to Decree 54/2015, sectoral specific regulations were also issued in 2015 in the form of Decree 31/2015 of 31 December: Regulations of the Mining Law.

The new Decree on Environmental Impact Assessment (54/2015) stipulates that for the mining and oil sector specific environmental regulations apply. For mining projects, the environmental impact assessment process is supervised by the National Mining Institute and the relevant national or provincial department, depending on the size of the project. In addition, the Regulations of the Mining Law (31/2015) establish that social impacts of mining projects need to be identified and addressed.

Other important laws from an environmental and social perspective and of relevance to mining include the Mining Law No 20/2014 (dated 18 August 2014), the Land Law No 19/97, the Water Law No 16/1991 and the Wildlife and Forest Law No 10/91.

Mining holding permits (Article 7) are granted to applicants that satisfy the requirements in the mining law and in other applicable legislation. The Mining Law requires that mining activities are undertaken in conformance with environmental legislation. Article 11 states that the holder of a right to use and enjoyment of land may require an authorisation for mineral water exploitation, in accordance with applicable legislation.

Article 44 states that prior to the beginning of any development and extraction operation in the area covered by the concession, the mining concession holder is required to obtain the following primary environmental approvals:

- an Environmental Licence;
- a right to use and enjoyment of the land (Land Use Permit, termed a “DUAT”); and
- an approval for the compensation and resettlement plan (RAP).

9.3.2 Mining Concession Environmental Requirements

There are a number of environmental requirements specified in legislation pertaining to mining concessions. The Mining Law (Article 36) states that holder of mining rights has obligations to comply with provisions contained in the Environmental Impact Study (EIA) and to develop necessary actions regarding environmental protection according to the EIA. Other relevant requirements are:

- mining activities must be undertaken according to good mining practices to ensure preservation of biodiversity, minimise waste and protection against adverse effects to the environment (Article 68);
- mining activities carried out under a mining concession are classified as Category A (Article 69); and
- an EIA is required for Category A mining activities (Article 70).

The Mining Law includes specification on mine closure. The National Institute of Mines (Article 26) is responsible for reviewing and approving rehabilitation and closure. Articles 43, 44, 47 and 71 refer to the requirement for environmental restoration and mine closure to be performed in accordance with a Rehabilitation and Closure Plan approved by the relevant authority. Article 71 also makes reference to how the performance bond, if required, should be used.

The new Decree of 2015 has introduced the categories of A+, A, B and C to cover all projects. Projects that are categorised as A+ require a full EIA as well as an independent expert to advise on the quality of the EIA. Projects characterised as A require a full EIA, category B projects a simplified EIA, and category C projects have to comply with General Procedures of Good Practice in Environmental Management. However, the new Decree stipulates that for the mining and oil sector specific environmental regulations apply. According to these specific regulations (Decree 56/2010, 34/2015, 31/2015) mining and oil projects cannot be classified as A+, but only as A, B or C projects. Also, the terms and conditions for biodiversity offsetting/counterbalancing are regulated in specific legislation.

9.3.3 Environmental Licence

Several pieces of mining and environmental legislation guide the process to be followed when undertaking the EIA. They also guide the review of the Environmental Impact Assessment (EIA) reports by the Ministry of Lands, Environment and Rural Development (MTADR) and subsequent issuing of Environmental Licences by MTADR.

9.3.4 Land Use Permit

Land in Mozambique belongs to the State. The State may grant to natural or legal persons the right to use and enjoy land subject to the social and economic use to which it is proposed to be put. In principle, the holder of a mining concession has the right to apply for land use title in accordance with Article 28 of the Land Law Regulations Decree 66/98 and Article 12 of the Mining Law. A land use permit issued in connection with a mining concession has the duration of that concession.

Most occupiers and users of land in potential mining areas do not have official title to the land, but the Land Law treats them as if they do have land rights. In rural and urban areas, the right to use and benefit from all or part of the land, whether or not official title has been issued and registered, may be revoked and thus extinguished in the public interest.

The Land Law clearly states that such revocation is subject to the prior payment of a just indemnification and/or compensation.

The Land Law does not refer to the procedures to be followed when land rights are to be extinguished. It does confer allocation rights on different levels of Government and these apply to the revocation of rights as well. Where small areas of land are involved (<100 ha), the Provincial Governors can deal with such issues and declare land rights to have been withdrawn from an individual, entity or community. The Land Law does not refer to the possibility of appeal against revocation of rights.

MRM has obtained a DUAT that covers the current area of operation and is awaiting approval of the permit for the full licence area.

9.3.5 Stakeholder Engagement

Mozambican mining, land, and EIA legislation all require stakeholder engagement throughout the planning of a large-scale mining project. Consultation with local communities that will be affected by a mining development is particularly important. The legislation requires that there is formal disclosure of information about the Project (the proposed development, the EIA process, the EIA findings and proposals to address impacts) to the public and that the concerns of the public are heard, recorded and formally addressed.

Proponents of large-scale mining projects are encouraged to establish formal, documented agreements with the national and provincial government and the local communities on measures for the management of impacts of the Project.

9.3.6 Resettlement/Compensation

Decree 31/2012 of 8 August 2012, sets out the Regulation for any resettlement process resulting from economic development. In September 2014 'Ministerial Diplomas' were published that relate to the implementation of Decree 31/2012. These include:

- Ministerial Diploma 155/2014 of 19 September - Internal Rules for the Operation of the Technical Committee for Monitoring and Supervision of Resettlement; and
- Ministerial Diploma 156/2014 of 19 September - Technical Directive on the Process for the Elaboration and Implementation of Resettlement Processes.

In addition to the specific legislation, there are several Laws and Regulations that deal with various components of resettlement such as: Constitution of the Republic of Mozambique (2004); Law of the Land (Law No. 19/97 of 1 October); Regulation of the Land Law (Decree No. 66/98 of 8 December) with its Technical Annex; and National Land Policy (Resolution No. 1095 of October 17). The Mining Law and regulations also refer to resettlement and compensation, specifically Article 30, 31 and 41 of the Mining Law which refer to the fair compensation for families or communities located on land required for mining activities.

9.3.7 Water Concessions

In terms of the Water Law, all water resources are the property of the State. The MRM mine requires an extraction permit from the Regional Water Administration for various water uses.

9.3.8 Mining Contract

Article 8 of the Mining Law states that the Government may enter into a mining contract with the holder of a mining concession. The mining contract, among other clauses, should contain the following:

a) State participation in the mining venture;

b) Minimum local content;

c) local employment and technical-professional training programmes;

d) incentives for the increase of value of the minerals;

e) social responsibility activities to be developed by the mining holder;

f) memorandum of understanding between the Government, the company and the community(ies);

g) dispute settlement mechanisms, including provisions related to the settlement of any such disputes through arbitration; and

h) the way communities of the mining area are engaged and benefitted by the venture.

9.3.9 Status of Environmental and social studies and approvals

Mining Concession

In February 2012, the Mozambican government granted MRM a mining and exploration license for the two adjoining mining concessions 4702C and 4703C, which cover an area of approximately 33,600 ha. These were dated 11 November 2011 and valid for 25 years. Bulk sampling began in August 2012 and the operation has now evolved into full scale mining with a number of pits being mined and bulk sampled. In December 2015, MRM were granted a consolidated Mining Concession which combined the two concession areas under 4703C (ref 1588/CM/INAMI/2015) valid until 11 November 2036.

The beginning of full scale development and mining was subject to a number of conditions including the receipt of:

- an Environmental Licence; and
- authorisation for use and enjoyment of the land (DUAT).

Environmental Impact Assessment

MRM has received approval for its original EIA. The authorities have now instructed the MRM to upgrade the EIA from a Category B to Category A. At the time of the SRK visit, this work was being carried out by the consultants Geo-Ambiente. The CP understands that this will lead to the requirement for a new Environmental licence in due course. The scope of the EIA includes the new DMS plant and associated infrastructure, but not the planned recovery house.

Environmental License

MRM was originally granted Environmental Licences by the Ministry of Environment (by the Governor of the Province of Cabo Delgado), for Category B Projects, on 9 March 2012 for mining on the Mining Concessions 4703C and 4702C (Environmental Licenses 006/2012 and 007/2012, respectively). These licenses expired on 28 November 2016. Following the recent approval of the EIA and RAP, MRM applied for a new licence on 15 August 2017.

MRM holds a valid approval of the Resettlement Action Plan (RAP), and was issued a Category "A" Environmental License during October 2017 that is valid until August 2019.

The 'Borrow Pit License' was obtained from the relevant authorities, permitting MRM to extract soil for internal roads maintenance.

Land Use Permit (DUAT)

MRM has obtained a DUAT for a portion of the concession area covering all the current activities. MRM has applied for a DUAT for the remaining area and are awaiting this approval. MRM have no reason to expect that this permit would not be approved.

MRM has applied for two separate DUAT (two licenses; 4702 & 4703) prior to their amalgamation. These cover a total area of 256.66 km².

- The first DUAT for license no. 4703, covering 76.41km² was approved in December 2016.
- The second DUAT for license no 4702 for an area of 180.25 km² is still pending and is expected to be issued by end December 2017.

Resettlement Action Plan (RAP)

MRM has completed a detailed Resettlement Action Plan (prepared by Genesis Consultants). In addition to the legal framework outlined above, the RAP document also references the following laws: Territory Planning Law (Law No. 17/2007 of 18 July); Regulation of the Law of the Ordinance of the Territory (Decree Nº 23/2008 of 1 of June); and Regulation on the Exhumation of Bodies (Decree No. 42/90 of 29 December). The RAP has been developed in line with the requirements of the International Finance Corporation Performance Standard No. 5 for Land Acquisition and Involuntary Resettlement.

The RAP was formally approved by the Mozambique authorities on 4 August 2017.

Water Use License

MRM holds a valid water licence granted at the end of 2016. The licence is valid until December 2020 and covers extraction from 8 boreholes on the mining concession. Impounded surface water is not specifically included in the licence. Given the positive relations with local authorities and with no other competition for water use, renewal of this licence is expected to be routine and not considered a material risk.

9.4 Stakeholder Engagement and Social 'License' to Operate

MRM now has in place a well-developed community development programme. The process leading up to the implementation for the various CR projects demonstrates a high degree of consultation as an on-going process. It is not clear whether there is a formal system for documenting and analysing the numerous engagement meetings.

MRM has formally committed 0.75% of its revenue to corporate social responsibility initiatives and 0.25% to environmental initiatives specifically involving wildlife. MRM is now actively implementing a number of social development projects including school building, and support for poultry farming and agriculture. A number of the social projects such as the construction of schools in Namanhumbir and Nanune have been commended at a national level in Mozambique. MRM has also implemented a mobile clinic to provide primary health care to some of the more remote villages around the concession.

9.5 Approach to Environmental and Social Management

Gemfields has made a high-level commitment to sustainability at the corporate level and has an Environmental Policy and a Societal Policy. A group sustainability team exists and the Board of Gemfields has an HSEC committee who are responsible for receiving and signing off revisions of this policy. The Environmental Policy commits to EIA, EMP and biodiversity assessment and action plan, EMS to conform to ISO 14 0001 and OHSAS 18001 and commitment to continuous improvement and regulatory compliance; internal monitoring and measurement of environmental performance and third party audits to ensure conformance with regulations and an environmental management system.

On site in Mozambique there is a strong commitment by the management team to deliver on the Gemfields commitments. The management team includes dedicated safety and environmental personnel. The site has started to develop a number of plans and operational procedures; this process needs to be completed for all the high-risk areas of the operation.

MRM has been proactive in the management of hazardous wastes and have contracts with approved waste management companies who provide off site waste handling and disposal for all the main mine wastes including used oils.

MRM has just completed the installation of an incinerator at the accommodation camp that will be used for specific waste that cannot be treated off site. This will include combustible office and camp waste.

There is a comprehensive air quality monitoring programme also in place.

Management and monitoring of water appears to have had less focus. The focus to date has been the management of slurry water from the washer and DMS areas but storm water management has not been considered. It is not clear if there is a well-developed understanding of the aquifer used for the process water supply.

9.6 Closure Planning and Cost Estimate

As required under Mozambique law, a closure plan and closure cost estimate has been developed as part of the EIA. The costs of on-going rehabilitation for mined out areas are included in the financial model projections for MRM. In addition to this, MRM has allocated a provision of USD25 M for closure. This is to cover the cost of removal of all equipment from the site, rehabilitation of all the remaining disturbed areas on site and pay staff retrenchment costs.

The CP notes that rehabilitation of the open pits concurrent to mining operations is a key closure objective. Improvements have been made in the stripping and storage of topsoil, but topsoil stores can still be improved (the material depth exceeds ideal topsoil storage guidelines and there is no attempt to revegetate the stored soil).

9.7 Key Risks

9.7.1 Primary Environmental and Social Approvals

MRM has completed the required EIA and RAP for the mine but is now playing catch up with changing legislation and the evolving MRM operation. The CP understands that the newly approved Category A EIA will have to be updated to include the planned new recovery house. There is a risk the mine will be constantly revising and amending the scope of the EIA and therefore may have to further update its environmental licence and EMP.

9.7.2 Resettlement

MRM has followed a thorough and comprehensive process for the planned resettlement. Physical models of the proposed new village have been produce for consultation purposes and a full-scale model house has been constructed. This has allowed MRM to get sign off from all the families earmarked for resettlement and this has been approved by the Mozambique authorities. The process of implementing a resettlement project always throws up unexpected challenges. In addition, it will be difficult to limit in-migration to the village in the two year period before the resettlement is implemented (in the period between the first and second census, the number of families had increased from 93 to 115).

9.7.3 Site Environmental and Social Management

MRM is yet to implement all of the required environmental management actions identified in the EMP linked to the EIA. Specific environmental and social issues that require better management are highlighted below.

Surface water management and pollution control measures require improvement:

- Water ponding and hydrocarbon spillage at the vehicle wash pad has been improved but appears to be under sized for the expanding operation and associated vehicle fleet.
- Downstream water users of the mining operations have not been identified and mapped.
- The water management paddocks are in a natural depression and there does not appear to be adequate capacity to manage storm water run-off. This could lead to uncontrolled discharge of water from site that will inevitably contain high suspended solid loads.
- Detailed seasonal water requirements need to be assessed and mapped to the capacity of the groundwater aquifer being used.

Soil management requires improvement:

- Planned erosion control measures have not been fully implemented around overburden and waste stockpiles.
- The overburden (top 2-3 m) stockpiles need better erosion controls and large gullies form during the rainy season. Some of these stockpiles may remain for the full 25 year life of mine. This soil needs to stabilised to prevent erosion into nearby local streams.
- Pre-striping of soil and vegetation prior to creating of waste and soil dumps needs to be improved to maximise the use of the topsoil and vegetation resources.
- As noted above the size of the mine nursery needs to be increased significantly to address the future requirements to close and rehabilitate mined out areas and waste dumps. Consideration should be given to a more industrial approach to revegetation such as hydro-seeding.

Dust management needs improvement:

- Dust management measures for the waste, dried slurry and ore stockpiles could be improved. This is linked to the need for a more comprehensive approach to revegetation.

9.8 Conclusions

Based on the investigations carried out for this CPR, the CP concludes the following:

- The operation consists of a medium scale surface mining facility that should have limited impact on the local environment providing that the environmental and social management initiatives contained in the EMP are appropriately planned and implemented.
- The implementation of the EMP arising from the EIA is in its infancy with significant progress in specific areas but only the basics in place in terms of systems and procedures.
- The largest environmental management risk is dealing with water quality related issues such as sediment and erosion control. This can be mitigated through a number of simple management measures, which are yet to be implemented.
- The permitting process should not be a material risk to MRM, however, it will require on-going close supervision and management effort to ensure it progresses smoothly.
- The most significant risk at MRM is the implementation of the Nthoro resettlement programme.

References for the S&E section

http://www.eia.nl/en/countries/af/mozambique/eia (accessed 25 October 2017 – site updated 8 May 2017)

http://www.samcode.co.za/samcode-ssc/samval (accessed 25 October 2017 – specifically the SAM ESG Guideline)

10 COMMODITY PRICES AND MACRO-ECONOMICS

10.1 Introduction

Rubies, along with sapphires, belong to the corundum mineral type. It is the hardest of the coloured gemstones, second hardest among natural minerals after diamonds. Rubies are extremely rare and are believed to be associated with the plate tectonic processes, subduction and collision, found in a range of hues in only a few localities in the world.

Ruby value is primarily dependent on the vividness of colour and fluorescence, with the most valuable ruby colour traditionally being the so-called ‘pigeon’s blood’ which has been described as pure red. The red colour of the rubies is produced by chromium. Additionally, if the iron content present in corundum is low, the ruby becomes fluorescent. The silky iron rutiles present in the gem mask the possible windows and give the gem a uniform silky colour, very common for Burmese marble-type gemstones. When the iron level is high, a more transparent less fluorescent crystalline structure is formed, common for the Thailand basalt-related rubies. The iron content of amphibole-type Mozambique rubies falls in between the iron-rich Thai rubies and the iron-poor Burmese gems, producing gems distinguished by high transparency, vivid red colour and good fluorescence.

10.2 Ruby Formation and Mining

Ruby deposits are formed under metamorphic growth conditions. Ruby deposits can be classified into two main categories: either metamorphic or magmatic-related. Metamorphic deposits (referred to as ‘Met’), such as those in Myanmar, have specific metamorphic environments, such as marble in which the rubies are found. Magmatic-related deposits (referred to as ‘Mag’) require eruptive events to transport the rubies to the surface such as those gemstones from Cambodia and Thailand and the rubies are found in basalt. There is, however, a third, newer group, the amphibolite-type which has properties outside of the first two groups, such as the rubies from Malawi, Tanzania, Madagascar and Mozambique. These rubies are found in amphibole-related deposits and fill the gap in terms of chemical composition and colour, between the highly fluorescent rubies found in marble rocks and the weakly-fluorescent basalt-type rubies.

Rubies can be recovered from primary or secondary sources: the primary being the rocks where they are formed, or a secondary location where they have been transported. A large amount of rubies which were originally embedded in rock were washed out due to erosion and can be found in former and recent rivers, known as ‘alluvial deposits’. Corundum is largely found in alluvial deposits. Rivers can transport gemstone bearing rock many hundreds of kilometres. These deposits are found below the surface of the riverbed and manual labour is required to extract the rock and soil in order to examine it for gemstones. In ruby deposits such as those found in Mozambique, the alluvial deposits may be between 1 to 10 m below the surface.

10.3 Historical Background – Major Ruby Deposits

Historically, rubies have been mined in Southern Asia and more recently, Eastern Africa. New significant and commercially viable deposits were discovered in Mozambique in the beginning of the twenty first century.

High quality rubies have traditionally been produced in Myanmar (previously Burma) and Kashmir. Later, rubies were mined in Thailand, Madagascar and Tanzania.

Myanmar has always been regarded as the world’s most important source for rubies as well as the largest producer of by volume for a significant period of time, however, lack of investment in the industry and other factors resulted in exhaustion of the existing mines and decline in Myanmar’s overall market share. Based on recent production and the work carried out at the Project, Mozambique is currently believed to be the most significant ruby find in the world since Myanmar.

10.3.1 Myanmar

Rubies were originally mined in the historic area of Mogok in the Mandlay region, a valley ('Valley of the Rubies') surrounded by mountains, reported by many as having some of the world's finest rubies as well as being the standard against which other ruby sources are compared. Since the mid-1990s, large deposits of lower quality rubies have also been found at Mong-Su in the Shan state. These rubies tend to be a deeper or darker in colour than the Mogok rubies, however, all of these resources have largely been exhausted. Furthermore, the mining of rubies and other gemstones in Myanmar has been the subject of international scrutiny and subsequent trade bans. In 2007, the EU imposed sanctions on precious gemstones and the USA imposed a ban on rubies and jade from Myanmar the following year. USA restrictions are still in place, while the EU lifted its measures in 2013 after government reforms. It must be noted that the Mogok mines, which have been closed for the past decade, have recently been reopened. It is noted that foreign miners and investors are not able to invest in the sector since the government has only allowed for domestic firms to mine.

10.3.2 Kashmir

The mining operation in Kashmir is situated in an extremely remote and mountainous terrain, consisting of two main workings (at 14,300 feet [4,360 m] and 12,500 feet [3,810 m]) that are accessible only from May to October because of the severe weather. These factors contribute to Kashmir as a source of rubies having limited commercial viability.

10.3.3 Thailand – Cutting and Polishing Hub

Significant ruby deposits were found in Thailand in the second half of the twentieth century. The Thai gemstone treatment industry started developing because it was discovered that the darker red tone of a Thai ruby could be improved through heating. This, combined with other finds of rubies in Madagascar and the new Mong-Su deposit in Myanmar, which can also be enhanced, later resulted in Thailand becoming one of the major manufacturing hubs for coloured gemstones. The major corundum mining areas in Thailand are Chantabun and Battambang and the largest ruby cutting factories are in the Chanthaburi district as well as Bangkok. Thai rubies were important to the market because of the scarcity of Burmese rubies, however, Thailand has declined as a corundum supplier, yet it has firmly maintained its position as the world's premier cutting and polishing hub for corundum. Furthermore, as Thailand decreased as a major coloured gemstone supplier, Thai businesses acquired rough ruby (and sapphire) supplies from other regions as well as developing treatment methods to produce greater quantities and qualities of finished goods. It has been reported that 90% of the world's rubies pass through Thailand and it, together with India, are renowned for being the world's leading coloured gemstone manufacturing and trading centre.

10.3.4 Other Significant Ruby Deposits

There are a number of ruby deposits situated in approximately 20 countries. Afghanistan and Cambodia have some of the oldest known ruby deposits, yet production is sporadic and, like Kashmir, the locations are remote. Rubies were also found in Vietnamese district of Luc Yen in the 1980s and more recently in the Tanzanian provinces of Songea and Winza, however, the quantities were small and the quality of the ruby was inferior. In 1966, ruby districts were reported in Greenland and a mining company, LNS Greenland, is currently exploring the Aappaluttoq area. Newer deposits discovered have been Australia, Kenya (Mangari), Malawi (Chimwadzulu), Madagascar (Andilamena and Vatomandry), Colombia, Russia, and the USA (Montana). Sri Lanka is another district rich in corundum, but mainly produces sapphires of very good quality.

10.3.5 Mozambique Discovery

Due to the remoteness of Kashmir deposits and the difficulties associated with Myanmar, the discovery of rubies in the Montepuez district in Mozambique in 2009 was an important development for the coloured gemstone industry. Gemfields acquired 75% of the Project as well as a 25-year mining licence. Gemfields is currently the world's single largest producer of coloured gemstones. Gemfields has predicted that the Project should account for around 40% of the world's ruby supply. In 2016, Gemfields reported that 10.3 Mct of rubies and sapphires were recovered at Montepuez. Gemfields plans to further its mining endeavours in Mozambique by exploring new districts.

The highlands of Northern Mozambique are dominated by a Precambrian basement section of the famous Mozambique Belt that extends up north to the Mediterranean. In this basement, large regions were metamorphosed at high temperature and high pressure during the Pan-African tectonic event, 800 to 550 million years, creating suitable conditions for the formation of gemstones. Deposits of the Pan-African Orogeny are much older than the Himalayan range gem deposits that are only 40 million years old. The ruby deposit of Montepuez is localised in the eponymous tectonic unity. This unit is mainly composed by strongly deformed gneiss and quartzite, with few marble lenses.

The production mostly consists of tabular hexagonal crystals, with some fine euhedral crystals from primary deposits, although such material is usually highly fractured and included. Rough gemstones showing abraded aspect due to weathering come from secondary deposits located over the primary deposit or along streams that passed over it. The material is composed of slightly tumbled crystals that are more transparent and less included than the rubies from primary deposits. This is due to the fact that rubies from secondary deposits are trapped during millions of years with other heavy minerals. Those heavily included and fractured are broken and turned into sand through weathering processes. In contrast, clean rubies are tumbled and concentrated in gem rich gravels. Therefore, the proportion of clean high quality gemstones is much higher in secondary / alluvial deposits.

The Montepuez rubies are invaluable to the ruby industry because of the range of sizes, quality and especially the wide range of colour and florescence of the gemstones potentially enabling the rubies produced to suit a large range of different markets and personal preferences. According to Vincent Pardieu, a renowned gemmologist, the main characteristics of Montepuez rubies are the following:

1. Purplish-red to red colorations with a slight milky haze;

2. Some exceptionally clean and clear crystals were observed. The exceptional quality gemstones represent about 1% of current yield; and
3. The most common internal feature of Montepuez gems is the presence of rounded transparent crystals, which under analysis by the Gemmological Institute of America (GIA) proved to be amphibole (any class of rock-forming silicate typically occurring as fibrous or columnar crystals).

This new and consistent source of rubies has had a considerable impact on the international market. Gemfields reported that at its initial ruby auction in Singapore, a record breaking USD33.5 M was raised in June 2014. Furthermore, at the prestigious 2014 Biennale des Antiquares, the Reine Makeda necklace by Cartier was presented which included a 15.29 carat, oval shaped ruby from Mozambique. These occurrences went a long way to distinguishing the gem quality ruby of this source from the 'composite' ruby product that has been associated with the Mozambique ruby.

10.4 Treatment of Rubies

A variety of treatments are applied to rubies to improve their quality to expand the market to a broader base, providing more commercial jewellery at competitive prices. This has had the effect of expanding demand and making the rubies more available and affordable in the market. More material available for sale has dramatically increased the demand for corundum in general (rubies and sapphires), as supplies were limited to those gemstones that possessed an attractive colour. In general, treated rubies are far more readily available than untreated gemstones and available to market at more affordable prices. Effective disclosure and consumer education on various gemstone treatments and the relative value of each type of gemstone continues to add value to the downstream market. The largest companies like Gemfields promote transparency and responsibility and are actively in educating both the downs stream market and the consumer alike.

There are three common ruby treatments. Firstly, high temperature heating, common in the 1970s, where the rubies are heated in an oven in a controlled environment to improve the colour and/or clarity of the gemstone. These heat treatments drastically improve the colour and clarity of the gemstones especially so for the mid to lower priced, commercial jewellery. The blue and/or purplish hue is removed leaving a purer, red colour.

Glass fill treatment is the second most common process. This is the latest treatment which has been developed to dramatically improve the appearance of low-quality ruby by infusing it with a high refractive index lead glass. It is also used to smooth out the appearance of heavily fractured gemstones. This treatment is so extensive that the new term 'Composite Ruby' was developed by the American Gemmological Laboratories to clearly identify and disclose this material.

The third is deep colour diffusion heat treatment that consists of diffusing elements such as chromium (for rubies) and titanium (for sapphires) into the structure of the colourless corundum from outside to change the gemstone colour.

10.5 Ruby Market Mechanisms

Once rubies are cut and polished, they are sold on the wholesale market globally. Historically, rubies were sold on an artisanal basis, however, Gemfields has endeavoured to transform the way rubies (and coloured gemstones in general) are mined and sold by grading, referencing and then putting them up for sale on its own auction platform. The proprietary sorting and grading system combined with considerable investments to provide the global market with consistent ruby supply are likely to transform the market and allow designers and jewellery brands to create collections rubies which can be consistently supplied throughout the global market. Gemfields second auction held in December 2014 included the sale of 62,936 ct, realising USD43.3 M which set a new benchmark for the quality of African mines and also confirmed the quality of supply the Montepuez Project can provide. An exceptional 40.23 ct rough ruby (dubbed the “Rhino Ruby” given its size and characteristics) from Montepuez formed part of the December 2014 auction.

10.5.1 Export Value and Quantity of Ruby per country

The coloured gemstone market is in a phase of fast growth, primarily due to the major economies’ recovery and growth combined with a fashion trend which has shifted towards coloured gemstones supported by Gemfields ability to supply a consistent supply of quality gemstones to the downstream markets and its intensive global marketing and communications efforts. According to the United Nations Commodity Trade Statistics Database, the international coloured gemstone industry has been growing at a Compound Annual Growth Rate (CAGR) of 19% for the last five years (2012 – 2016) and currently stands at USD8.6 billion. The emerald, ruby and sapphire market make up 87% of the coloured gemstone market and currently stands at USD7.5 billion, with 22% CAGR over the period, 2012-2016. The information is still largely lacking but it is estimated that rubies and sapphires make up for 50% of the world’s coloured gemstone market with the largest demand for rubies originating from Asia.

The gemstone industry is highly fragmented. Small to medium scale miners produce a large amount of the gemstones and do not declare their data. The world’s top gemstone manufacturing hubs, India and Thailand, experienced steady growth in their exports of emeralds, rubies and sapphires in 2016 of 9% and 8% respectively. Meanwhile, exports from Hong Kong, the main trading hub, more than doubled reaching USD2 billion (2015: USD1.3 billion). Asian markets and the USA regained momentum and showed extremely encouraging results with China, Japan and India growing by 92% (USD2.3 billion), 11% (USD1.4 billion) and 19% (USD0.08 billion) respectively, and the USA imports increasing by 8% (USD1.3 billion).

With regards to Myanmar, previously the world’s largest producer of rubies, it has been reported that rubies, along with other gemstones mined such as jade, is now the country’s fifth largest export and are still attracting the highest prices at international auctions.

Madagascar became a major producer of ruby with the discovery of the Andilamena and Vatomandry deposits in 2000 and other more recent discoveries. It was reported in 2016 by the United Nations Commodity Trade report that around USD22 M worth of precious and semi-precious stone were exported from Madagascar.

Mozambique has replaced Myanmar as the world's largest producer of rubies and according to the Gemfields 2016 update, approximately 10.3 Mct of ruby and corundum was extracted from the Montepuez Project in Mozambique in FY 2015-2016. It was reported by the 2015 United Nations Commodity Survey that the export value of gemstones from Mozambique totalled USD99.3 M. This is a significant increase from 2013, where it was reported that the Mozambique gemstone export totalled USD1.1 M. This significant increase is due to the discovery and production of rubies at the Montepuez Project and subsequent Gemfields auctions in Singapore. The international interest in rubies was also confirmed by the results of Gemfields' initial auctions. The first auction in Singapore generated USD33.5 M and the second, USD43.3 M. Gemfields also hosted a lower quality ruby auction in Jaipur, India, in April 2015, raising USD16.1 M and a higher quality auction in Singapore in June 2015 raised USD29.3 M. Gemfields' most recent ruby November 2017 auction achieved record auction revenues of USD55.0 M, an all-time high for any Gemfields auction. The nine Montepuez auctions held since June 2014 generated USD335 M in aggregate revenues.

10.5.2 Ruby Value

Due to its hardness, transparency, rarity and colour, ruby is considered to be one of the most valuable and expensive of all gemstones. It is accepted that large rubies are considerably rarer than diamonds of comparable quality and size. Rubies have been attracting outstanding prices at recent auctions. Rubies from Myanmar command the highest prices, this is partly due to the fact that these rubies hold colour in any lighting condition. The 'Burma brand' is heavily entrenched in the ruby market and still fetches the highest prices, even though the Mozambican ruby is comparable in colour quality. For instance, in 2014, the 'Graff ruby', a 8.62 ct Burmese ruby, from the collection of Greek financier, Dimitri Mavromatis, was bought by Laurence Graff for the record breaking price of USD8.6 M, making it just under USD1 M per carat. The 'Sunrise Ruby', a Cartier ring exhibiting a 25.59 ct pigeon's blood Burmese ruby, surrounded by diamonds, has been valued between USD12 – 18 M. For a non-heated Burmese ruby, a 2 ct ruby can fetch prices of 200% to 300% more than a treated gemstone, however, in the enhanced category of rubies, country of origin no longer plays a definitive role. *The Gem Guide* reports that heated Mozambique rubies under 3 ct are averaging prices approximately 75% of a heated Burmese ruby.

The price ratio between 1 carat extra fine upper quality brilliant cut diamonds and unheated Burmese rubies at the present time somewhere around USD20,500 / USD20,700 per carat. Mozambican rubies with the same characteristics would fetch around half of the Burmese gem at around USD 12.000 per carat. The particular shade of colour shown by a ruby has a considerable influence on its value.

Dr Peretti believes that the market recognition of Mozambique ruby has steadily risen in recent years with the equivalent per-carat values of these gemstones having tripled. Mozambique gemstones are, however, still selling for about half the price of comparable Burmese (Myanmar) rubies. The consensus is that although Mozambican rubies will continue to be available well into the future, high auction price results for Burmese (Myanmar) rubies will ultimately continue to drive up ruby prices for all origins.

Table 10-1, Table 10-2 and Table 10-3 present the prices of 1.00 – 1.99 ct, corundum ruby (USD/ct.) from 2008 to 2016, respectively for treated rubies, untreated Burmese rubies and untreated Mozambique rubies. Figures for untreated Mozambique rubies are only available from 2014.

The following categories have been used: 'Commercial', 'Good', 'Fine' and 'Extra Fine'. Figures represent averages of the ranges given by The Gem Guide for respective categories. It is important to note the steady rise of prices from 2012 to 2013, this is largely due to the discovery of ruby deposits in Mozambique. There was a slight drop in some heated goods between 2013 and 2014. This is can be largely attributed to the increased supply of heated polished rubies as the Chinese market focused on non-heated (unenhanced) gemstones. However, the price for heated and unheated rubies alike started growing again in 2016.

Table 10-1: Corundum Ruby (Heated) Prices USD/ct (1.00 – 1.99 ct)

Period	Commercial	Good	Fine	Extra Fine
2016	294	1330	3348	7020
2015	245	1,108	2,790	5,850
2014	185	923	2,325	4,875
2013	185	923	2,175	5,525
2012	185	820	1,950	5,175
2011	185	820	1,950	5,225
2010	185	820	1,750	4,600
2009	185	820	1,750	4,600
2008	185	820	1,750	4,600

Source: 'The Gem Guide'

Table 10-2: Corundum Ruby (Unheated Burmese) Prices USD/ct (1.00 – 1.99 ct)

Period	Commercial	Good	Fine	Extra Fine
2016	874	2990	7993	20700
2015	475	2600	6950	18000
2014	475	2600	6950	18000
2013	465	2063	6200	22313
2012	465	1950	5450	19950
2011	465	1950	5450	19950
2010	415	1550	3900	14700
2009	-	1550	3900	14700
2008	-	1550	3900	14700

Source: 'The Gem Guide'

Table 10-3: Corundum Ruby (Unheated Mozambique) Prices USD/ct (1.00 – 1.99 ct)

Period (July/August)	Commercial	Good	Fine	Extra Fine
2016	630	2220	5700	12000
2015	525	1,850	4,750	10,000
2014	525	1,850	4,750	10,000

**Source: 'The Gem Guide'*

Note: Significant difference in prices for untreated rubies in the Commercial category of Mozambique and Burma origin is due to the fact that lower end commercial rubies from Mozambique are rarely available and The Gem Guide does not track these prices categories for Mozambique rubies

10.6 Ruby Grading

MRM sources two distinct types of rubies at the Project, these are from primary and secondary deposits. The characteristics of these products are different. Therefore, different grading processes are used. It should however be noted that there is a grading system developed and adopted by the Company for its auctions. There are 530 grades between primary and secondary ruby and is still evolving with each auction as more knowledge and experience is gained with various characteristics of Mozambican rubies.

10.6.1 Rubies from Primary Deposits

This tends to deliver higher grade production but of an overall lower value per carat. Most of these rubies are included with fractures meaning some of this material needs to be treated to make it more durable and hence saleable. After cleaning, the rubies are graded and sorted twice; by colour (very light pink to red) and clarity of the crystal (translucent to opaque) before and after treatment. After treatment, the fractures appear less visible and colour becomes more homogeneous resulting in fewer colour categories.

10.6.2 Rubies from Secondary Deposits

This tends to deliver lower grade production but the gemstones generally have a much higher per carat value. The majority of the rubies are very clean with good to exceptional colour. This is as a result of their alluvial origin. Only the most durable, highest quality rubies survive the weathering, erosion, transport and deposition processes over millions of years.

10.6.3 Ruby Heat Treatment

No rubies are currently heated on-site. All treatment is carried out at facilities in Thailand. MRM heated some of the commercial quality primary rough which was offered at the LQ auction with full disclosure in April 2015 and received a good market response to this material. The heating process is called borax heating and is a well understood and widely accepted treatment within the gemstone trade.

Some of the auction participants are not capable of conducting the process to optimally heat the ruby rough. The Company has learnt that offering properly treated rough at auctions makes this material more commercially attractive because no further treatment is required.

Due to the success of the heated rough material that has thus far been placed on offer at auctions the Company plans to continue to offer borax treated rough as part of the offering at LQ auctions as well as initial experimental heating trials for some of the darker tone secondary rough which is higher in quality but still requires some lower temperature heating to reduce the tone.

10.7 Historical Prices Achieved at Recent Auctions

The first Montepuez ruby auction, held in June 2014, comprised of a mixture of both higher and lower quality material, while the second and fourth auctions held in December 2014 and June 2015 respectively were composed of predominantly higher quality material. The April 2015 Jaipur auction was composed of predominantly lower quality material. The differences in auction mixes are a direct result of the Company’s desire to build its understanding of the downstream market in order to optimise its long-term ruby auction format. Auction attendees were drawn from Austria, China, India, Israel, Sri Lanka, Thailand, the United Kingdom and the USA. The auction results of the Montepuez auctions held to date are summarised in Table 10-4 and Table 10-5.

At the April 2015 auction, it is noted that of the 66 lots offered at the auction, 51 lots were offered on an untreated basis while 15 lots were offered as having been heat-treated (as was the case in the June 2014 auction where Gemfields offered both untreated and treated material). All of the treated lots offered used industry-accepted treatment techniques and were offered and sold on a fully disclosed basis.

It is reported by the Company that the proceeds of this auction would be repatriated to Montepuez Ruby Mining Limitada in Mozambique, in which Gemfields owns 75%, and with royalties due to the Government of Mozambique being paid on the full sales price achieved at the auction.

The historical prices achieved by product for all auctions and also direct sales of lower quality products are summarised in Table 10-6.

Table 10-4: Summary of MRM Auction Results 2014 to 2015

Auction Results (Ruby & Corundum)	June 2014 Auction	December 2014 Auction	April 2015 Auction	June 2015 Auction	ecember 2015 Auction
Dates	12-17 June 2014	3-8 December 2014	17-22 April 2015	16-21 June 2015	14-18 December 2015
Location	Singapore	Singapore	Jaipur, India	Singapore	Singapore
Type	Rough Ruby & Corundum (Higher and Lower Quality)	Rough Ruby (Higher Quality)	Rough Ruby & Corundum (Lower Quality)	Rough Ruby (Higher Quality)	Rough Ruby (Higher and Medium Quality)
Carats offered	2.03 Mct	85,491 ct	4.03 Mct	72,208 ct	92,136 ct
Carats Sold	1.82 Mct	62,936 ct	3.99 Mct	47,451 ct	90,642 ct
No. of lots offered	62	41	66	46	49
No. of lots sold	57	35	58	28	45
% of lots sold	92%	85%	88%	61%	92%
% of lots sold by weight	90%	74%	99%	66%	98%
% of lots sold by value	91%	97%	93%	87%	95%
Total auction sales	USD33.5 M	USD43.3 M	USD16.1 M	USD29.3 M	USD28.8 M
Average per ct sales	USD18.43/ct	USD688.64/ct	USD4.03/ct	USD617.42/ct	USD317.92/ct

Table 10-5: Summary of MRM Auction Results 2016 to 2018

Auction Results (Ruby & Corundum)	June 2016 Auction	December 2016 Auction	June 2017 Auction	November 2017 Auction	June 2018 Auction
Dates	13 – 19 June 2016	12 – 16 December 2016	10-14 June 2017	6-10 November 2017	5-9 June 2018
Location	Singapore	Singapore	Singapore	Singapore	Singapore
Type	Rough Ruby & Corundum (Higher, medium and Commercial Quality)	Rough Ruby & Corundum (Higher, medium and Commercial Quality)	Rough Ruby (Higher, medium and Commercial Qualities), no corundum	Rough Ruby (Higher, medium and Commercial Qualities), no corundum	Rough Ruby (Higher, medium and Commercial Qualities), no corundum
Carats offered	1,601,145 ct	1,372,145 ct	1,048,687 ct	682,508 ct	629,893 ct
Carats Sold	1,516,459 ct	1,094,406 ct	895,848 ct	605,229 ct	588,656 ct
No. of lots offered	75	76	83	76	86
No. of lots sold	71	58	78	71	82
% of lots sold	95%	76%	94%	93%	95%
% of lots sold by weight	95%	80%	85%	89%	93%
% of lots sold by value	98%	85%	98%	N/A	N/A
Total auction sales	USD44.3 M	USD30.4 M	USD54.8M	USD55.0M	USD71.8M
Average per ct sales	USD29.21/ctt	USD27.79/ct	USD61.13/ct	USD90.81/ct	USD122/ct

Table 10-6: MRM Historical Sales by Product 2014 to 1H 2018

All Auctions & Direct Sales	CY 2014		CY 2015		CY 2016		CY 2017		1H CY 2018		Total	
Product	**(ct 000's)**	**($/ct)**	**(ct 000's)**	**($/ct)**	**(ct 000's)**	**($/ct)**	**(ct 000's)**	**($/ct)**	**(ct 000's)**	**($/ct)**	**(ct 000's)**	**($/ct)**
Premium	46	1,461.77	49	984.17	58	803.16	57	1,048.31	31	1,377.04	240	1,097.81
LP + Ruby	42	154.20	627	30.79	1,620	16.07	590	75.56	263	109.73	3,142	39.86
Low Ruby	328	5.64	1,293	3.16	933	2.76	855	6.92	295	1.93	3,704	4.05
Corundum	1,460	0.65	1,147	1.60			220	2.08			2,827	1.15
Sapphire			970	0.10			240	0.67			1,210	0.21
Low Sapphire							7,050	0.15			7,050	0.15
-4.6	7	36.19	11	1.08			45	9.06			62	10.55
Reject with some Low Sapphire							2,710	0.05			2,710	0.05
Total	**1,882**	**40.85**	**4,097**	**18.07**	**2,611**	**28.65**	**11,766**	**9.51**	**589**	**122.03**	**20,356**	**16.59**

Note sales of Corundum, Sapphire, Low Sapphire, -4.6 and the Reject with some Low Sapphire in CY 2017 were all direct sales

10.8 Future Prices

In respect of the commodity price, the CP has not undertaken a detailed price analysis, but has reviewed the average prices received from all auctions to date in six different product categories and with guidance from Gemfields has forecast prices based on actual prices received in auctions to date in each of the categories (Table 10-6). The two main products making up 95% of revenue are the premium ruby and ruby. The average actual price achieved for premium emeralds at in all auctions to date is USD1098/ct and the lowest annual average price was in 2016 at USD803/ct. Gemfields have advised that it would be prudent to assume a price forecast of USD800/ct at the lower range of prices received to offset any potential risks regarding market volatility. With respect to the ruby product the price forecast is USD25/ct biasing towards the lower price achieved in 2016.

Table 10-7: Forecast Commodity Prices

Commodity Prices (USD/ct)	Sep 2018+
Premium	800.00
Ruby	25.00
Low Ruby	1.00
-4.6 mm	2.00
Corundum	0.10
Sapphire	0.03

10.8.1 Comment

The CP notes that these forecasts are not derived in line with the SAMREC diamond reporting definition however, the CP consider that coloured gemstone deposits are not necessarily directly comparable in nature to diamond deposits and in certain cases the direct application of the diamond reporting code to the gemstone sector is not generally appropriate. There are a number of significant differences that differentiate between diamonds and gemstones deposits and how the products are evaluated and marketed. The following points summarise the CP's opinion in this regard:

- Coloured gemstone deposits generally contain larger numbers of medium and lower value stones to make up the parcels of stones whereas diamond projects comprise generally fewer stones but of substantially higher value. In line with this, grades for diamond mines are normally reported as carats per 100 tonnes where as it is normal to quote the grades for MRM as carats per tonne. There is typically 100 x more mass of coloured gemstones per tonne of ore than for a diamond deposit. The impact of this is that for gemstones the focus is not on individual stones and their exact size distribution and more on the average value per carat based on large parcels that have been carefully graded to be a similar size and colour and are sold at auction;

- The diamond industry is highly standardised with companies such as DeBeers and Alrosa investing considerable sums into research and evaluation activities over the last 60-70 years. The diamond industry has a long established standardised system of stone grading, classification and pricing. The coloured gemstone industry has no such system. As a result Gemfields has developed its own system of gemstone classification which it has applied to the relatively large parcels of stones that have been sold at auction in nine auctions held over the last four years. The CP considers that the results of these sales are likely to provide a far more reliable price estimation for the products than the mechanism adopted in diamond industry which is not market validated or by using predictions from a consultant. The grading system allows Gemfields to sell parcels of stones with similar properties to cutters who can use this to plan long production runs of certain types of jewellery;
- Modern diamond project evaluation often relies on a microdiamond analysis which requires knowledge of stone counts and particle size distribution. There is no analogy to this with coloured gemstones. Therefore, stone counts are not a relevant measure when assessing a gemstone deposit; and
- Bottom screen size is applied in the diamond sector but is not something that has much relevance in the coloured gemstone sector. The important aspect in terms of assessing the value of the deposit is how much of certain grade of stone there is available. Fine stones (less than 1.6mm) that are not recovered in the plant are ignored because they are not considered marketable. The focus of the assessment is on what stones have been recovered and the prices that those stones have received at auction.

The CP does not consider the commodity prices used to be unreasonable. The use of actual prices achieved at auctions to date to guide the forecast is also considered reasonable. The following charts show the 4½ year actual prices achieved and the forecast prices used for premium, LP+Ruby and the average for the other products. As can be seen the forecast prices look reasonable relative to historical prices, if not conservative.

As can be seen the forecast prices for premium product aligns with the historical prices in 2016 with the added proviso that Gemfields felt it prudent to cap prices at this level for this product to remain conservative on projections.

With respect to the LP+Ruby price forecast with significant sales in 2016 and low price realised again the forecast price has been biased towards the 2016 price.

With respect to the other products these contribute less than 5% of revenue. Gemfields again considered it appropriate to adopt conservative prices. However, as can be seen in the graph below. The CP concurs with this approach as it is conservative.

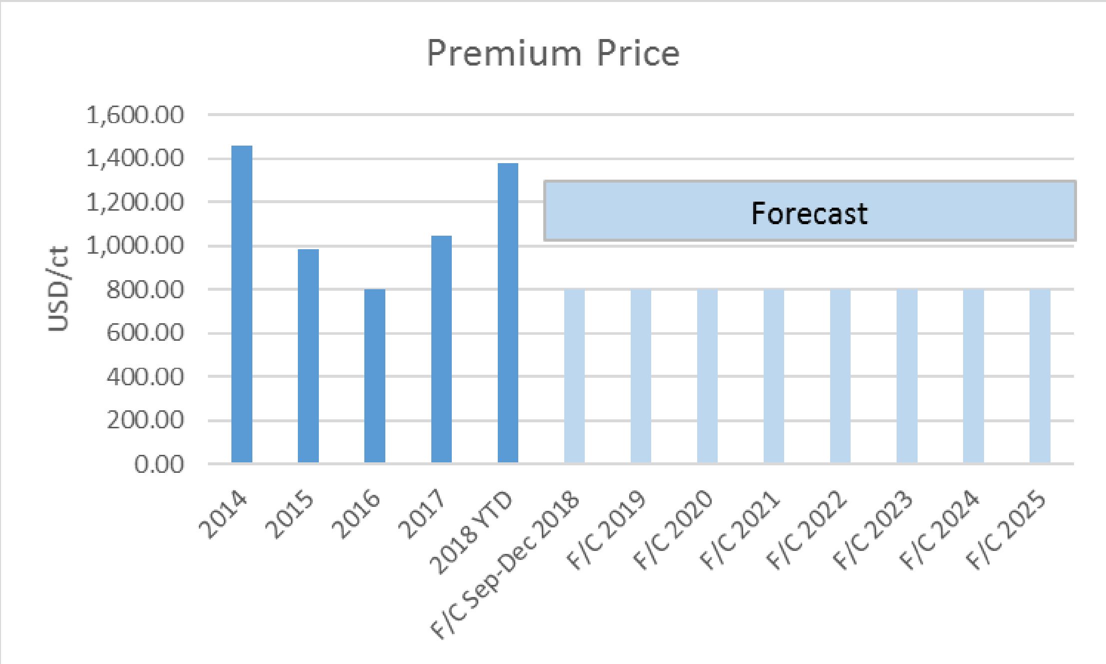

Figure 10-1: Historical and Forecast Premium Price

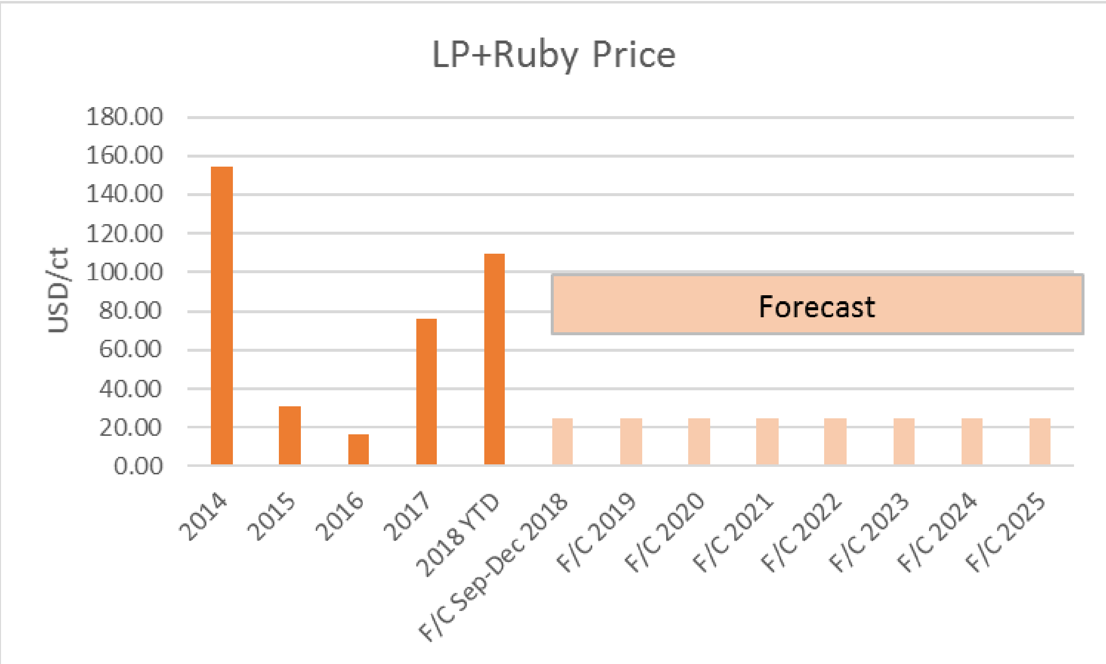

Figure 10-2: Historical and Forecast LP+Ruby Price

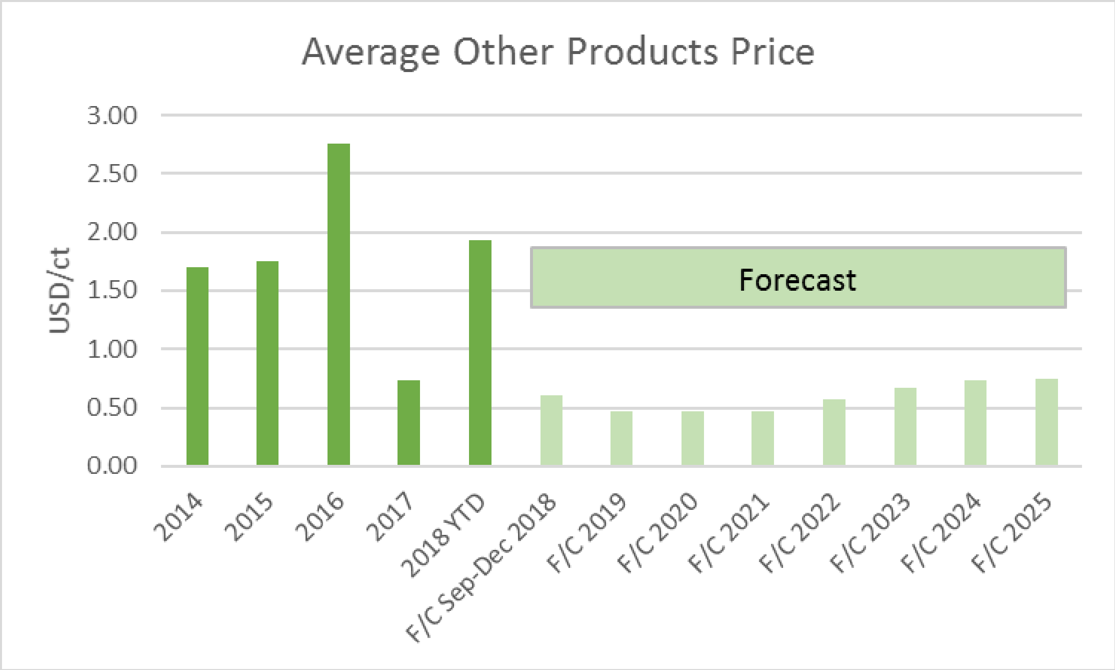

Figure 10-3: Average Historical and Forecast Price for Other Products

10.9 Future Sales

Ruby and emerald put together occupy a miniscule single digit market share in the total gemstone sphere, and therefore has a huge potential for growth. Awareness among consumers is constantly rising about responsibly produced colour gemstones. The margins in colour gemstones are higher than that for diamonds. Historically, colour gemstone sector has been severely constrained by supply both in quantity and reliability. With assurance of consistent supply in volumes, the market space for ruby is poised to grow significantly.

The demand and supply rule work well in an efficient and mature market space. For example, the last ten years of Kagem operation has seen three-fold increase in emerald production and seven-fold increase in price. This was achievable by ensuring consistent and reliable supply supported by marketing efforts to build market confidence. The colour gemstone sector continues to remain underdeveloped.

With planned augmentation of mining and washing capacity in place, the project looks to build up stockpile of products. That will be of help in stabilising supply to the market, and effectively neutralising the impact of grade variability.

There is a strong demand for ruby and is expected to remain increasingly so. The market is ready to absorb most of the low-end categories, even more than what is being produced currently. The lower quality material sells best in larger volumes. These are being presently held back to build stock. Various parcels of the low-grade material, in the entire range of it, have been sold in the past, and we are confident that this segment of the product profile will be sold on an ongoing basis. Even if some part of it (particularly tail end of -4.6 mm product) remain unsold, it will not have any material impact on the revenue stream.

10.10 Challenges to the Ruby Market

There is great potential in the market for Mozambique rubies. Gemfields is in the process of implementing necessary strategies to raise awareness and international demand for rubies from Mozambique.

It is noted, however, that there are several challenges that the Gemfields faces with the market for rubies:

- In the coloured gemstone industry, a significant part of mining continues to be artisanal with small, local mining operations using very primitive methods. These organizations do not declare the amount of corundum mined. Consequently, estimates of the world's production are largely unavailable.
- With regards to consistent ruby pricing, the issue of reconciling the price disparity which currently exists in the market between Burmese and non-Burmese rubies remains a challenge.

10.11 Gemstone Marketing Strategy

The following paragraphs have been provided by Gemfields to support their stated objective to secure 40% of the world ruby market.

The global market has recently witnessed a phenomenal rise in demand for coloured gemstones. This was primarily linked to the general trends in the fashion industry towards revealing the significance of colour, the growing economies of the developing world, increasing importance of ethics and transparency in business and realising the investment value of coloured gemstones.

Gemfields has invested significant sums of money marketing an industry that has never seen such if any formal coordinated marketing efforts in the past and revealing the value of the Mozambican rubies both to the trade and consumer.

To be able to market effectively, Gemfields had to be able to guarantee constant supply of these gemstones to the global market and make sure Mozambican rubies are available on the market in the key geographies. In order to achieve this, the Company keeps in the region of six to 12 month's ore stock balance at any given time and manages its inventory carefully to meet the growing market demand. Through its auction platform and cut and polished sales department, Gemfields is able to directly reach to its target customers. The MRM operation has over 30 year's life with the capacity to provide sustainable ruby supply to the market throughout this period and beyond.

Gemfields initial Mozambican ruby marketing efforts were focused on trade participants. Starting from 2013, Gemfields initiated targeted trade advertising campaigns through trade publications and presence at the major trade shows to support increased awareness and demand for its Mozambican rubies. Gemfields Global launch of its brand ambassador, Mila Kunis, in 2013, featured ruby jewellery advertising and collaboration with various jewellers to create show pieces using Mozambican rubies.

Currently, Gemfields continues to market Mozambican rubies as a high-end gemstone in collaboration with jewellers, artists and designers. The marketing and communications focus now has shifted towards the end consumer as firm foundations have already been created within the trade community.

Gemfields and the Company will continue with trade education and auction participant support programmes; however, the main marketing focus will be directed at the broader end customer base. Below are some of the planned and past initiatives:

- Gemfields former brand ambassador, Mila Kunis, had launched a ruby film featuring six international designers Mozambican ruby jewellery in London with a series of events between 23-25 June 2015, including a dinner with retailers and investors, press interviews, a cocktail party and a photo shoot for a major UK publication.
- A Ruby Book was unveiled in 2017, following on from its earlier and highly acclaimed Emerald book.
- Ruby advertising will consist of innovate advertising campaigns, including the film. Originally with Mila Kunis and other more abstract art focussed campaigns. A solely Gemfields focused campaign will run simultaneously with other collaborative campaigns together with some targeted retailers and jewellers. This project will be both trade and consumer focussed.
- Gemfields is creating a jewellery collection in conjunction with a top US retailer that will have a high profile launch on 2nd December, which will then create assets that can be used in advertising and editorials.
- Gemfields will continue to develop ruby collections with jewellers in all markets that will be promoted through advertising, events, films and editorial. The Company has PR companies in the US, Zambia, Mozambique, China and the Middle East to facilitate these initiatives.
- Gemfields will continue to sponsorship/exhibit at all key events in the trade and media that deliver opportunities to educate the market with respect to Mozambican rubies, for example IIJS, Gem Awards, Trade shows, Salon QP, Women for Women gala event – She Inspires Art, etc.
- Gemfields will continue to offer its numerous business partners business additional support in the form of promotional materials, training sessions and films.
- Gemfields will continue to promote coloured gemstones, focussing on rubies, on all our social media channels with include Facebook, Twitter, Instagram, Google Plus and a new blog which we will launch in July to celebrate July as the month of the ruby.
- Having researched the Chinese market a significant potential with respect to further increasing demand for rubies has been identified.

In conclusion, Gemfields and the Company is paying significant attention to doing business in a responsible, transparent, ethical and broadly communicated way. From responsible environmental practices, recognised labour and social policies, to safe mining operations, transparent auction process, accountable government engagement all the way through to the final customers Gemfields believes that integrity is a key driver of demand for its product. By addressing major social, environmental, health and safety, transparency issues Gemfields believes it can satisfy its stakeholders' expectations and maximise value as a business.

11 RISKS AND OPPORTUNITIES

11.1 Introduction

The following section includes a summary of the principal risks and opportunities as they may relate to MRM and seeks to identify and quantify the potential impact should such a risk or opportunity materialise. In certain instances, the analysis is limited to qualitative assessment only and accordingly no direct financial impact can or has be determined.

In all likelihood, many of the identified risks and/or opportunities will have an impact on the cash flows as presented in Section 13 of this CPR. The CP has provided sensitivity tables for simultaneous (twin) parameters, which cover the anticipated range of accuracy in respect of commodity prices, operating expenditures and capital expenditures. The CP is of the view that the general risks and opportunities are, with the aid of the sensitivity tables, adequately covered. Specifically, these largely address fluctuations in operating expenditure and commodity prices.

In addition to those identified above, MRM is subject to specific risks and opportunities, which independently may not be classified to have a material impact (that is likely to affect more than 10% of MRM's annual post-tax pre-finance annual operating cash flow), but in combination may do so.

The CP has further reviewed the risks identified below in accordance with their potential likelihood and associated consequence of risk in order to derive an overall risk measure classified as low, medium or high. It is however important to note that the classification of specific risks with an overall risk measure of medium or high does not necessarily constitute a scenario which leads to *"project failure"*. Where appropriate, the CP has classified all specific risks with a medium risk or higher as the most material risks to which MRM is subject.

Certain of the specific risks identified comprise either generic risk elements which are adequately addressed by the various twin-parameters sensitivities analysis undertaken or which do not readily lend themselves to quantitative analysis. The specific risks which fall into such categories are: commodity price risk; foreign exchange and CPI risk; water management risk; occupational health and safety risk and cost of production risk.

11.2 Risks

The MRM is subject to certain inherent risks and opportunities, which apply to some degree to all participants of the international mining industry. These include:

- **Commodity Price Fluctuations:** these many be influenced, inter alia, by commodity demand-supply balances for gemstones, specifically rough and cut rubies and sapphires. In all cases, these are critically dependent on the demand in the primary sales markets in which cut gemstones are consumed, an indication of which is the disposable income as generally reflected by the projected growth in GDP. Furthermore, the sales price varies significantly between both rough and cut gemstones and within the specific grade categories. Historical prices as recorded for the MRM production are largely based on a weighted average price received from auctions. Accordingly, the CP notes that increased production of coloured rubies and sapphires has the potential to adversely impact the market price for rough and/or cut rubies and sapphires. Increased production could come from MRM or other parts of the world where gemstones could be mined.

- **Foreign Exchange and CPI Risk:** CPI for each specific country/currency is impacted by the assumed relationship between exchange rates and the differential in inflation between the respective currencies, that is, purchase price parity or non-purchase price parity. Given the low exposure to non USD related expenditures as noted by MRM, the overall foreign exchange risk is however considered immaterial.
- **Country Risk:** specifically country risk including: political, economic, legal, tax, operational and security risks.
- **Legislative Risk:** specifically changes to future legislation (tenure, mining activity, labour, occupational health, safety and environmental) within Mozambique.
- **Mineral Resource/Mineral Reserve Estimation Risk:** the presence of premium quality gemstones may be more erratic than indicated from the bulk sampling undertaken to date. It is possible that certain parts of the deposits are richer than others and this has not yet been fully appreciated at this stage of the Project life. In addition, the market for some of the lower quality stones could be overestimated leaving some stones unsold at auction.
- **Water Management Risk:** the principal risk relates to having sufficient water during dry periods to sustain gravel washing operations. The related issue to this is managing the impact of dewatering and discharge on water resources used by the local community.
- **Environmental and Social Risks:** largely related to issues surrounding artisanal mining in and around the concession area. The experience of other mining operations across the globe would indicate that there is always a risk of uncontrolled inundation of the mining areas by artisanal miners. Should this issue not have been properly identified and managed by the Company production may be prevented from taking place. Related to this is the risk that local communities become dissatisfied with MRM and engage in civil unrest forcing suspension of operations. Other environmental risks largely relate to certain deficiencies of environmental documentation and management. Areas of environmental documentation that could be improved include: development of a detailed closure plan in accordance with local regulations, enhancement of the baseline characterisation of the Project area; and development of a stakeholder engagement plan and management systems to include commitments for on-going relationships with the local communities.
- **Economic Performance Risk** is largely addressed by the combination of the assessment economic performance criteria and the accompanying sensitivity tables as included in Section 12 of this CPR.

11.2.1 Risk Assessment Methodology

The CP has completed a risk assessment in respect of the MRM which largely draws upon the issues highlighted in Section 11.2. The CP notes that such assessments are necessarily subjective and qualitative, however, where quantification is possible, the consequence rating has been classified from minor to major:

- **Major Risk:** the factor poses an immediate danger of a failure, which if uncorrected, will have a material effect (>15% to 20%) on the Project cash flow and performance and could potentially lead to project failure;
- **Moderate Risk:** the factor, if uncorrected, could have a significant effect (10% to 15%) on the Project cash flow and performance unless mitigated by some corrective action; and
- **Minor Risk:** the factor, if uncorrected, will have little or no effect (<10%) on project cash flow and performance.

The likelihood of any specific risk materialising has also been assessed and falls into three categories:

- Likely: will probably occur;
- Possible: may occur; and
- Unlikely: unlikely to occur.

The degree or consequence of a risk and the likelihood of occurrence has been combined into an overall risk assessment the matrix for which is presented in Table 11-1.

Table 11-1: Overall Risk Assessment Matrix

Likelihood of Risk	Consequence of Risk		
	Minor	**Moderate**	**Major**
Likely	Medium	High	High
Possible	Low	Medium	High
Unlikely	Low	Low	Medium

11.2.2 Specific Risk Assessment

Table 11-2 presents the results of the specific risk assessment as considered applicable to MRM. On this basis, three key specific risks have been classified with an overall risk of low to medium and thereby material in the overall specific risks identified in Section 11.2.1 of this CPR.

Table 11-2: MRM Project Risk Assessment before mitigation

Hazard Risk	Likelihood	Consequence Rating	Overall Risk
Legislative Risk			
Revision to the current fiscal terms	Unlikely	Moderate	Low
Mineral Resource/Mineral Reserve Risk			
Impact of erratic distribution of premium gemstones	Possible	Moderate	Medium
Environmental and Social Risk			
Impact of strained relations with local communities	Possible	Moderate	Medium

11.3 Opportunities

The principal opportunities with respect to the MRM are largely constrained to:

- **Mineral Resource** potential increases through completion of successful exploration drilling at the MRM and the broader area within the licence.
  - upgrading of the Inferred Mineral Resources and the unclassified secondary material (approx. 40Mt) to Indicated and Measured through additional exploration.
- **Mineral Reserve** potential increase through:
  - refining current estimates with further exploration drilling and bulk mining to help to calibrate the estimation process and better define the presence of high value gemstones;
  - the market for some of the lower quality stones could be under estimated resulting in higher prices for these products than those presented; and
- **Plant Throughput** improvement through implementation of an expansion beyond that planned in this LoMp. the CP notes, however, that further production rate increases are likely to be contingent upon the capacity of the world market for rubies.

11.4 Summary Comments, Risks and Opportunities

The risk and opportunity assessment undertaken for MRM and specifically the current LoMp and accompanying Mineral Reserves, indicates that there are opportunities to substantially increase the current Mineral Resource through further exploration. The principal risks which require management to mitigate their negative impacts are as follows:

- **Legislative and Permitting Risk.** MRM should maintain the current good relations with government to ensure permits are approved in a timely manner and to lobby for no negative changes to the mining fiscal regime.
- **Mineral Reserve Estimation Risk**. The expected variation in mined grade from month to month will require some buffering between production and sales activities. MRM has stated an intention to hold a surface stockpile next to the plant equivalent to approximately 6 months to 12 month's production to meet this objective. In addition, MRM is planning to hold significant quantities of rough gemstones in secure storage facilities. The CP considers this to be adequate, but has also recommended that mining blocks are delineated with further sampling prior to mining to predict future production more accurately.
- **Water management.** Hydrogeological investigations are required to assess long-term water requirements and careful day-to-day management is necessary to ensure that zero discharge of silty water to the environment is maintained.
- **Environmental and Social Risks.** MRM has made significant efforts to maintain good relations in the local communities through a number of social initiatives. The CP considers that the approach being applied is appropriate but needs to be maintained and enhanced through to be effective in the medium to long term.

12 ECONOMIC ANALYSIS

12.1 Introduction

For the economic analysis the CV has constructed an independent technical economic model (TEM) for the Mine as described in Section 1.2 of this CPR. This economic analysis has been undertaken in accordance with SAMVAL to support and as part of this CPR. This CPR has been prepared to support the reporting and sign off by the CP's of Mineral Resources and Mineral Reserve estimates in accordance with SAMREC Code as requested by the Client. The Client requires the CPR at the request of the JSE following the recent acquisition of Gemfields. The economic analysis is estimating the "Intrinsic Value" value of the mines Mineral Reserves and is not a market valuation of the Company.

The Scope of Work for the financial and valuation aspects of the CPR was primarily an update of the 2015 CPR authored by SRK:

- **Financial:** SRK will update the financial model for the operation which will bring together the production profiles, capital costs, operating costs and price profiles. The model will be expressed in real terms, post tax and pre-finance. The model will generate NPV, IRR and payback. The LoMp report will contain an appropriately detailed commentary on the financial assessment.
- **Valuation:** SRK will add a chapter in the CPR which values the assets in accordance with the SAMVAL Code.

The valuation date of the TEM is 1 September 2018. The CV is not aware of any material changes that may have occurred between the valuation date and the report date. Further, as this is supporting the declaration of Mineral Reserves the valuation has been prepared and presented on a 100% basis for the Mine and does not reflect the value attributable to Pallinghurst. Again, it is noted that the Mine is 75% owned by Gemfields which in turn is 100% owned by Pallinghurst.

The TEM has been developed based on forward looking statements and forecasts with respect to production schedules, operating costs, capital costs and fiscal regime. Forward looking statements and forecasts are not guarantees of future performance or results. They involve risks, uncertainties and assumptions. Future results of operations and financial conditions may be materially different from those described in these forward-looking statements and forecasts. Potential risks and opportunities have been discussed in Section 11 of this CPR and the sensitivity of results is further addressed in Section 12.6.4.

The Competent Valuator (CV) for this valuation is Mr Keith Joslin BEng ACSM MSAIMM, an Independent Consultant with SRK. Mr Joslin has 30 years' experience in the mining industry and has been involved in the valuation of mineral assets across many commodities during his career to date.

12.2 Key Assumptions

The TEM reflects production, capital and operating expenditures and revenues from 1 September 2018 through to 2034 on an annual basis. Total ore treated over the LoM amounts to 21.6 Mt at an average grade of 9.11 ct/t. The TEM is based on the forecast production by the CP and audited capital and operating costs based on historical figures. For the purposes of the TEM base case the CV has capped the premium content in the Mugloto Secondary area at 8% of contained carats in line with the actual achieved production over 2016 and 2017. The CV has presented a base case from a Mine perspective reflecting the full charge on mine of management and auction fees.

Under the instruction of the JSE, the CPR and TEM has been prepared from the perspective of the MRM operation. Certain cost items incurred by the mine are intercompany charges between MRM and it's major shareholder, Gemfields. These charges are shown as management and auction fees in this analysis and total 12.5% of revenue. Gemfields have stated that the effective cost of providing these services is 1.75% of revenue with Gemfields accruing the difference as revenue before tax. The CP has not independently verified this.

In addition, the TEM:

- is based on an income approach with discounted cash flow analysis undertaken on estimated future cash flows;
  - the CV notes that a market approach was not considered due to the lack of similar comparable market transactions to allow a comparative valuation;
  - as MRM is an operating concern that has generated significant positive cashflows a cost to date approach was also not considered;
- is expressed in constant money terms;
- is presented at September 2018 money terms for Net Present Value (NPV) calculation purposes;

- applies a Base Case discount rate of 10%;
  - the CP considers a 10% discount rate to be appropriate for this type of mine within the jurisdiction it is operating. This discount rate also aligns with the Mine's WACC of 9.9%. NPV values are also presented at 8% and 12% discount rates;
- commodity prices are derived and adjusted from average prices received at auctions to date as provided by Gemfields;
- is expressed in post-tax and pre-financing terms and assumes 100% equity;
- uses a corporate tax rate of 32%;
- includes royalties at a rate of 10% of revenue;
- does not deduct royalties from the taxable profit for the determination of tax payable;
- includes Land Tax at USD1/ha per year on 33,600 ha;
- for the Mine perspective includes management overheads and auction fees at 2.5% and 10% of revenue respectively;
- has no historic assessed tax losses to be carried forward;
- ignores VAT; and
- depreciates capital investment on an annual fixed percentage basis as per the fiscal regime of Mozambique. It has been assumed that all capital items have been fully depreciated and at the end of the mine life there is no terminal value to consider.

12.3 Modifying Factors

This valuation has been prepared as part of this CPR and the modifying factors are as described in the preceding sections of this report.

This CPR has been prepared based on a technical and economic review by a team of consultants (Section 1.7) sourced from the SRK Group's offices in the United Kingdom over a nine-month period. These consultants are specialists in the fields of geology, resource and reserve estimation and classification, open-pit mining, mineral processing, tailings management, infrastructure, environmental management and mineral economics.

In preparing this valuation reliance has been placed on the SRK team and this CPR and the CV is satisfied with the technical information provided by this team. Key modifying factors include mining and environmental adjustments as summarised below. No other material issues have been identified.

Key modifying factors are:

Mining

As described in Section 5.7 Modifying Factors applicable to the derivation of reserves comprise estimates for the selective mining unit. The Modifying Factors considered by the CP to be appropriate for the secondary mineralisation is based on the greater of:

- a 0.3 m dilution skin to both the hangingwall and footwall contacts; or

- a minimum total thickness of 1.5 m. The diluting grade density has been assumed at 2.01 t/m^3. Owing to the application of historical factors to derive RoM grades, no additional dilution or other grade adjustments factors are deemed necessary for the primary mineralisation.

Grade capping has been applied to the Mugloto secondary mineralisation to limit the grade of the higher value gemstone based on historically mined averages. Where historically achieved percentage, split showed an average split above 8% of premium ruby, this was capped at 8%. Since revenue was found to be very sensitive to the premium ruby grades and quality split, this capping was employed historically to ensure that revenue is not overstated.

The TEM is based on the Mineral Reserves, of 1,131 kt of primary material grading at 97.88 ct/t ruby and 20,498 kt of secondary material grading at 4.21 ct/t ruby.

Environmental

As described in Section 9 the Environmental and Social elements of the operation were assessed by the CP with reference to a number of international standards including the requirements of the IFC Performance Standards. The IFC PS are specifically referenced as a requirement of the Equator Principles. The Equator Principles is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects.

As required under Mozambique law, a closure plan and closure cost estimate has been developed as part of the EIA. The costs of on-going rehabilitation for mined out areas are included in the financial model projections for MRM. In addition to this, MRM has allocated a provision of USD25 M for closure. This is to cover the cost of removal of all equipment from the site, rehabilitation of all the remaining disturbed areas on site and pay staff retrenchment costs.

12.4 Commodity Prices

In respect of the commodity price, the CP has not undertaken a detailed price analysis, but has reviewed the average historical prices received from all auctions to date in six different product categories and with guidance from Gemfields has forecast prices based on actual average prices received in auctions to date in each of the categories. Details on historical prices are presented in Section 10.7. Projected prices for the various products are presented in Table 12-1. The two main products making up 95% of revenue are the premium ruby and ruby. The average actual price achieved for premium emeralds at in all auctions to date is USD1098/ct and the lowest annual average price was in 2016 at USD803/ct. Gemfields have advised that it would be prudent to assume a price forecast of USD800/ct at the lower range of prices received to offset any potential risks regarding market volatility. With respect to the ruby product the price forecast is USD25/ct biasing towards the lower price achieved in 2016.

Table 12-1: Commodity Prices

Commodity Prices (USD/ct)	Sept 2018+
Premium	800.00
Ruby	25.00
Low Ruby	1.00
-4.6	2.00
Corundum	0.10
Sapphire	0.03

12.5 Revenue, Operating Costs and Capital Costs

The LoMp assumes that overall production from all sources will average an annual rate of 1,500 ktpa. Over the LoM of 16 years based on the current indicated resource, it is planned to sell 203 Mct, of which 3.6 Mct are Premium ruby, and will generate USD3,459 M in gross revenue (undiscounted). Note of the 203 Mct sales 197 Mct is from future production including the current RoM stockpile. The balance of 6 Mct comes from stock inventory. The CP has scheduled the mine plan resulting in a stripping ratio of 3.5 t:t.

Operating costs have been based on the historic costs and are summarised on a unit basis in Table 12-2. Average total operating costs for the Base Case Mine perspective are estimated at USD56.81/t treated with total operating costs amounting to USD1,229 M over the life of mine.

Table 12-2: Unit Operating Costs

		Mine Perspective
Operating Costs	**(USD/t total moved)**	**(USD/t Treated)**
Mining and production costs	**3.98**	**17.02**
Labour costs - mining and production	1.46	6.22
Fuel costs	0.60	2.56
Repairs and maintenance	0.46	1.96
Camp costs	0.39	1.68
Blasting costs	0.00	0.00
Security costs	0.72	3.06
Other mining and processing costs	0.36	1.53
Administrative expenses		**3.79**
Labour - G&A		1.15
Selling, marketing and advertising		0.03
Rent and rates		0.13
Travel and accommodation		0.45
Professional and consultancy		0.44
Office expenses		0.18
Share based payment (options)		0.00
Other administrative expenses		1.41
Management and auction fees		**19.99**
Mineral royalties and production taxes		4.00
Royalty		15.99
Land Tax		**16.02**
Total Operating Cost		15.99

The total capital expenditure is estimated to be USD219 M over the LoM, as summarised in Table 12-3. Capital for engineering and mining has been estimated at USD95 M and the wash plant at USD14 M. Ongoing exploration capital is estimated at USD10 M. Sustaining capital for the on-going operations is estimated to be USD74 M. Closure costs are estimated at USD25 M.

Table 12-3: Capital Expenditure

Capital Costs	LoM (USDM)
Engineering and Mining	**94.9**
Excavators	10.8
ADTs	56.2
Tippers	15.2
Dozers	3.2
Wheel Loaders	9.2
Backhoe	0.4
Exploration	**10.0**
Wash Plant & Sort Plant	**14.4**
Wash plant 1	0.3
Wash plant 2	9.9
Sort house and Sorter	4.2
Security	**0.3**
I.T.	**0.3**
Other & Sustaining	**74.3**
Closure	**25.0**
Total Capital	**219.1**

12.6 Results

12.6.1 Base Case Mine Perspective Cash Flow

Figure 12-1 provides an analysis of Mine cashflow over the LoM, while Table 12-4 provides a summary of the key financial parameters from the TEM and Table 12-5 and Table 12-6 present a summary of the results of the financial modelling.

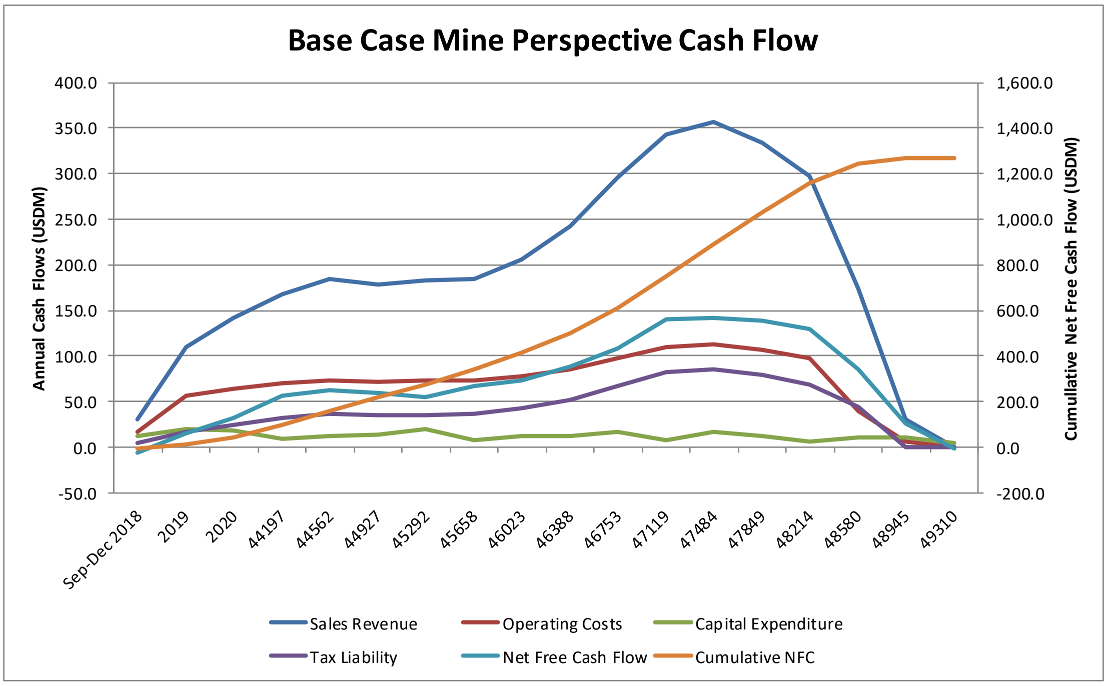

Figure 12-1: Base Case Mine Perspective Net Cash Flow

Table 12-4: Base Case Mine Perspective Summary of LoM Financial Parameters

		Total LoM
Sales Revenue	(USDM)	3,459
Operating Costs	(USDM)	1,229
Operating Profit - EBITDA	**(USDM)**	**2,230**
Tax Liability	(USDM)	743
Capital Expenditure	(USDM)	219
Net Free Cash Flow	**(USDM)**	**1,268**
Total Waste Mined	(kt)	71,767
Total Ore Mined	(kt)	20,647
S/R	(kt)	3.48
Total Ore Treated	(kt)	21,629
Grade	(ct/t)	9.1
Contained ct	(ct 000's)	197,015
Stock Inventory	(ct 000's)	5,633
Total Sales	(ct 000's)	202,648
Mining and production costs	(USD/t Treated)	17.02
Administrative expenses	(USD/t Treated)	3.79
Management and auction fees	(USD/t Treated)	19.99
Mineral royalties and production taxes	(USD/t Treated)	16.02
Total Operating Costs	**(USD/t Treated)**	56.81
Revenue	(USD/ct)	17.07
Operating Costs	(USD/ct)	6.06
Operating Profit	**(USD/ct)**	**11.00**

Table 12-5: Base Case Mine Perspective Cash Flow Summary Years 1 to 10

Year			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Period - Beginning			1-Jan-18	1-Jan-19	1-Jan-20	1-Jan-21	1-Jan-22	1-Jan-23	1-Jan-24	1-Jan-25	1-Jan-26	1-Jan-27
	Units	Total/Ave										
Production Mining												
Total Waste	**(kt)**	**71,767**	**1,669**	**4,993**	**5,007**	**4,993**	**4,993**	**4,993**	**5,007**	**4,993**	**4,993**	**4,993**
Total Ore	**(kt)**	**20,647**	**366**	**1,400**	**1,504**	**1,500**	**1,500**	**1,500**	**1,504**	**1,500**	**1,500**	**1,500**
Total Material Moved	**(kt)**	**92,415**	**2,035**	**6,393**	**6,511**	**6,493**	**6,493**	**6,493**	**6,511**	**6,493**	**6,493**	**6,493**
Stripping Ratio	**(t:t)**	**3.48**	**4.56**	**3.57**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**	**3.33**
Processing												
Total Ore Treated	**(kt)**	**21,629**	**366**	**1,400**	**1,504**	**1,500**	**1,500**	**1,500**	**1,504**	**1,500**	**1,500**	**1,500**
Total Grade	**(ct/t)**	**9.11**	**25.12**	**2.02**	**1.94**	**3.03**	**16.65**	**23.25**	**22.87**	**23.31**	**13.30**	**3.11**
Total Content	**(ct 000's)**	**197,015**	**9,194**	**2,831**	**2,912**	**4,541**	**24,969**	**34,865**	**34,399**	**34,955**	**19,953**	**4,671**
Carats Sales Calculated												
Total Sales	**(ct 000's)**	**202,648**	**2,657**	**6,207**	**2,872**	**3,727**	**14,755**	**29,917**	**34,632**	**34,677**	**27,454**	**12,312**
Premium Ruby	(ct 000's)	3,558	30	112	155	183	179	144	141	143	183	253
Ruby	(ct 000's)	19,760	187	647	658	816	1,350	1,802	1,825	1,798	1,630	1,266
Low Ruby	(ct 000's)	12,780	186	440	138	184	1,238	2,318	2,315	2,254	1,754	722
-4.6	(ct 000's)	50,717	658	1,414	380	503	2,907	7,822	10,596	10,761	8,248	3,141
Corundum	(ct 000's)	13,831	253	542	205	284	1,831	2,735	1,972	1,819	1,466	684
Sapphire	(ct 000's)	102,002	1,342	3,051	1,336	1,757	7,249	15,096	17,784	17,901	14,172	6,247
Commodity Prices												
Total Sales	**(USD/ct)**	**17.1**	**11.42**	**17.64**	**49.26**	**45.03**	**12.49**	**5.98**	**5.27**	**5.31**	**7.52**	**19.62**
Premium Ruby	(USD/ct)	800.0	800.00	800.00	800.00	800.00	800.00	800.00	800.00	800.00	800.00	800.00
Ruby	(USD/ct)	25.0	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Low Ruby	(USD/ct)	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
-4.6	(USD/ct)	2.0	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Corundum	(USD/ct)	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Sapphire	(USD/ct)	0.0	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Revenue												
Total Revenue	**(USDM)**	**3,458.8**	**30.3**	**109.5**	**141.4**	**167.8**	**184.3**	**179.0**	**182.5**	**184.1**	**206.4**	**241.6**
OPERATING COSTS, Real												
Mining and production costs	(USDM)	368.1	7.04	25.65	25.86	25.83	25.83	25.83	25.86	25.83	25.83	25.83
Administrative expenses	(USDM)	82.0	2.20	5.65	5.75	5.75	5.75	5.75	5.75	5.75	5.75	5.75
Management and auction fees	(USDM)	432.3	3.79	13.69	17.68	20.98	23.04	22.37	22.81	23.02	25.80	30.20
Mineral royalties and production taxes	(USDM)	346.4	3.07	10.98	14.18	16.82	18.47	17.93	18.28	18.45	20.67	24.19
Total Operating Costs	**(USDM)**	**1,228.9**	**16.1**	**56.0**	**63.5**	**69.4**	**73.1**	**71.9**	**72.7**	**73.0**	**78.0**	**86.0**
CAPITAL COSTS, Real												
Engineering and Mining	(USDM)	94.9	4.5	2.2	12.6	2.7	6.0	8.3	13.8	2.0	6.2	6.4
Exploration	(USDM)	10.0	0.2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Wash Plant & Sort Plant	(USDM)	14.4	4.5	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Security	(USDM)	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I.T.	(USDM)	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	(USDM)	74.3	2.1	7.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Closure	(USDM)	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal Capital	**(USDM)**	**219.1**	**11.9**	**20.0**	**18.3**	**8.4**	**11.7**	**14.0**	**19.5**	**7.7**	**11.9**	**12.1**
Contingency	(USDM)	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contingency Rate	(%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Capital	**(USDM)**	**219.1**	**11.9**	**20.0**	**18.3**	**8.4**	**11.7**	**14.0**	**19.5**	**7.7**	**11.9**	**12.1**
Economics, Real:												
Sales Revenue	(USDM)	3,459	30	109	141	168	184	179	182	184	206	242
Operating Costs	(USDM)	1,229	16	56	63	69	73	72	73	73	78	86
Operating Profit - EBITDA	(USDM)	2,230	14	54	78	98	111	107	110	111	128	156
Tax Liability	(USDM)	743	5	17	25	32	36	35	35	36	42	52
Capital Expenditure	(USDM)	219	12	20	18	8	12	14	20	8	12	12
Working Capital	(USDM)	0	4	1	3	2	1	0	0	0	2	3
Net Free Cash Flow	**(USDM)**	**1,268**	**-7**	**16**	**32**	**56**	**62**	**59**	**55**	**67**	**73**	**88**

Table 12-6: Base Case Mine Perspective Cash Flow Summary Years 11 to 20

Year			Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Period - Beginning	Units	Total/Ave	1-Jan-28	1-Jan-29	1-Jan-30	1-Jan-31	1-Jan-32	1-Jan-33	1-Jan-34	1-Jan-35	1-Jan-36	1-Jan-37
Production Mining												
Total Waste	**(kt)**	**71,767**	**5,007**	**4,993**	**4,993**	**4,993**	**5,007**	**139**	**0**	**0**	**0**	**0**
Total Ore	**(kt)**	**20,647**	**1,504**	**1,500**	**1,500**	**1,500**	**872**	**0**	**0**	**0**	**0**	**0**
Total Material Moved	**(kt)**	**92,415**	**6,511**	**6,493**	**6,493**	**6,493**	**5,879**	**139**	**0**	**0**	**0**	**0**
Stripping Ratio	**(t:t)**	**3.48**	**3.33**	**3.33**	**3.33**	**3.33**	**5.74**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Processing												
Total Ore Treated	**(kt)**	**21,629**	**1,504**	**1,500**	**1,500**	**1,500**	**1,504**	**350**	**0**	**0**	**0**	**0**
Total Grade	**(ct/t)**	**9.11**	**3.05**	**3.36**	**3.29**	**2.90**	**2.59**	**2.59**	**0.00**	**0.00**	**0.00**	**0.00**
Total Content	**(ct 000's)**	**197,015**	**4,585**	**5,043**	**4,937**	**4,353**	**3,901**	**907**	**0**	**0**	**0**	**0**
Carats Sales Calculated												
Total Sales	**(ct 000's)**	**202,648**	**4,628**	**4,814**	**4,990**	**4,645**	**4,127**	**2,404**	**7,832**	**0**	**0**	**0**
Premium	(ct 000's)	3,558	330	385	399	372	330	192	26	0	0	0
Ruby	(ct 000's)	19,760	1,204	1,367	1,466	1,434	1,301	762	246	0	0	0
Low Ruby	(ct 000's)	12,780	185	191	207	189	167	97	194	0	0	0
-4.6	(ct 000's)	50,717	528	543	582	536	471	274	1,353	0	0	0
Corundum	(ct 000's)	13,831	250	261	297	257	212	121	641	0	0	0
Sapphire	(ct 000's)	102,002	2,131	2,067	2,037	1,856	1,646	958	5,373	0	0	0
Commodity Prices												
Total Sales	**(USD/ct)**	**17.1**	**63.77**	**71.39**	**71.64**	**72.01**	**72.17**	**72.21**	**3.80**	**0.00**	**0.00**	**0.00**
Premium	(USD/ct)	800.0	800.00	800.00	800.00	800.00	800.00	800.00	800.00	0.00	0.00	0.00
Ruby	(USD/ct)	25.0	25.00	25.00	25.00	25.00	25.00	25.00	25.00	0.00	0.00	0.00
Low Ruby	(USD/ct)	1.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00
-4.6	(USD/ct)	2.0	2.00	2.00	2.00	2.00	2.00	2.00	2.00	0.00	0.00	0.00
Corundum	(USD/ct)	0.1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.00
Sapphire	(USD/ct)	0.0	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.00	0.00	0.00
Revenue												
Total Revenue	**(USDM)**	**3,458.8**	**295.1**	**343.6**	**357.5**	**334.5**	**297.8**	**173.6**	**29.7**	**0.0**	**0.0**	**0.0**
OPERATING COSTS, Real												
Mining and production costs	(USDM)	368.1	25.86	25.83	25.83	25.83	24.71	0.58	0.00	0.00	0.00	0.00
Administrative expenses	(USDM)	82.0	5.75	5.75	5.75	5.75	5.10	0.12	0.00	0.00	0.00	0.00
Management and auction fees	(USDM)	432.3	36.89	42.95	44.68	41.81	37.23	21.70	3.72	0.00	0.00	0.00
Mineral royalties and production taxes	(USDM)	346.4	29.55	34.40	35.78	33.48	29.81	17.39	2.97	0.00	0.00	0.00
Total Operating Costs	**(USDM)**	**1,228.9**	**98.0**	**108.9**	**112.0**	**106.9**	**96.9**	**39.8**	**6.7**	**0.0**	**0.0**	**0.0**
CAPITAL COSTS, Real												
Engineering and Mining	(USDM)	94.9	10.8	2.2	10.9	6.2	0.0	0.0	0.0	0.0	0.0	0.0
Exploration	(USDM)	10.0	0.7	0.7	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0
Wash Plant & Sort Plant	(USDM)	14.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Security	(USDM)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I.T.	(USDM)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other & Sustaining	(USDM)	74.3	5.0	5.0	5.0	5.0	5.0	0.0	0.0	0.0	0.0	0.0
Closure	(USDM)	25.0	0.0	0.0	0.0	0.0	0.0	10.0	10.0	5.0	0.0	0.0
Subtotal Capital	**(USDM)**	**219.1**	**16.5**	**7.9**	**16.6**	**11.9**	**5.7**	**10.0**	**10.0**	**5.0**	**0.0**	**0.0**
Contingency	(USDM)	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contingency Rate	(%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total Capital	**(USDM)**	**219.1**	**16.5**	**7.9**	**16.6**	**11.9**	**5.7**	**10.0**	**10.0**	**5.0**	**0.0**	**0.0**
Economics, Real:												
Sales Revenue	(USDM)	3,459	295	344	357	334	298	174	30	0	0	0
Operating Costs	(USDM)	1,229	98	109	112	107	97	40	7	0	0	0
Operating Profit - EBITDA	(USDM)	2,230	197	235	245	228	201	134	23	0	0	0
Tax Liability	(USDM)	743	68	82	85	79	69	44	0	0	0	0
Capital Expenditure	(USDM)	219	17	8	17	12	6	10	10	5	0	0
Working Capital	(USDM)	0	5	4	1	-2	-3	-6	-13	-3	0	0
Net Free Cash Flow	**(USDM)**	**1,268**	**108**	**140**	**142**	**139**	**129**	**86**	**26**	**-2**	**0**	**0**

12.6.2 Net Present Value

Net present values of the cash flows are shown in Table 12-7 using discount rates from 8% to 12% in a post-tax context. The CP notes that for the Base Case from a Mine perspective, at a 10% discount rate, the post-tax NPV is USD527 M.

Table 12-7: NPV Profiles at Various Discount Rates

Summary of NPV's		Mine Perspective
	Discount Rate	NPV USDm
Net Present Value	8.0%	617
	10.0%	527
	12.0%	454

12.6.3 Base Case Mine perspective Sensitivity Analysis

General Sensitivity

Figure 12-2 shows a Base Case Mine perspective NPV sensitivity chart for Mine operating costs; capital expenditure and revenue. The Mine's NPV is most sensitive to revenue (grade or commodity price) as illustrated by the blue line in Figure 12-2. The Mine has lower sensitivity to operating costs and is least sensitive to capital as indicated by the red line and the much flatter green line in Figure 12-2. The operating and capital cost sensitivity is further illustrated in Table 12-8.

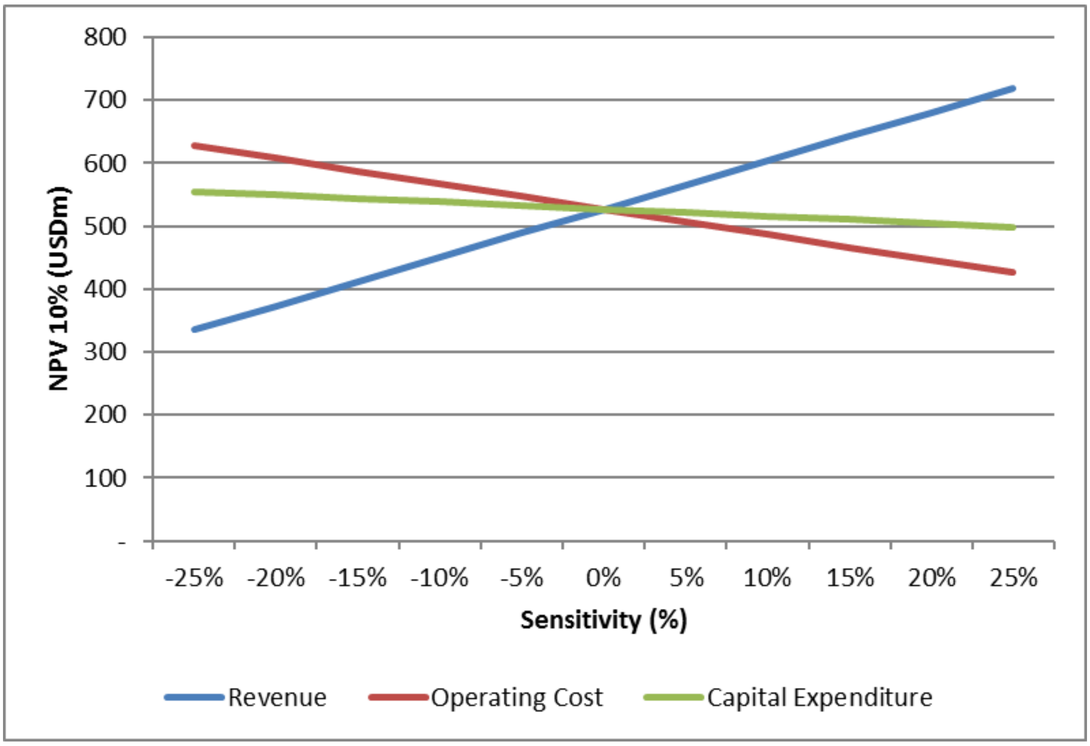

Figure 12-2: Base Case Mine Perspective Sensitivity Analysis

Table 12-8: Base Case Mine Perspective Sensitivity Analysis for NPV at 10%

NPV 10% (USDm)		REVENUE SENSITIVITY				
		-20%	-10%	0%	10%	20%
OPEX SENSITIVITY	-20%	445	527	608	690	772
	-10%	409	488	568	647	726
	0%	373	450	527	604	681
	10%	338	412	487	561	636
	20%	302	374	446	518	590

NPV 10% (USDm)		REVENUE SENSITIVITY				
		-20%	-10%	0%	10%	20%
CAPEX SENSITIVITY	-20%	396	473	550	627	703
	-10%	385	461	538	615	692
	0%	373	450	527	604	681
	10%	362	439	516	593	670
	20%	351	428	505	582	658

NPV 10% (USDm)		OPEX SENSITIVITY				
		-20%	-10%	0%	10%	20%
CAPEX SENSITIVITY	-20%	631	590	550	509	469
	-10%	619	579	538	498	457
	0%	608	568	527	487	446
	10%	597	556	516	475	435
	20%	586	545	505	464	424

Sensitivity to Premium Ruby Content at Mugloto Pit

The Base Case NPV sensitivity to the "Premium Ruby" content from the Mugloto pit is a key value driver and is illustrated in Table 12-9.

Table 12-9: Sensitivity to Premium Ruby Content in Mugloto Pit on Base Case NPV

% Premium Content	NPV@10% USDM
1%	67
2%	134
3%	197
4%	263
5%	329
6%	395
7%	461
8%	527
9%	579
Uncapped	593

Sensitivity to Resource/Reserve Grade

The Base Case NPV sensitivity to the overall Reserve grade is illustrated in Table 12-13.

Table 12-10: Sensitivity to Reserve Grade on Base Case NPV

Grade Sensitivity	Average Reserve Grade (ct/t)	NPV@10% (USDM)
25%	11.4	718
20%	10.9	680
15%	10.5	642
10%	10.0	604
5%	9.6	565
0%	9.1	527
-5%	8.7	489
-10%	8.2	451
-15%	7.7	412
-20%	7.3	374
-25%	6.8	336

Sensitivity to Reduced Sales

The CP notes that there is a significant increase in sales volumes in the LoMp, particularly regarding the lower quality products. Discussion on future sales increase and marketing strategy supporting this is contained in Sections 10.9 and 10.11 of this CPR. Further, it is noted that the distribution of revenue is heavily weighted to the two main products Premium and Ruby representing 82.3% and 14.3% of total revenue respectively over the LoM. The 4 lower quality products share of revenue is less than 4% as shown in Table 12-11. However, to demonstrate the sensitivity of NPV to reduced sales volumes of the lower quality products a cap on annual sales of each of the lower quality products has been applied with impact on NPV shown in Table 12-12.

The impact of reduced sales volume of the primary product is implied in Table 12-9 above. However, for completeness the impact on the Base Case NPV by capping sales of premium and ruby products has also been assessed and is presented in Table 12-13 and Table 12-14.

Table 12-11: LoM Revenue Split by Product

Product	(%)
Premium	82.3%
Ruby	14.3%
Low Ruby	0.4%
-4.6	2.9%
Corundum	0.04%
Sapphire	0.09%

Table 12-12: Sensitivity To Sales - Low Ruby, -4.6, Corundum and Sapphire Products on Base Case NPV

Low Ruby & -4.6, Corundum & Sapphire Sales Cap for each product (ct 000's/year)	NPV@10% (USDM)
Uncapped	527
5,000	521
4,000	520
3,000	518
2,000	515
1,000	508

Table 12-13: Sensitivity To Sales - Premium Product

Premium Sales Cap (ct 000's/year)	NPV@10% (USDM)
Uncapped	527
300	516
250	502
200	479
150	426
100	296

Table 12-14: Sensitivity To Sales - Ruby Product

Ruby Sales Cap (ct 000's/year)	NPV@10% (USDM)
Uncapped	527
5,000	524
4,000	518
3,000	508
2,000	494
1,000	471

12.6.4 Payback Period

The Mine is a going concern, there is a small initial negative cash flow in year 1 with positive cashflows from thereafter, details are illustrated in Figure 12-1.

12.6.5 Breakeven Points

Analysis undertaken in the financial model indicates that based on the current LoMp and its underlying assumptions the Mine breaks even ($NPV_{10\%}$ =0) at an average price of USD5.41 /ct or an average grade of 2.83 ct/t.

12.7 Previous Valuation

SRK authored a CPR on MRM in 2015 (A Competent Persons Report on The Montepuez Ruby Project, Mozambique, July 2015). A comparison of key parameters between the 2015 CPR and this 2018 updated CPR is presented in Table 12-15. A key change to the 2018 CPR has been the reduced tonnage and grade but improved level of confidence with the updated Mineral Resource estimate.

- Total ore treated over the LoM has decreased from 27.5 Mt to 20.6 Mt due to changes in the way the Mineral Resource has been treated for classification.
- Average LoM grade has reduced to 9.1 ct/t from 15.7 ct/t due to a decrease in the proportion of high incidence Maninge nice ore.
- Capital costs have decreased because of the reduced LoM with lower provision of ongoing replacement of the mining fleet and sustaining capital.
- Unit production and admin operating costs are lower being based on actual historical costs for the 2018 CPR. Key changes to operating costs include the adoption of in-pit backfill reducing haulage distances and the removal of contractors for waste haulage. Also the previous cost estimate was conservatively derived on an assumed stripping ratio of 3.8.
- In the 2018 CPR management and auction fees have been based on the mine perspective at a total of 12.5% of MRM revenue. In the 2015 CPR the Gemfields Group perspective was assumed at 1.75% of MRM revenue.

Table 12-15: Comparison of Key Parameters Between the 2015 and 2018 CPRs

		2018 CPR (SAMREC)	2015 CPR (JORC)
Total area*	Sq km	77	36
No of domains*		8	2
No of domains with production data*		4	2
Total Mineral Resource*	(Mt)	60.2	27.5**
Mineral reserve*	(Mt)	20.6	27.5
NPV@10%	(USDM)	527	996
Cash Flow			
Sales Revenue	(USDM)	3,459	5,959
Operating Costs	(USDM)	1,229	1,417
Operating Profit - EBITDA	**(USDM)**	**2,230**	**4,542**
Tax Liability	(USDM)	743	1,478
Capital Expenditure	(USDM)	219	305
Net Free Cash Flow	**(USDM)**	**1,268**	**2,757**
Production			
Total Waste Mined	(kt)	71,767	87,939
Total Ore Mined	(kt)	20,647	27,196
S/R	(kt)	3.48	3.23
Total Ore Treated	(kt)	21,629	27,549
Grade	(ct/t)	9.1	15.7
Contained Ct	(ct 000's)	197,015	431,620
Stock Inventory	(ct 000's)	5,633	3,429
Total Sales	(ct 000's)	202,648	435,049
Operating Costs			
Mining and production costs	(USD/t Treated)	17.02	27.07
Administrative expenses	(USD/t Treated)	3.79	7.59
Management and auction fees	(USD/t Treated)	19.99	3.79
Mineral royalties and production taxes	(USD/t Treated)	16.02	13.01
Total Operating Costs	(USD/t Treated)	56.81	51.45

* Please see figure 4-11, 4-16 and 5-1

** The 2015 Mineral Resource of 27.5Mt has been adjusted to include dilution on the same basis as the 2018 estimate.

12.8 Conclusions

Based on the work carried out for this CPR, the CP concludes the following:

- The review work by the CV indicates that the Intrinsic Value as determined by an income-based approach for the Mineral Reserves of the Montepuez Ruby Mine Base Case is an NPV of USD527 M at a discount rate of 10%.
- The Mine has favourable economics and based on the assumed commodity prices is considered robust in terms of the estimated operating margins and return on investment.
- The total capital expenditure is estimated to be USD219 M over the LoM. Capital for engineering and mining has been estimated at USD95 M and the wash plant at USD14 M. Ongoing exploration capital is estimated at USD10 M. Sustaining capital for the on-going operations is estimated to be USD744 M. Closure costs are estimated at USD25 M.
- Average operating costs for the Mine at a mine perspective level have been estimated to be USD56.81 /t treated.

- The Mine's NPV is most sensitive to revenue (grade or commodity price); however, the overall economics of the Montepuez Ruby Mine are considered to be robust.

12.9 Recommendations

Based on the work carried out for this CPR, the CP recommends the following:

- further refinement of capital cost estimates is undertaken in order to optimise Mine profitability; and
- the financial model is updated regularly to reflect new information relating to revised mine plans, resource estimates and prices realised at auctions.

12.10 Sources of Information

This valuation was prepared as part of this CPR. All information used in undertaking the valuation has been derived by the CP's and key technical staff responsible for preparing the CPR.

Historical information on MRM's production and costs was provided by the mine and collated on the site visits by SRK staff.

The LoM production plan was prepared by SRK. Forecast operating costs and capital costs including closure costs were prepared by the mine and collated by SRK staff. This has been reviewed and adjusted where appropriate by the SRK team.

The key files referenced in producing the TEM are:

- Mine and production schedule and costs and mining capital - MRM Production Budget Summary_SRK181024.xlsx – Source Hanno Buys of SRK
- Other capital costs - 20170918_MRM_Financial data for SRK Review.xlsx - Source MRM collated by Hanno Buys of SRK from site visit
- Opening Balance for Stock inventory – Production SH July – Dec 17 SRK.xlsx - Source Gemfields Kartikeya Parikshya
- Historical Auction Prices - Auction Split by CY updated 2018.xlsx– Source Gemfields Kartikeya Parikshya

13 REFERENCES

The following list of key documents and files have been referenced in preparing this CPR:

- A Competent Persons Report on The Montepuez Ruby Project, Mozambique, July 2015, authored by SRK
- Regional and Semi Detailed Photo Interpretation Report, GaiaPix, February 2013
- Ruby Montepuez Mozambique Report, GIA, October 2013
- Characterisation and Beneficiation Studies Draft Report, CSIA, February 2014
- Geology Final Report on Maninge Nice,, P. Allan September 2013
- Scoping Testwork on a Mozambique Ruby Deposit, Mintek, July 2013

- Variuos Geological Maps – GeoEye, March 2015
- Montepuez Ruby Draft Report.pdf – Mintek testwork report
- 10866 - 535 - Duo Africa - Scrubbing Report.pdf – SGS
- 20150304 MRM - Tomra - Rest Report.pdf – Tomra
- Gemfields test report.pdf - Tomra
- United Nations Commodity Trade Report 2016
- United Nations Commodity Trade Statistics Database
- 2015 United Nations Commodity Survey
- The Gem Guide'
- Auction Split by CY updated 2018.xlsx – Source Gemfields
- Sort House Inventory Count 30 June 2017-31 December2018-31August2018 V2.xlsx – Source Gemfields
- 2018 YTD 2018.03.20_MRM_Historical Operating Costs_for SRK received v2.xlsx – Source Gemfields
- http://www.eia.nl/en/countries/af/mozambique/eia (accessed 25 October 2017 – site updated 8 May 2017)
- http://www.samcode.co.za/samcode-ssc/samval (accessed 25 October 2017 – specifically the SAM ESG Guideline)
- Mine and production schedule and costs and mining capital - MRM Production Budget Summary_SRK181024.xlsx – Source Hanno Buys of SRK
- Other capital costs - 20170918_MRM_Financial data for SRK Review.xlsx - Source MRM collated by Hanno Buys of SRK from site visit
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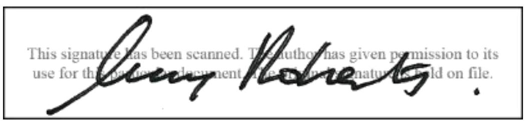
- Historical Auction Prices - Auction Split by CY updated 2018.xlsx– Source Gemfields Kartikeya Parikshya

For and on behalf of SRK Consulting (UK) Limited



Dr Lucy Roberts,
Principal Consultant
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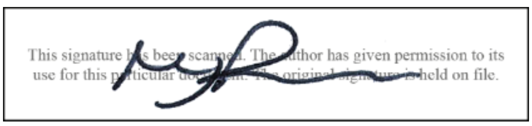

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APPENDIX

A JSE COMPLIANCE CHECKLIST

MRM JSE COMPLIANCE CHECKLIST

Chapter 12 of JSE Listing Rules		SAMREC ("SR") Code		SAMVAL ("SV") Code	
Section	**Where complied with**	**Section**	**Where complied with**	**Section**	**Where complied with**
12.8(a)	This Report	SR1.1	Section 1.2, Section 1.5	SV1.0	Section 12.1 and Appendix C
12.8(b)	Section 1.6.3	SR1.2	Section 1.2.1	SV1.1	Part of full CPR
12.8(c)	Financial information with respect to Pallinghurst is available on their website at www.pallinghurst.com	SR1.3	Not Relevant – neighboring properties do not have an important bearing on the project or CPR	SV1.2	Part of full CPR – Executive summary, Section 12.1 and 12.2
12.8(d)	Section 1.5.3	SR1.4	Section 1.2.5	SV1.3	Section 1.1 and Section 12.1
12.8(e)	Section 3.2, Section 1.5.3, Section 9.3.9	SR1.5	Section 3.2, Section 1.5.3, Section 9.3.9	SV1.4	Section 1.3.3
12.9(a)	Section 1.4	SR1.6	Section 12.1	SV1.5	Section 1.2 and Section 1.5.3
12.9(b)	Not applicable	SR1.7	Section 9.6	SV1.6	Section 1.2.5
12.9(c)	Section 1.6.3	SR2.1	Section 2, Section 4.1	SV1.7	Section 2
12.9(d)	This table, below section headings	SR3.1	Section 3, Section 2, Section 4	SV1.8	Section 3
12.9(e)	Section 1.3.3 –	SR3.2	Section 3.7and 3.9	SV1.9	Section 4.4 and Section 5.7.4
12.9(e)(i)-(iii)	Section 3	SR3.3	Section 3.	SV1.10	Section 12.3
12.9(f)	Section 12	SR3.4	Not relevant – ruby / corundum grades are derived from processing and production figures from the mine	SV1.11	Section 12.7
12.9(g)	To be published in full on website	SR3.5	Section 3.	SV1.12	Section 12.2
12.9(h)	Set out below	SR3.6	Section 3.	SV1.13	Section 12.1
12.9(h)(i)	Section 1.1	SR3.7	Section 3.10, Section 4.5.3	SV1.14	Section 12.6 Section 12.8
12.9(h)(ii)	Section 1.2	SR3.8	Section 3, Section 4 and Section 5	SV1.15	Section 12-6 Section 12.1 Section 11
12.9(h)(iii)	Section 1.2, Figures 1-1 and 1-2	SR4.1	Section 2 and section 4	SV1.16	Not applicable no ICA valuations
12.9(h)(iv)	Section 3.2, Section 1.5.3, Section 9.3.9	SR4.2	Section 4 Section 5.7.2	SV1.17	Section 5.2
12.9(h)(v)	Section 2	SR4.3	Section 4, Section 5.3.1, Section 5.4, Section 5.7.3, Section 8.9, This Report	SV1.18	Section 10
12.9(h)(vi)	Section 3	SR4.4	Section 4.7	SV1.19	Section 12.9
12.9(h)(vii)	Section 5.7.2	SR4.5	Section 4, Section 5, section 5.7.4		
12.9(h)(viii)	Section 9.7	SR5.1	Section 5.7.4, Section 5.7.2		
12.9(h)(ix)	Section 4.4, Section 5.7.4	SR5.2	Section 5.7.2, Section 5.3, Section 5.6, Section 5.4		
12.9(h)(x)	Section 11	SR5.3	Section 7.2		
12.9(h)(xi)	Section 1.1	SR5.4	Section 8		
12.9(h)(xii)	Table 12-9	SR5.5	Section 9		
12.10(a)	Section 1.3.3, Section 1.6.3, Section 4.4, Section 5.7.4	SR5.6	Section 10		
12.10(b)	Not applicable	SR5.7	Section 11		
		SR5.8	Section 12		
		SR6.1	Section 5.7		
		SR6.2	Section 5.7.4		
		SR6.3	Section 5.7.4, Section 5.3.4, Section 5.7,		
		SR7.1	Not applicable		
		SR8.1	Not applicable		
		SR9.1	Section 4.4, Section 5.7.4 –		
		SR10	Not applicable		
		SR11.1	Section 2		
		SR11.2	Section 3.4, Section 3.5, Section 3.6, Section 3.7, Section 3.8, Section 3.9 and Section 3.10 Section 7		
		SR11.3	Not relevant		
		SR11.4	Section 4.1, Section 4.2, Section 3, Section 5, Section 10 and Section 12		
		SR11.5	Section 4.3, Section 4.4 Section 5.7		
		SR11.6	Section 3, Section 10 and Section 7		
		SR12.1	Not applicable		
		SR13.1	Not applicable		

APPENDIX

B SAMREC TABLE 1 & SAMVAL TABLE 1

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<table>
<tr><th colspan="6">SAMREC TABLE 1</th></tr>
<tr><th colspan="3"></th><th>Exploration Results</th><th>Mineral Resources</th><th>Mineral Reserves</th></tr>
<tr><th colspan="6">Section 1: Project Outline</th></tr>
<tr><td rowspan="3">1.1</td><td rowspan="3">Property Description</td><td>(i)</td><td colspan="3">Brief description of the scope of project (i.e. whether in preliminary sampling, advanced exploration, scoping, pre-feasibility, or feasibility phase, Life of Mine plan for an ongoing mining operation or closure). Section 1.2</td></tr>
<tr><td>(ii)</td><td colspan="3">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. Section 1.2</td></tr>
<tr><td>(iii)</td><td colspan="3">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. Section 1.5</td></tr>
<tr><td rowspan="3">1.2</td><td rowspan="3">Location</td><td>(i)</td><td colspan="3">Description of location and map (country, province, and closest town/city, coordinate systems and ranges, etc.). Section 1.2</td></tr>
<tr><td>(ii)</td><td colspan="3">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. Section 1.2</td></tr>
<tr><td>(iii)</td><td>Provide a general topocadastral map Section 1.2</td><td>Provide a Topo-cadastral map in sufficient detail to support the assessment of eventual economics. State the known associated climatic risks.</td><td>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.</td></tr>
<tr><td>1.3</td><td>Adjacent Properties</td><td>(i)</td><td colspan="3">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. Not Relevant – neighboring properties do not have an important bearing on the project or CPR</td></tr>
<tr><td>1.4</td><td>History</td><td>(i)</td><td colspan="3">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. Section 1.2</td></tr>
</table>

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SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 1: Project Outline					
1.4	History	(ii)	Present details of previous successes or failures with reasons why the project may now be considered potentially economic. Not Relevant no previous failures are known		
		(iii)		Discuss known or existing historical Mineral Resource estimates and performance statistics on actual production for past and current operations. Section 4.9	
		(iv)			Discuss known or existing historical Mineral Reserve estimates and performance statistics on actual production for past and current operations.
1.5	Legal Aspects and Permitting		Confirm the legal tenure to the satisfaction of the Competent Person, including a description of the following: Section 3.2, Section 1.5.3, Section 9.3.9		
		(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.		
		(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).		
		(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.		
		(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.		
		(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.		
1.6	Royalties	(i)	Describe the royalties that are payable in respect of each property. Section 12.1		

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SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 1: Project Outline					
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. Section 9.6		

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 2: Geological Setting, Deposit, Mineralisation					
2.1	Geological Setting, Deposit, Mineralisation	(i)	Describe the regional geology. (Section 2.1)		
		(ii)	Describe the project geology including deposit type, geological setting and style of mineralisation. (Section 2.2)		
		(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. (Section 2.2)		
		(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. (Section 3)		
		(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. . (Section 2.2.4)		
		(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 mineralization. (Section 2.2)		
		(vii)	Confirm that reliable geological models and / or maps and cross sections that support interpretations exist. (Section 2.2 and Section 4.1)		

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SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 3: Exploration and Drilling, Sampling Techniques and Data					
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. (Section 3)		
		(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. (Section 3)		
		(iii)	Acknowledge and appraise data from other parties and reference all data and information used from other sources. (Not relevant – all exploration reported in the CPR has been conducted by Gemfields or their subsidiaries)		
		(iv)	Clearly distinguish between data / information from the property under discussion and that derived from surrounding properties (Not relevant – no data from surrounding properties is presented or discussed)		
		(v)	Describe the survey methods, techniques and expected accuracies of data. Specify the grid system used. (Section 3)		
		(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. (Section 4.7.4)		
		(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 (Section 2.2 and Section 4.1)		
		(viii)	Report the relationships between mineralisation widths and intercept lengths. The geometry of the mineralisation with respect to the drill hole angle is particularly important. 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'). (Section 4)		
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). (Section 3.7)		

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SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 3: Exploration and Drilling, Sampling Techniques and Data					
3.2	Drilling Techniques	(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. (Section 3.9)		
		(iii)	Describe whether logging is qualitative or quantitative in nature; indicate if core photography. (or costean, channel, etc) was undertaken (Section 3.9)		
		(iv)	Present the total length and percentage of the relevant intersections logged. (Section 3)		
		(v)	Results of any downhole surveys of the drill hole to be discussed. (Section 3.7.4)		
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. (Section 3)		
		(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. (Section 3)		
		(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 (Section 3)		
		(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. (Section 3)		
		(v)	Describe retention policy and storage of physical samples (e.g. core, sample reject, etc.) (Section 3)		
		(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. (Section 3)		

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SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 3: Exploration and Drilling, Sampling Techniques and Data					
3.3	Sample method, collection, capture and storage	(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. (Section 3)		
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. (Not relevant – ruby / corundum grades are derived from processing and production figures from the mine)		
		(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. (Not relevant – ruby / corundum grades are derived from processing and production figures from the mine)		
		(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.) (Not relevant - – ruby / corundum grades are derived from processing and production figures from the mine)		
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. (Section 3)		
		(ii)	Describe the measures taken to ensure sample security and the Chain of Custody. (Section 3)		
		(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.) (Section 3)		
		(iv)	Describe the audit process and frequency (including dates of these audits) and disclose any material risks identified. (Not relevant – ruby / corundum grades are derived from processing and production figures from the mine)		
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. (Section 3)		

SAMREC TABLE 1				
		Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 3: Exploration and Drilling, Sampling Techniques and Data				
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. (Section 3.10)	
		(ii)	If target tonnage ranges are reported state the preliminary estimates or basis of assumptions made for bulk density. (Section 3.10 and Section 4.5.3)	
		(iii)	Discuss the representivity of bulk density samples of the material for which a grade range is reported. (Section 3.10 and Section 4.5.3)	
		(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. (Section 3.10 and Section 4.5.3)	
3.8	Bulk-Sampling and/or trial-mining	(i)	Indicate the location of individual samples (including map). (Section 3 and Section 4)	
		(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. (Section 3 and Section 4)	
		(iii)	Describe the method of mining and treatment. (Section 5)	
		(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. Sections 3, 4, and 5)	

SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 4: Estimation and Reporting of Exploration Results and Mineral Resources					
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. (Section 4)		
		(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. (Section 2 and 4)		
		(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. (Not relevant – no Exploration Results or Targets are specifically reported. Exploration completed to date has led to the declaration of Mineral Resources)		
		(iv)		Discuss all known geological data that could materially influence the estimated quantity and quality of the Mineral Resource. (Section 4)	
		(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. (Section 4)	
		(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). (Section 4)	
4.2	Estimation and modelling techniques	(i)	Describe in detail the estimation techniques and assumptions used to determine the grade and tonnage ranges. (Not relevant - no Exploration Results or Targets are specifically reported.)		

SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 4: Estimation and Reporting of Exploration Results and Mineral Resources					
4.2	Estimation and modelling techniques	(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. (Section 4 and Section 5.7.2 Modifying factors)	
		(iii)		Describe assumptions and justification of correlations made between variables. (Not relevant – no correlations between variables are presented. Grades used for the basis of reporting are derived from production data achieved to date)	
		(iv)		Provide details of any relevant specialized computer program (software) used, with the version number, together with the estimation parameters used. (Section 4)	
		(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. (Section 4)	
		(vi)		Describe the assumptions made regarding the estimation of any co-products, by-products or deleterious elements. (Not relevant – no co-products, bi-products, or deleterious elements are estimated, or relevant to the reporting of the Mineral Resource)	
4.3	Reasonable and realistic 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. (Section 4)	
		(ii)		Disclose and discuss the engineering parameters. These would include mining method, dilution, processing, geotechnical, geohydraulic and metallurgical) parameters. (Section 5.3.1 Dilution calculation)	
		(iii)		Disclose and discuss the infrastructure, including, but not limited to, power, water, site-access. (Section 8.9 Utilities)	
		(iv)		Disclose and discuss the legal, governmental, permitting, statutory parameters. Section 9.3	
		(v)		Disclose and discuss the environmental and social (or community) parameters. Section 9	

		(vi)		Disclose and discuss the marketing parameters. (Section 5.4 Economic potential)

SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 4: Estimation and Reporting of Exploration Results and Mineral Resources					
4.3	Reasonable and realistic prospects for eventual economic extraction	(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 (Section 5.4 Economic potential and Section 5.7.3 – Ruby Prices)	
		(viii)		Discuss any material risks . (Section 4)	
		(ix)		Discuss the parameters used to support the concept of "eventual" . (Section 4)	
4.4	Classification Criteria	(i)		Describe criteria and methods used as the basis for the classification of the Mineral Resources into varying confidence categories. . (Section 4.7)	
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. (Section 4)		
		(ii)	Discuss whether the reported grades are regional averages or if they are selected individual samples taken from the property under discussion. (Section 4)		
		(iii)	State assumptions regarding mining methods, infrastructure, metallurgy, environmental and social parameters. State and discuss where no mining related assumptions have been made. (Section 5)		
		(iv)	State the specific quantities and grades / qualities which are being reported in ranges and/or widths, and explain the basis of the reporting (Section 4)		
		(v)		Present the detail for example open pit, underground, residue stockpile, remnants, tailings, and existing pillars or other sources in the Mineral Resource statement (Section 4)	

SAMREC TABLE 1						
			Exploration Results	Mineral Resources	Mineral Reserves
Section 4: Estimation and Reporting of Exploration Results and Mineral Resources					
4.5	Reporting	(vi)		Present a reconciliation with any previous Mineral Resource estimates. Where appropriate, report and comment on any historic trends (e.g. global bias). (Section 4)	
		(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. (Section 5.7.4 Reserve statement)	
		(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 relevant – no CP listed is relying on any other expert)		
		(ix)	State the basis of equivalent metal formulae, if applied. (Not relevant – no metal equivalent formulae are used in the declaration of the Mineral Resource or Mineral Reserve)		

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SAMREC TABLE 1						
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 5: Technical Studies					
5.1	Introduction	(i)	Technical Studies are not applicable to Exploration Results	State the level of study – whether scoping, prefeasibility, feasibility or ongoing Life of Mine (Section 5) The level of study is based on the ongoing LoMp	State the level of study – whether prefeasibility, feasibility or ongoing Life of Mine. 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. (Section 5.7.1, Section 5.7.4 Reserve Statement)
		(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 life-of-mine studies. (Section 5.7.2 Modifying factors)
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. (Section 5)	

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 5: Technical Studies					
5.2	Mining Design	(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. (Section 5.7.2 Modifying factors)
		(iii)			State what mineral resource models have been used in the study. (Section 4)
		(iv)			Explain the basis of (the adopted) cut-off grade(s) or quality parameters applied. Include metal equivalents if relevant (Section 5.7)
		(v)			Description and justification of mining method(s) to be used. (Section 5.3 Mine design and method)
		(vi)			For open-pit mines, include a discussion of pit slopes, slope stability, and strip ratio. (Section 5.3 Mine design and method)

		(vii)			For underground mines, discussion of mining method, geotechnical considerations, mine design characteristics, and ventilation/cooling requirements. (Not relevant – no underground mining is envisaged at this time)

SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 5: Technical Studies					
5.2	Mining Design	(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. (Section 5.6 Equipment selection)
		(ix)			State the optimisation methods used in planning, list of constraints (practicality, plant, access, exposed Mineral Reserves, stripped Mineral Reserves, bottlenecks, draw control). (Section 5.4 Economic potential)
5.3	Metallurgical and Testwork Section 7.2	(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.
		(ii)			Explain the basis for assumptions or predictions regarding metallurgical amenability and any preliminary mineralogical test work already carried out.
		(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.

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 5: Technical Studies					
5.3	Metallurgical and Testwork	(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.
		(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.
		(vi)			State whether the metallurgical process is well-tested technology or novel in nature.
5.4	Infrastructure Section 8	(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	

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SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 5: Technical Studies					
5.4	Infrastructure	(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. (Section 8 Infrastructure)
		(iii)			Statement showing that all necessary logistics have been considered. (Section 8.5 Logistics and Stores)
5.5	Environmental and Social Section 9	(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	
		(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	
		(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.	
		(iv)		Identify any legislated social management programmes that may be required and discuss the content and status of these.	
		(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.	

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 5: Technical Studies					
5.6	Market Studies and Economic criteria Section 10	(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.
		(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.
		(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.
		(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.

SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 5: Technical Studies					
5.6	Market Studies and Economic criteria Section 10	(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.
		(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.
		(vii)			Provide details of allowances made for royalties payable, both to Government and private.
		(viii)			State type, extent and condition of plant and equipment that is significant to the existing operation(s).
		(ix)			Provide details of all environmental, social and labour costs considered
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. Section 11	

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 5: Technical Studies					
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 Life-of Mine), provide an economic analysis for the project that includes: Section12	
		(ii)		Cash Flow forecast on an annual basis using Mineral Reserves or an annual production schedule for the life of the project - Section12	
		(iii)		A discussion of net present value (NPV), internal rate of return (IRR) and payback period of capital - Section12	
		(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.- Section12	

<table>
<tr><th colspan="6">SAMREC TABLE 1</th></tr>
<tr><th colspan="3"></th><th>Exploration Results</th><th>Mineral Resources</th><th>Mineral Reserves</th></tr>
<tr><th colspan="6">Section 6: Estimation and Reporting of Mineral Reserves</th></tr>
<tr><td rowspan="3">6.1</td><td rowspan="3">Estimation and modelling techniques</td><td>(i)</td><td></td><td colspan="2">Describe the Mineral Resource estimate used as a basis for the conversion to a Mineral Reserve. (Section 4)</td></tr>
<tr><td>(ii)</td><td></td><td colspan="2">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. (Section 5.7 Reserves)</td></tr>
<tr><td>(iii)</td><td></td><td></td><td>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)</td></tr>
<tr><td>6.2</td><td>Classification Criteria</td><td>(i)</td><td></td><td></td><td>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. (Section 5.7.4 Ore reserve statement)</td></tr>
<tr><td>6.3</td><td>Reporting</td><td>(i)</td><td></td><td></td><td>Discuss the proportion of Probable Mineral Reserves, which have been derived from Measured Mineral Resources (if any), including the reason(s) therefore. (Section 5.7.4 Reserve statement)</td></tr>
</table>

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 6: Estimation and Reporting of Mineral Reserves					
6.3	Reporting	(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. (Section 5.3.4 Ore stockpiles)
		(iii)			Present the details of the defined reference point for the Mineral Reserves. State whether 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. (Section 5.7 Reserves)
		(iv)			Present a reconciliation with the previous Mineral Reserve estimates. Where appropriate, report and comment on any historic trends (e.g. global bias). (Section 5.7 Reserves)
		(v)			Only Measured and Indicated Mineral Resources can be considered for inclusion in the Mineral Reserve. (Section 5.7 Reserves)
		(vi)			State whether the Mineral Resources are inclusive or exclusive of Mineral Reserves.

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SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 7: Audits and Reviews					
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. Not Applicable		
		(ii)	Disclose the conclusions of relevant audits or reviews. Note where significant deficiencies and remedial actions are required. Not Applicable		
Section 8: Other Relevant Information					
8.1		(i)	Discuss all other relevant and material information not discussed elsewhere.		
Section 9: Qualification of Competent Person(s) and other key technical staff. Date and Signature Page					
9.1		(i)	State the full name, registration number and name of the professional body or RPO, for all the Competent Person(s). State the relevant experience of the Competent Person(s) and other key technical staff who prepared and are responsible for the Public Report. (Section 4 and 5 and appendix C)		
		(ii)	State the Competent Person's relationship to the issuer of the report. (Section 4 and 5 and appendix C)		
		(iii)	Provide the Certificate of the Competent Person (Appendix 2), including the date of sign-off and the effective date, in the Public Report (Section 1.4 and Appendix C)		

SAMREC TABLE 1			
	Exploration Results	Mineral Resources	Mineral Reserves
Section 11: Reporting of Diamonds and Gemstones			
This section highlights criteria that are applicable to diamond deposits and to other gemstone deposits. Reports of diamond and other gemstone properties must also take cognisance of sections 59-71 of the Code, Sections 1 - 9 of Table 1 and the Guidance notes in the SAMCODE Companion Volume. The information required in this section (Section 11) should be included with the relevant sections and should not comprise a separate chapter.			
11.1	Geological Setting, Deposit, Mineralisation	(i)	For diamond placer occurrences, describe the overburden and gravel thicknesses, as well as bedrock topography (Sections 2, 3, and 4)
11.2	Sampling of Diamond Projects	(i)	Describe the type of sample (outcrop, boulder, drill-core, RC drill cuttings, gravel, stream sediment or soil) and purpose (for example: RC drilling to identify gravel thickness, large diameter drilling to establish stones per unit of volume, bulk-sample, etc.) (Section 3)
		(ii)	Discuss sample size, distribution and representivity (Section 3)
		(iii)	Identify the type of sample facility, treatment rate and accreditation (Not relevant – ruby / corundum grades used for the basis of grade estimation are derived from production at the mine)
		(iv)	Discuss sample size reduction, bottom and top screen sizes and any re-crush (Section 3 and Section 7)
		(v)	Discuss the sample processes (e.g. DMS, grease, X-Ray, Hand-sorting, etc.) (Section 3)
		(vi)	Discuss process efficiency, tailings auditing and granulometry (Section 7)
		(vii)	Identify the laboratory used, type of process for microdiamonds and accreditation. Reports of microdiamond recoveries should describe the extraction process, crushing methodology and the stone counts per unit weight, as a minimum. (Not relevant – ruby / corundum grades used for the basis of grade estimation are derived from production at the mine)
		(viii)	State whether the reports of kimberlitic indicator minerals ("KIM's") or diamond indicator minerals ("DIM's") have been prepared by a suitably qualified laboratory which must be identified. (Not relevant – ruby / corundum grades used for the basis of grade estimation are derived from production at the mine. Furthermore, no KIM or DIM reports have been presented, as these are not relevant to the mineralization style)
		(ix)	Supply details of the sampling parameters for reports dealing with recoveries of diamonds or KIM's, including, but not limited to type of sample (stream sediment, soil, bulk, rock, etc.) as well as sample size, sample frequency, representivity and screen parameters are required. (Not relevant - – ruby / corundum grades used for the basis of grade estimation are derived from production at the mine, and

			some of these aspects are not relevant to the mineralization style)

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 11: Reporting of Diamonds and Gemstones					
11.2	Sampling of Diamond Projects	(x)	Discuss the relevant major and trace element chemistry of any kimberlitic indicator minerals recovered. Reference relevant peer-reviewed published research articles when reporting the interpretation of mineral chemistry data for diamond exploration projects. (Not relevant to the style of mineralisation)		
		(xi)	Provide details of the form, shape, colour and size of the diamonds recovered and, where relevant, comments regarding the nature of the source of the diamonds. (Section 2)		
11.3	Bulk-Sampling and/or trial-mining	(i)	Provide a table of relevant results, including (but not limited to) volume of sample, number of individual diamonds, total number of carats, sample grade, diamond value (it is not possible to evaluate diamond assortment from microdiamonds). (Sections 4 and 5 – Production results reported)		
		(ii)	Discuss micro- and macro- diamond sample results per geological domain. (Not relevant to the style of mineralisation)		
		(iii)	Discuss stone-size and -number distribution (Size-frequency distribution). Include the suitability of the sample size to the stage of the project and its relevance for both SFD and valuation (assortment) purposes. (Sections 3.8 and 4 discusses the systems used to record the gemstones recovered. A size frequency distribution has not been generated as it is not considered to be relevant to the style of mineralization, although information is presented on the stone qualities and and carats produced during the operation of the mine)		
		(iv)	State the top and bottom sieve cut-off sizes. (Section 3.8, Section 4 (especially Section 4.4), and Section 7)		
		(v)	Discuss diamond breakage, where relevant (Not relevant to the style of mineralization, although some comments regarding stone breakage are included in Section 7)		
		(vi)	Define the unit of grade measure used in the document (e.g. carat per units of mass, area or volume). Where carats per unit of mass is used, include a discussion of mass to tonnage conversion. (Sections 3 and 4 – grades are presented as carats / tonne, with density factors presented)		
11.4	Estimation and Modelling Techniques	(i)	Describe in detail any estimation techniques (including geostatistical estimation, where relevant) used to determine the volume/tonnage, grade and value data, including their applicability to the deposit type. (Not relevant – geostatistical methods were not used to derive the grade of the Mineral Resources and Mineral Reserves)		

		(ii)	Express applicable volumes, grades and values in ranges (with appropriate clarifiers to denote lack of reliability of data). The use of "ranges" in this context has no statistical connotation (Not relevant – no Exploration Targets or exploration results are reported)	State all Diamond Resource estimates so as to convey the order of accuracy by rounding off to appropriately significant figures. (Section 4)	State all Diamond Reserve estimates so as to convey the order of accuracy of the estimates by rounding off to appropriately significant figures.

SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 11: Reporting of Diamonds and Gemstones					
11.4	Estimation and Modelling Techniques	(iii)	Discuss volume/tonnage, grade and value information per identified domain (where possible, even if in a very preliminary form) (Not relevant – no Exploration Targets or exploration results are reported)	Discuss volume/tonnage, grade and value information per identified domain (Section 4)	
		(iv)	If grades are reported then state clearly whether these are regional averages, based on microdiamond assessment, KIM analyses, or if they are selected individual samples taken from the property under discussion. The occurrence of individual diamonds or microdiamonds in surficial deposits or from inadequate samples (too small to be statistically valid) from a primary or secondary rock source would not typically qualify as an exploration target. This may not be true for marine deposits, in which case further explanation and discussion would be necessary. (Not relevant – no Exploration Targets or exploration results are reported)	State that the grades for the Diamond Resources are estimated from sampling data derived from the property itself (Section 4)	State that the grades for Diamond Reserves have been estimated from bulk-sampling and/or trial-mining
		(v)	Report all diamond values in US$/ct. If reference is made to local currencies then provide the prevailing exchange rate as well as the effective date of the exchange rate. Also supply the date of valuation. (Section 4, 5, 10, and 12)		
		(vi)	Specify details of the type and size of individual samples (including top and bottom cut-off size, in millimetres, used in the recovery). (Section 3, Section 4, and Section 10)		
		(vii)	Discuss the representivity of the type, size, number and location of the samples (Section 3 and Section 4)		

SAMREC TABLE 1					
			Exploration Results	**Mineral Resources**	**Mineral Reserves**
Section 11: Reporting of Diamonds and Gemstones					
11.4	Estimation and Modelling Techniques	(viii)	Discuss geostatistical estimation (where relevant) and interpolation techniques applied and their applicability to the deposit type (Not relevant – geostatistical techniques were not used to estimate the grade used to declare the Mineral Resources and Mineral Reserves)		
		(ix)	Specify the number and total weight (in carats) of diamonds recovered. The weight of diamonds recovered may only be omitted from the report when the diamonds are less than 0.5mm in size (i.e. when the diamonds recovered are microdiamonds) or when the diamonds are below a specified commercial cut-off value, which must be specified. (Section 5)		
		(x)		Disclose the number of stones and the total number of carats used in the SFD, grade and value estimation and discuss the validity of this data. (Not relevant to style of mineralization, although production data is reported in Sections 3, 4, and 5)	
		(xi)		Note whether a strict lower cut-off has been applied or if the modelled results include incidental diamonds below the lower cut-off? Discuss the implications. (Not relevant - grades were derived from production from the mine. Processing route described in Section 7)	
		(xii)		Present aspects of spatial structure analysis and grade and value distribution (Section 4, geostatistical techniques were not used to estimate the grade of the Mineral Resources)	
		(xiii)		Present aspects of micro and macro- diamond sample results per domain (Not relevant to style of mineralisation)	
		(xiv)		Present aspects of the effect on sample grade and value with change in bottom cut off screen size. (Not relevant to style of mineralization, furthermore, grades were derived from production from the mine)	
		(xv)		Describe any adjustments made to size distribution for sample plant performance and performance on a commercial scale, where applicable. (Not relevant - grades were derived from production from the mine)	
		(xvi)		Confirm that valuations have not been reported for samples of diamonds processed using total liberation methods (which are commonly used for processing kimberlite exploration samples and which are based on microdiamonds). (Not relevant to style of mineralisation)	

		(xvii)		Justify the use of microdiamonds to extrapolate diamond value at depth through the presentation of geological and size frequency distribution models (Not relevant to style of mineralisation)
		(xviii)		State the name, qualifications, experience and independence of the recognised expert responsible for the classification and valuation of the diamond parcel(s). (Not relevant to style of mineralisation)

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 11: Reporting of Diamonds and Gemstones					
11.4	Estimation and Modelling Techniques	(xix)		For each diamond parcel valued, supply information relating to the number of stones and the carats and size distribution using a standard progression of sieve sizes or diamond mass ranges for each identified geological domain. For marine or alluvial placers the average price per average stone size may be used instead of a size distribution (Section 10)	
		(xx)		State that the valuation is on the run-of-mine diamond parcel (i.e. not partial parcel) (Not relevant to style of mineralisation)	
		(xxi)		Define the unit of grade measure used in the resource/reserve estimation (e.g. carat per units of mass, area or volume). Where carats per unit of volume is used, include a discussion of mass to tonnage conversion. (Section 4)	
11.5	Resource/ Reserve Classification Criteria	(i)		A Diamond Resource/Reserve must be described in terms of volume/tonnage, grade and value. A Diamond Resource/Reserve must not be reported in terms of contained diamond content unless corresponding tonnages/volumes, grades and values are also reported. The average diamond grade and value must not be reported without specifying the applicable bottom cut-off screen size. (Section 5.7 Reserves)	
		(ii)		Discuss issues surrounding stone frequency (stones per cubic metre, per tonne, or per square metre) and stone size (carats per stone) relating to grade (carats per cubic metre, per tonne or per square metre). Consider the elements of uncertainty in these estimates and develop the Diamond Resource classification accordingly. (Section 5.7 Reserves)	
		(iii)		Present relevant aspects of stone size and number distribution, including the applicability of the parcel size. Note that a Diamond Resource/Reserve may not be declared without reference to an SFD. (Not relevant to style of mineralisation)	
		(iv)		Present aspects of global sample grade per geological domain and local block estimates in the case of Indicated Resources (Section 4)	
11.6	Audits and Reviews	(i)	State that the samples were sealed after excavation and discuss the chain of custody from source to reporting of results (Section 3)		
		(ii)	Discuss security standards in sampling plant and recovery sections of bulk-sampling/trial-mining programmes for macrodiamonds (Section 3 and Section 7, as relevant)		

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SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 11: Reporting of Diamonds and Gemstones					
11.6	Audits and Reviews	(iii)	Describe the type of facility, treatment rate, and accreditation (if any) of the sample plant. It is especially important to discuss the bottom screen size, top screen size and recrush parameters, in addition to the concentration methodology (e.g. pan, DMS, Optical, etc.) and the recovery technique (e.g. grease, X-ray, hand-sorting, etc.). (Section 7)		
		(iv)	Discuss valuer location, escort, delivery, cleaning losses, reconciliation with recorded sample carats and number of stones; (Section 10)		
		(v)	State whether core samples were washed prior to treatment for microdiamonds and discuss the use of diamond drill-bits (Not relevant to style of mineralisation)		
		(vi)	State whether any audit samples were treated at alternative facilities (Not relevant – grades are derived from production from the mine, and samples are not externally audited)		
		(vii)	Discuss QA/QC of sampling results, including the process efficiency, tailings auditing and granulometry (Not relevant – grades are derived from production from the mine, and so no QAQC of sample data is undertaken)		
		(viii)	Discuss the recovery of tracer monitors used in sampling and treatment (Not relevant – grades are derived from production from the mine, and so tracer monitors are used)		
		(ix)	Discuss geophysical (logged) density and particle density, where relevant (Section 3)		
		(x)	Discuss cross-validation of sample weights, wet and dry, with hole volume and density, moisture factor (Section 3)		

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SAMREC TABLE 1				
		Exploration Results	Mineral Resources	Mineral Reserves
Section 12: Reporting of Industrial Minerals				
12.1	Specific for Reporting of Industrial Minerals	(i)	Confirm that the reports on Industrial Mineral deposits take cognisance of Sections 80 of the Code and Sections 1 - 9 of Table 1. (Not relevant – No Industrial Minerals are reported)	
		(ii)	Describe the exploration or geologically specific specialised industry techniques appropriate to the minerals under investigation (Not relevant – No Industrial Minerals are reported)	
		(iii)	Describe the nature and quality of sampling or specific specialised industry standard measurement tools appropriate to the minerals under investigation (Not relevant – No Industrial Minerals are reported)	
		(iv)	Describe the appropriate saleable product qualities being reported. Describe the basis for reporting (physical or chemical parameters, air-dried basis, dry basis, etc.). Reporting of deleterious chemical elements or physical parameters is required. (Not relevant – No Industrial Minerals are reported)	
		(v)	State assumptions regarding in particular mining methods, infrastructure, metallurgy, environmental and social parameters. Explain where no mining related assumptions have been made. (Not relevant – No Industrial Minerals are reported)	
		(vi)	Disclose and discuss the marketing parameters, customer specifications, testing, and acceptance requirements. (Not relevant – No Industrial Minerals are reported)	
		(vii)	Discuss the nature, amount and representativeness of metallurgical studies completed which form the basis for the various saleable materials which may be priced for different chemical and physical characteristics. (Not relevant – No Industrial Minerals are reported)	
		(viii)	Present the defined reference point of the reported tonnages and grades/qualities. Where the reference point is the point is a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported. State whether the tonnages and grades/qualities of the material delivered to the plant or after recovery. (Not relevant – No Industrial Minerals are reported)	

SAMREC TABLE 1					
			Exploration Results	Mineral Resources	Mineral Reserves
Section 13: Reporting using Metal Equivalents					
13.1	Specific for Metal Equivalents Reporting	(i)	Confirm that reports on all deposits take cognisance of Sections 73 of the Code and Sections 1 - 9 of Table 1. (Not relevant – no metal equivalent grades are used for reporting either Mineral Resources or Mineral Reserves)		
		(ii)		Discuss and describe the basis for the grade estimation for each metal relating to the metal equivalence (Not relevant – no metal equivalent grades are used for reporting either Mineral Resources or Mineral Reserves)	
		(iii)		Disclose all economic criteria that have been used for the calculation such as exchange rates, revenue / price curves, royalties, cut-off grades, pay limits. (Not relevant – no metal equivalent grades are used for reporting either Mineral Resources or Mineral Reserves)	
		(iv)		Discuss the basis for assumptions or predictions regarding metallurgical factors such as recovery used in the metal equivalents calculation. (Not relevant – no metal equivalent grades are used for reporting either Mineral Resources or Mineral Reserves)	
		(v)		Show the calculation formula used. (Not relevant – no metal equivalent grades are used for reporting either Mineral Resources or Mineral Reserves)	

MRM SAMVAL Table 1

Criteria	Comments	Where complied with
T1.0 **General**	The Valuation Report shall contain: The signature of the CV; The CV'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's knowledge; A statement that the analyses and conclusions are limited only by the reported forecasts and conditions; A statement of the CV's present or prospective interest in the subject property or asset; A statement that the CV's compensation, employment, or contractual relationship with the Commissioning Entity is not contingent on any aspect of the Report; A statement that the CV 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 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.	Section 12.1 and Appendix C
T1.1 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.	Part of full CPR
T1.2 **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.	Part of full CPR – Executive Summary, Section 12.1 and 12.2
T1.3 **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 shall fully disclose any interests in the Mineral Asset or Commissioning Entity. Any restrictions on scope and special instructions followed by the CV, and how these affect the reliability of the valuation, shall be disclosed.	Section 1.1 and Section 12.1
T1.4 **Compliance**	A statement that the report complies with SAMVAL shall be included. Any variations shall be described and discussed.	Section 1.3.3
T1.5 **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.	Section 1.2 and Section 1.5.3
T1.6 **History**	History of activities, results, and operations to date shall be included.	Section 1.2.5
T1.7 **Geological Setting**	Geological setting, models, and mineralization shall be described.	Section 2
T1.8 **Exploration Results and Exploration Targets**	Exploration programmes, their location, results, interpretation, and significance shall be described. Exploration Targets shall be discussed.	Section 3
T1.9 **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 shall set out the manner in which he has satisfied himself that he can rely upon the information in the CPR.	Section 4.4 and Section 5.7.4
T1.10 **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 shall set out the manner in which he has satisfied himself that he can rely upon the technical information provided. (**<u>NOTE:</u>** 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 by the Southern African Minerals Environmental, Social and Governance Guideline (SAMESG) or other recognised code, e.g. Equator Principles.	Section 12.3
T1.11 **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.	Section 12.7
T1.12 **Valuation Approaches and Methods**	The valuation approaches and methods used in the valuation shall be described and justified in full.	Section 12.2
T1.13 **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.	Section 12.1
T1.14 **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.	Section 12.6 Section 12.8
T1.15 **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, shall be included.	Section 12.6, Section 12.1, Section 11

Criteria	Comments	Where complied with
T1.16 **Identifiable Component Asset (ICA) Values**	In some valuations, the valuation shall be broken down into Identifiable Component Asset Values (an ICA valuation) equalling 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. If the Mineral Asset Valuation includes an ICA Valuation, the CV shall satisfy himself or herself that the ICA Valuation is reasonable before signing off the Mineral Asset Valuation.	Not applicable
T1.17 **Historic Verification**	A historic verification of the performance parameters on which the Mineral Asset Valuation is based shall be presented.	Section 5.2
T1.18 **Market Assessment**	A comprehensive market assessment should be presented.	Section 10
T1.19 **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.	Section 12.9

APPENDIX

C LETTERS OF CONSENT

SRK Consulting (UK) Limited
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CERTIFICATE OF COMPETENT PERSON

As the author of the report entitled 'A Competent Persons Report on the Montepuez Ruby Mine, Mozambique' I hereby state:-

1. My name is Michael Beare, Director and Corporate Consultant (Mining Engineering), SRK Consulting UK Ltd, Level 5 Churchill House, 17 Churchill Way, Cardiff, CF10 2HH Wales, United Kingdom.
2. That I am a Chartered Member of the Institute of Mining, Materials and Metallurgy, C.Eng, MIMMM; Associateship of the Camborne School of Mines, ACSM
3. After starting my career in Tanzania working as a gemstone buyer and explorer, I have worked on a number of technical studies including the Grib Feasibility Study (Diamonds), various technical studies on the Kagem Emerald Mine in Zambia (Emeralds) a technical study on the Costcuez Mine in Colombia (Emeralds).
4. I am a 'Competent Person' as defined in the SAMREC Code.
5. I have worked as the Project Manager for the preparation of the 'A Competent Persons Report on the Montepuez Ruby Mine, Mozambique'.
6. I have not visited site but entrusted this aspect of the study to Mr Hanno Buys my colleague at SRK who prepared the mining section of the study.
7. As a CP, I am the lead CP for this report and for reporting of Ore Reserves and also responsible for Sections 1, 10 and 11 of this report.
8. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
9. I declare that this Report appropriately reflects the Competent Person's/author's view.
10. I am independent/not independent of Gemfields.
11. I have read the SAMREC Code (2016) and the Report has been prepared in accordance with the guidelines of the SAMREC Code.
12. I do not have, nor do I expect to receive, a direct or indirect interest in the Montepuez Rudy Mine.
13. At the effective date of the Report, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Cardiff, September 2018.

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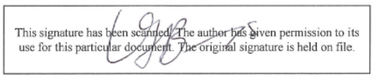
CERTIFICATE OF KEY TECHNICAL STAFF

As a contributor to the report entitled 'A Competent Persons Report on the Montepuez Ruby Mine, Mozambique' I hereby state:-

1. My name is Hanno (Ockert, Johannes) Buys, Independent Consultant (Mining) of SRK Consulting UK Ltd, Level 5 Churchill House, 17 Churchill Way, Cardiff, CF10 2HH Wales, United Kingdom.
2. I am a Member of the South-African Institute of Mining and Metallurgy, MSAIMM; registered professional engineer at the Engineering Council of South-Africa, ECSA, Licence number 20140091.
3. I hold a Masters degree in Engineering, MEng (Mining Engineering) from the University of Pretoria
4. As technical assistant, I mainly contributed to the mining section (Chapter 5), along with contributing to subsections in Chapter 6 and Chapter 8, relevant experience for technical assistance include open pit production experience (3 years) and open pit consulting experience (7years).
5. I am a key technical contributor to the CPR.
6. My main contribution to the competent persons report, under the guidance of the CP, was to tabulate reserve statement, evaluate mine technical work done to date (LoMp), site visitation, inputs into the mining infrastructure in place.
7. I undertook a site visit (site inspection) from 17-22 September 2017 at Montepuez Ruby Mine in Mozambique. During the site visit, I visited the mining operations, various exploration sites, maintenance workshops, parts warehouse, waste dumping areas, stockpiles, old workings, mining camp, offices and the ruby sorting house.
8. As a key technical contributor to the CPR, I am responsible for Chapter 5 of this report and subsections of Chapter 6 and Chapter 8.
9. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
10. I declare that the sections of this report detailed in 8 above appropriately reflects the author's view.
11. I am independent of Pallinghurst and its subsidiary and Gemfields.
12. I have read the SAMREC Code (2016) and the Report has been prepared in accordance with the guidelines of the SAMREC Code.
13. I do not have, nor do I expect to receive, a direct or indirect interest in the Montepuez Ruby Mine or Pallinghurst or Gemfields nor am I an employee, shareholder or director or other interested party in respect of the issuer Pallinghurst or the project/mine.

14. At the effective date of the Report, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Cardiff, September 2018.



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CERTIFICATE OF COMPETENT PERSON

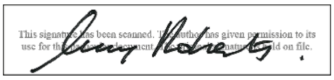
This Certificate of Competent Person is given only as a guide to the CP. It is designed to incorporate all of the requirements of the Code.

As the author of the report entitled ‘A Competent Persons Report on the Montepuez Ruby Mine, Mozambique’, I hereby state:-

1. My name is Dr Lucy Roberts, MAusIMM (CP) and Principal Consultant (Resource Geology), SRK Consulting UK Ltd, Level 5 Churchill House, 17 Churchill Way, Cardiff, CF10 2HH Wales, United Kingdom.
2. That I am a Chartered Professional Member of the Australasian Institute of Mining and Metallurgy. My membership number is 211381.
3. I hold a BSc(Hons) in Exploration Geology and MSc in Mineral Resources from Cardiff University, in the United Kingdom. I also a hold a PhD in Applied Geostatistics from James Cook University, Australia.
4. I have worked on various gemstone projects over the last 10 years, including various technical studies on the Kagem Emerald Mine in Zambia (Emeralds), previous involvement at Montepuez (rubies), geological modelling and review of various other gemstone projects in Mozambique, Zambia, and the former Soviet Union.
5. I am a ’Competent Person’ as defined in the SAMREC Code.
6. My main contribution to the competent persons report, was to act as the CP for the Mineral Resources, which included reviewing the geological modelling completed by MRM and my colleagues, and to write the relevant sections of the CPR. I also authored and tabulated the Mineral Resource Statements presented.
7. I undertook a site visit (site inspection) from 17-22 September 2017 at Montepuez Ruby Mine in Mozambique. During the site visit, I visited the mining operations, various exploration sites, maintenance workshops, parts warehouse, waste dumping areas, stockpiles, old workings, mining camp, offices and the ruby sorting house.
8. As a CP I am responsible for Sections 2, 3 and 4 of this report.
9. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
10. I declare that this Report appropriately reflects the Competent Person’s view.
11. I am independent of Pallinghurst and its subsidiary, Gemfields.
12. I have read the SAMREC Code (2016) and the Report has been prepared in accordance with the guidelines of the SAMREC Code.
13. I do not have, nor do I expect to receive, a direct or indirect interest in the Montepuez Ruby Mine, Pallinghurst or its subsidiary, Gemfields.
14. At the effective date of the Report, to the best of my knowledge, information and belief, the Report

contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Cardiff, September 2018.



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CERTIFICATE OF KEY TECHNICAL STAFF

As a contributor to the report entitled 'A Competent Persons Report on the Montepuez Ruby Mine, Mozambique' I hereby state:-

1. My name is James Haythornthwaite, Consultant (Geology) of SRK Consulting UK Ltd, Level 5 Churchill House, 17 Churchill Way, Cardiff, CF10 2HH Wales, United Kingdom.
2. I am a Fellow of the Geological Society of London.
3. I hold a Master of Science Degree, MSc (Mining Geology) from Camborne School of Mines, University of Exeter and a Batchelor of Science Degree, BSc (Geology) from Durham University.
4. I have over 6 years of experience in resource geology in the mining sector. I specialise in 3D geological modelling, resource estimation and the interpretation of structurally complex mineral deposits. I have broad technical experience in multiple commodity types, including iron ore, base metals, precious metals and coloured gemstones, predominantly in Africa and Europe.
5. I am a key technical contributor to the CPR.
6. My main contribution to the competent persons report, under the guidance of the CP was to review and adjust the volumetric gravel bed model used to constrain the MRM resource. I also contributed to the text in Sections 2, 3 and 4 of the report.
7. I did not visit site as part of this specific commission, but visited the Montepuez Project site in 2015 as part of a previous commission. During this site visit I reviewed the geology and drilling and sampling procedures employed.
8. As a key technical contributor to the CPR, I am responsible for subsections of Chapters 2, 3 and 4 of this report.
9. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
10. I declare that the sections of this report detailed in 8 above appropriately reflects the author's view.
11. I am independent of Pallinghurst Resources Ltd.
12. I have read the SAMREC Code (2016) and the Report has been prepared in accordance with the guidelines of the SAMREC Code.
13. I do not have, nor do I expect to receive, a direct or indirect interest in the Montepuez Ruby Mine or Pallinghurst Resources Ltd.

14. At the effective date of the Report, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Cardiff, September 2018.

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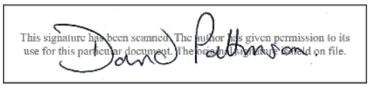
CERTIFICATE OF KEY TECHNICAL STAFF

As a key technical contributor to the report entitled 'A Competent Persons Report on the Montepuez Ruby Mine, Mozambique' I hereby state:-

1. My name is David Pattinson, Corporate Consultant (Metallurgy & Minerals Processing), SRK Consulting UK Ltd, Level 5 Churchill House, 17 Churchill Way, Cardiff, CF10 2HH Wales, United Kingdom.
2. I am a member of the Institute of Materials, Mining and Metallurgy, MIMMM, and a Chartered Engineer, CEng.
3. I hold a Bachelors degree in Minerals Engineering, BSc, and a Doctorate, PhD, both from Birmingham University in the UK.
4. I have over 35 years' experience in the Non-Ferrous Mining Industry and worked for more than 23 years for an international engineering company involved in numerous feasibility studies, process plant design and commissioning. For the past 12 years I have worked for SRK as a Corporate consultant and have been involved in feasibility studies and due diligence projects.
5. I am a key technical contributor to the CPR.
6. My contribution to the CPR was a review of the sorting plant operation including the physical plant and the operating costs.
7. I undertook a site visit (site inspection) from 17-22 September 2017 at Montepuez Ruby Mine in Mozambique. During the site visit, I visited the mining operations, the processing facilities, the tailings disposal area and the gemstone sort house.
8. As a key technical contributor I am responsible for Sections 7 of this report.
9. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
10. I declare that the sections of this report detailed in 8 above appropriately reflects the authors view.
11. I am independent of Pallinghurst Resources Ltd and its subsidiary Gemfields.
12. I have read the SAMREC Code (2016) and the Report has been prepared in accordance with the guidelines of the SAMREC Code.
13. I do not have, nor do I expect to receive, a direct or indirect interest in the Montepuez Ruby Mine or Pallinghurst Resources Ltd and its subsidiary Gemfields.

14. At the effective date of the Report, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Cardiff, September 2018.



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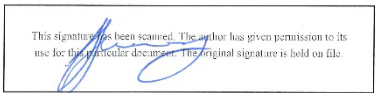
CERTIFICATE OF KEY TECHNICAL STAFF

As a contributor to the report entitled 'A Competent Persons Report on the Montepuez Ruby Mine, Mozambique' I hereby state:-

1. My name is John Merry, Principal Consultant (Environment and Social) of SRK Consulting UK Ltd, Level 5 Churchill House, 17 Churchill Way, Cardiff, CF10 2HH Wales, United Kingdom.
2. I am an Associate Member of the Institute for Environmental Management and Assessment.
3. I hold a MPhil & BSc .
4. I am a Principle Consultant with over 20 years of experience in social and environmental management in the mining sector. I have worked on projects covering a number of different commodities including, iron ore, gold, copper, diamonds and coal. My areas of expertise include; project management; project design; health, safety and environment; community development strategies, stakeholder engagement and government interface. I have also managed a number of EIA processes for various commodities.
5. I am a key technical contributor to the CPR.
6. I have undertaken a review of the environmental and social performance of the MRM operations in northern Mozambique against recognised international standards. These include the IFC performance standards as well as the ICMM 10 Principles. Reference was also made to the SAMESG Guideline as part of the scope for the review and site visit.
7. The site visit to the MRM operation was undertaken 26 – 29 September 2017.
8. As a key technical contributor to the CPR, I am responsible for Section 9 of this report.
9. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
10. I declare that the sections of this report detailed in 8 above appropriately reflects the author's view.
11. I am independent of Pallinghurst Resources Ltd.
12. I have read the SAMREC Code (2016) and the Report has been prepared in accordance with the guidelines of the SAMREC Code.
13. I do not have, nor do I expect to receive, a direct or indirect interest in the Montepuez Ruby Mine or Pallinghurst Resources Ltd.

14. At the effective date of the Report, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Cardiff, September 2018.



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CERTIFICATE OF COMPETENT VALUATOR

As an author of the report entitled 'A Competent Persons Report on the Montepuez Ruby Mine, Mozambique' I hereby state:-

1. My name is Keith Joslin, Independent Consultant (Mining) of SRK Consulting UK Ltd, Level 5 Churchill House, 17 Churchill Way, Cardiff, CF10 2HH Wales, United Kingdom.
2. Member of the Southern African Institute of Mining and Metallurgy, MSAIMM; Associateship of the Camborne School of Mines, ACSM.
3. I have over 30 years' experience in the mining industry. Keith has worked as a mining consultant since 2010 and have been a Project Manager on due diligence reviews, undertook economic assessments and valuations on a number of due diligence and technical Projects and acted as a competent person signing off Ore Reserves for underground platinum projects. I spent over 20 years in South Africa on platinum, gold and diamond operations in both operational and corporate roles. At Anglo Platinum I was involved in the evaluation and valuation of the company's portfolio of business units through to new projects and also involved in due diligence reviews of major capital projects and annual reviews of current. I have also been an analyst on the Johannesburg Stock Exchange and spent time in Management Consulting to the mining industry.
4. I am a 'Competent Valuator' as defined in the SAMVAL Code.
5. As the CV I have been responsible for the preparing an update of the financial model for inclusion in this CPR .
6. I have not visited site but entrusted this aspect of the study to Mr Hanno Buys my colleague at SRK who prepared the mining section of the study.
7. This CPR has been prepared based on a technical and economic review by a team of consultants sourced from the SRK Group's offices in the United Kingdom over a nine-month period. In preparing this valuation reliance has been placed on the SRK team as a whole but specifically Mr. Mike Beare, lead CP, Dr. Lucy Roberts (CP Resources and site visit) and Mr. Hanno Buys (Mining and site visit). I am satisfied with the technical information provided by this team.
8. As a CV, I am responsible for Section 12 of this report.
9. I am not aware of any material fact or material change with respect to the subject matter of the Report that is not reflected in the Report, the omission of which would make the Report misleading.
10. This analysis and conclusions are limited only by the forecasts of production, commodity prices, future sales, operating and capital costs
11. I declare that this Report appropriately reflects the Competent Valuator's view.
12. I am independent of both Gemfields and Pallinghurst.
13. I have read the SAMVAL Code (2016) and the Report has been prepared in accordance with the guidelines of the SAMVAL Code.

14. I do not have, nor do I expect to receive, a direct or indirect interest in the Montepuez Rudy Mine.
15. At the effective date of the Report, to the best of my knowledge, information and belief, the Report contains all scientific and technical information that is required to be disclosed to make the Report not misleading.

Dated at Cardiff, September 2018.

Keith Joslin
SRK Consulting UK Ltd

APPENDIX

D GLOSSARY OF TERMS, ABBREVIATIONS AND UNITS

MRM CPR Ruby Glossary

Term	Definition
Assay	The chemical analysis of mineral samples to determine the metal content.
Capital Expenditure	All other expenditures not classified as operating costs.
Composite	Combining more than one sample result to give an average result over a larger distance.
Concentrate	A metal-rich product resulting from a mineral enrichment process such as gravity concentration or flotation, in which most of the desired mineral has been separated from the waste material in the ore.
Cut-off Grade (CoG)	The grade of mineralized rock, which determines as to whether or not it is economic to recover its gold content by further concentration.
Dilution	Waste, which is unavoidably mined with ore.
Dip	Angle of inclination of a geological feature/rock from the horizontal.
Fault	The surface of a fracture along which movement has occurred.
Footwall	The underlying side of an orebody or stope.
Gangue	Non-valuable components of the ore.
Grade	The measure of concentration of gold within mineralized rock.
Hangingwall	The overlying side of an orebody or slope.
Igneous	Primary crystalline rock formed by the solidification of magma.
Lithological	Geological description pertaining to different rock types.
Mineral/Mining Lease	A lease area for which mineral rights are held.
Mining Assets	The Material Properties and Significant Exploration Properties.
Ongoing Capital	Capital estimates of a routine nature, which is necessary for sustaining operations.
Pillar	Rock left behind to help support the excavations in an underground mine.
Sedimentary	Pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks.
Shaft	An opening cut downwards from the surface for transporting personnel, equipment, supplies, ore and waste.
Sill	A thin, tabular, horizontal to sub-horizontal body of igneous rock formed by the injection of magma into planar zones of weakness.
Stope	Underground void created by mining.
Stratigraphy	The study of stratified rocks in terms of time and space.
Strike	Direction of line formed by the intersection of strata surfaces with the horizontal plane, always perpendicular to the dip direction.
Tailings	Finely ground waste rock from which valuable minerals or metals have been extracted.
Thickening	The process of concentrating solid particles in suspension.
Total Expenditure	All expenditures including those of an operating and capital nature.

MRM CPR Ruby Abbreviations

Abbreviation	Unit or Term
º	Degree/s
ºC	Degrees Celsius
~	Approximately/circa
>	Greater than
<	Less than
%	percent
µm	micron/s
ADP	ADP Projects (PTY) LTD, Cape Town, South Africa
BGS	British Geological Survey
CAPEX	Capital Expenditure; all other expenditures not classified as operating costs
cm	centimetre
cm^2	square centimetre
cm^3	cubic centimetre
CoG	cut-off grade
CP	Competent Person
CPI	Consumer Price Index
CPR	Competent Persons Report
ct	carat
ct/t	Carat per tonne
CV	Competent Valuator
dia	diameter
DMS	Dense media separation
DUAT	Land Use Permit
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortisation
EDM	Electricidade de Moçambique
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
Equator	Equator Drilling
Fe	Iron
FEL	Front End Loader
g	gram
g/L	gram per litre
g/t	grams per tonne
GB	Gravel Bed
Gemfields	Gemfields Plc
GPR	ground penetrating radar
ha	hectares
HLS	Heavy Liquid Separation
IMMT	Council of Scientific and Industrial Research, Institute of Minerals and Materials Technology, India
IRR	Internal Rate of Return
JORC Code	The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves
JSE	Johannesburg Stock Exchange
k	thousand (kilo)
kg	kilograms
km	kilometre
km^2	square kilometre
kt	thousand tonnes
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
kWh/t	kilowatt-hour per metric tonne
LoM	Life of mine
LoMP	Life of mine plan

Abbreviation	Unit or Term
M	Million (mega)
m	metre
m^2	square metre
m^3	cubic metre
Ma	Million years
masl	metres above sea level
MDS	Mineral Density Separation
mg/L	milligrams/litre
mm	millimetre
mm^2	square millimetre
mm^3	cubic millimetre
Montepuez	Montepuez Ruby Mine
Moz	million troy ounces
mRL	Relative Level (m)
MRM	Montepuez Ruby Mine
Mt	million tonnes
MTADR	Ministry of Lands, Environment and Rural Development
NGU	Norges Geolgiske Undersakelse
NorConsult	NorConsult AS an Eteng
NPV	Net Present Value
OEM	Original Equipment Manufacturers
OPEX	Operating
Pallinghurst	Pallinghurst Resources Ltd
QA/QC	Quality Assurance/Quality Control
RAP	Resettlement Action Plan
RC	rotary circulation drilling
RoM	run of mine
ROM	Run of mine
SAMREC Code	The South African Code For The Reporting Of Exploration Results, Mineral Resources And Mineral Reserves
SAMVAL Code	The South African Code For The Reporting Of Mineral Asset Valuation
SAMESG	The South African Guideline For The Reporting Of Environmental, Social And Governance Parameters Within The Solid Minerals And Oil And Gas Industries
sec	second
SG	specific gravity
SPT	standard penetration testing
SRK	SRK Consulting (UK) Ltd
SRK	SRK Consulting (UK) Ltd
SRTM	Shuttle Radar Topography Mission
t	tonne (metric ton)
t_{dry}	Tonne (metric ton) undiluted by moisture
TEM	Technical Economic Model
Terravision	Terravision Radar
TMI	total magnetic intensity
tpa	tonnes per year
tpd	tonnes per day
tph	tonnes per hour
TSF	tailings storage facility
TSP	total suspended particulates
USD	United States dollar
UV	Ultra violet
V	volts
VFD	variable frequency drive
W	Watt
WACC	Weighted Average Cost of Capital
XRD	x-ray diffraction
XRF	X-ray fluorescence
y	Year