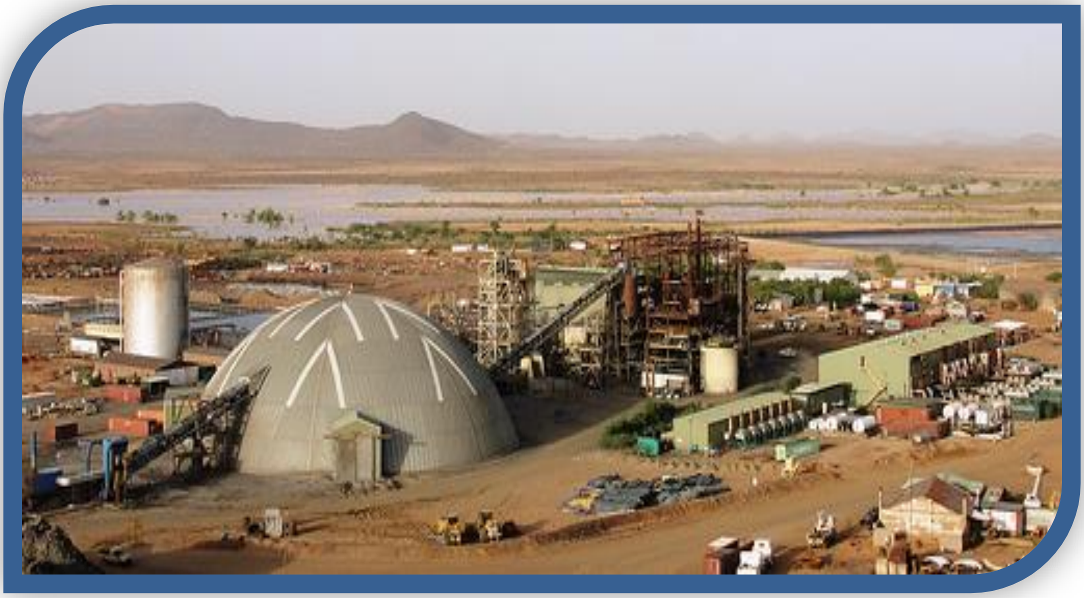
FIRST QUANTUM MINERALS LTD.

Guelb Moghrein Copper Gold Mine, Inchiri, Mauritania

NI 43-101 Technical Report

30th March 2016



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ITEM 1 **SUMMARY**

1.1 Project Background

This Technical Report on the Guelb Moghrein Mine (the Mine) has been prepared by Mr Tony Cameron of Cameron Mining Consulting Ltd (CMC), and Messrs David Gray and Andrew Briggs of First Quantum Minerals Ltd (the issuer or FQM or the Company) as Qualified Persons (QP's) on behalf of FQM. The QP's have prepared this Technical Report to document updated Mineral Resource and Mineral Reserve estimates, economic evaluations and supporting ancillary documentation associated with FQM's Guelb Moghrein mine in Mauritania, North West Africa.

This report and the resource/reserve estimates discussed therein represent the culmination of results of a series of reviews and updates undertaken by FQM (the issuer) since mining startup in April 2006.

This report supersedes the NI 43-101 Technical Report (previous TR) issued by FQM and dated March 2008.

1.2 Property Location, Ownership and Approvals

The Guelb Moghrein copper-gold mine is 100% owned by Mauritanian Copper Mines (MCM), a subsidiary of FQM. The mine is located 250 km northeast of the nation's capital, Nouakchott, near the town of Akjoujt. FQM acquired an 80% interest in the asset in 2004 and achieved commercial production in 2006. In 2010, the Company increased its ownership in Guelb Moghrein to 100%.

In addition to the Guelb Moghrein mining concession of 81 km^2, valid until 2042, the Company holds five exploration concessions in the area totalling 5,581 km^2 either directly through MCM or since 2011, through Mauritania Exploration SARL a wholly-owned entity.

1.3 Geology and Mineralisation

Guelb Moghrein mineralisation may be classed as a structurally modified iron ore copper gold (IOCG) deposit that is hosted in a coarse grained ferro-magnesian carbonate (FMC) unit. Copper and gold mineralisation is largely coincident with some evidence for elevated gold in the shallow mined out upper zones. The main sulphide minerals are chalcopyrite and pyrrhotite with magnetite becoming more abundant external to the sulphide bodies. The zones of mineralisation were strongly controlled by tectonic shearing and faulting which resulted in topographic expressions of the deposit in the form of two hills known as the Occidental and Oriental hills. Mineralisation below Occidental hill is considerably larger than that at Oriental, and dips by about 20 degrees to the south with a strike length close to 700 m and a dip extent of close to 1,000 m. The Occidental mineralised vertical width varies according to structural controls and ranges from a few meters to several 10's of metres. The mineralisation below Oriental hill is limited to the shallow outcropping area of the hill and has an ellipsoid shape with a strike length of around 250 m and a width of about 100 m.

1.4 Exploration Status

Exploration has been carried out on the Guelb deposit over several generations since the 1960s. Since the previous TR, exploration completed by the issuer includes several campaigns focused on targeting remaining mineralisation opportunities in the areas adjacent to Guelb. Exploration personnel completed studies focussed on improving understanding about the geological controls of Guelb Moghrein mineralisation. These findings were used to assist with targeting criteria. Infill and extensional drilling, not classed as exploration, has been completed by the issuer across the Oriental deposit and the deeper areas of the Occidental deposit. Results have sterilised these immediate surrounds.

1.5 Mining and Production Status

Mining at Guelb Moghrein is carried out in a single open pit using hydraulic excavators and mechanical drive haul trucks. Sulphide ore is treated in an adjacent processing plant producing a copper-gold concentrate. During 2015 the plant produced approximately 17,000 tonnes of concentrate per month at a grade of 22.5% Cu with credits received for gold in the concentrate. Total production for the year was 45,001 tonnes of copper in concentrate with 47,322 oz of gold also in the concentrate. A total of 27.5 Mt was mined 2015, made up of 3.8 Mt of ore and 23.7 Mt of waste.

A magnetite plant was commissioned during first quarter of 2015. After successful commissioning, operation of that plant was subsequently suspended due to low iron ore prices.

1.6 Mineral Resource Estimate

FQM has completed a Mineral Resource estimate (Table 1-1) update in March 2016 using the available drillhole database, which included all diamond and reverse circulation drillhole sample results together with an updated interpretation of the geological model relevant to the spatial distribution of copper and gold mineralisation. Blast hole sample data was included in this estimate for supporting the spatial distribution of mineralisation. Interpolation parameters were based upon the geology, styles of mineralisation, drill hole spacing and geostatistical analysis of the data. Mineral Resource estimates were classified according to geological continuity, QAQC, density data, drillhole grid spacing, grade continuity and confidence in the panel grade estimate and have been reported in accordance with the guidelines of the Australasian JORC Code (JORC, 2012), which in turn complies with the Standards on Mineral Resources and Reserves of the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM Guidelines, 2014).

Table 1-1 March 2016 Guelb Moghrein Mineral Resource statement depleted of mined material as at 31st December 2015 and using a CuEq cutoff of 0.5% for resources north of the 19,300m northing and a Cu cutoff of 0.5% for resources south of 19,300m northing.

Material	Classification	Tonnes (Mt)	Cu %	Au g/t	As %	Cu t	Au oz
Sulphide	Measured	18.21	0.79	0.63	0.07	144,523	369,138
Sulphide	Indicated	17.86	0.87	0.73	0.10	154,739	419,084
Measured & Indicated		**36.07**	**0.83**	**0.68**	**0.09**	**299,262**	**788,222**
Sulphide	Inferred	0.63	0.88	0.66	0.11	5,598	13,496

Material	Classification	Tonnes (Mt)	Cu %	Au g/t	As %	Cu t	Au oz
Oxide	Measured	0.08	1.40	1.81	0.04	1,136	4,724
Oxide	Indicated	7.42	0.86	0.73	0.10	63,622	174,239
Measured & Indicated		**7.51**	**0.86**	**0.74**	**0.10**	**64,759**	**178,962**
Oxide	Inferred	1.76	0.72	2.41	0.18	12,625	136,889

Material	Classification	Tonnes (Mt)	Cu %	Au g/t	As %	Cu t	Au oz
Total Measured & Indicated		**43.57**	**0.84**	**0.69**	**0.09**	**364,021**	**967,184**
Total Inferred		**2.40**	**0.76**	**1.95**	**0.16**	**18,222**	**150,384**

Measured and Indicated sulphide resources at Occidental, as relevant to the Mineral Reserves, were compared to the previous estimate using the previous Cu cutoff grade of 0.5%. This resource update has increased copper and gold metal available for mining due to a mineralised volume and density increase of 6% each. Net tonnages increase by 12% with copper and gold grades also increasing. This has supported this resource estimate, now being defined by a copper gold equivalent cutoff grade. These changes have resulted from additional grade control drillhole data, improved geology understanding, improved estimation methods and development of extensional opportunities.

As well as Occidental, this estimate update has incorporated further development of the adjacent Oriental extension, which will continue to be the focus for further geological and economic evaluation from 2016 onwards.

Currently, Guelb Moghrein's mineralised volumes are still not closed off by drilling, suggesting further potential for extensions, and hence mine life, from the planned infill and extensional drilling of 2016.

1.7 Mineral Reserve Estimate

As at the 31st of December 2015, the Guelb Moghrein pit has 21.4 Mt of Mineral Reserve remaining. This estimate uses the categories of Mineral Reserve estimates permitted under the CIM Guidelines, 2014, within the designed final pits based on Measured and Indicated Mineral Resources.

A further 1.9 Mt of ore is on the ROM stockpile and 6.6 Mt of Low Grade material is on the long term stockpiles.

Table 1-2 Guelb Moghrein Reserve Estimate, at $3.00/lb Cu and $1,200/oz Au

Guelb Moghrien Sulphide Ore Reserve Estimate December 31 2015				
	Volume Mbcm	Tonnes Mt	Tcu %	Au g/t
Pit				
Proven Reserve	3.4	12.7	0.81	0.63
Probable Reserve	2.3	8.6	0.89	0.80
Total	5.7	21.4	0.84	0.70
ROM Stockpile				
Proven Reserve	0.7	1.9	0.90	0.97
Probable Reserve	-	-	-	-
Total	0.7	1.9	0.90	0.97
Reserve Without Low Grade				
Proven Reserve	4.1	14.7	0.82	0.68
Probable Reserve	2.3	8.6	0.89	0.80
Total	6.4	23.3	0.85	0.72
Low Grade Stockpile				
Proven Reserve	2.5	6.6	0.42	0.55
Probable Reserve	-	-	-	-
Total	2.5	6.6	0.42	0.55
Reserve Including Low Grade				
Proven Reserve	6.6	21.3	0.70	0.64
Probable Reserve	2.3	8.6	0.89	0.80
Total	8.9	29.9	0.76	0.68

Mine plans that support these Mineral Reserves have been optimised such that ore feed considers current market metal price fluctuations. The long term consensus metal prices as utilised allow stockpiles to be reclaimed and treated towards the end of the mine life.

1.8 Production Schedule

As at the end of December 2015, Guelb Moghrein has almost 8 years of production remaining using current Proved and Probable open pit Mineral Reserves (including stockpiles) with a process feed rate of 4 Mt per year.

The Mineral Reserve estimate resulting from the redefined cutoff criteria results in an additional one years worth of mining when compared to previous estimates and at this point does not include the Oriental extensions, for which ongoing studies are underway.

Table 1-3 Guelb Moghrein Life-of-Mine Production Schedule

		UNITS		TOTAL	2016	2017	2018	2019	2020	2021	2022	2023
MINING												
	Waste	Tonnes	Mt	**54.0**	18.9	18.2	11.7	2.2	2.0	1.0		
	Ore	Tonnes	Mt	**21.4**	3.0	3.8	3.6	3.8	4.1	3.0		
	Total Mined	Tonnes	Mt	**75.4**	22.0	22.0	15.4	6.0	6.2	4.0		
	Strip ratio		t:t	**2.5**	6.2	4.8	3.2	0.6	0.5	0.3		
PROCESSING SUMMARY												
	Feed to Plant	Tonnes	Mt	**29.9**	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.9
		Cu	%	**0.76%**	0.92%	0.92%	0.92%	0.78%	0.81%	0.58%	0.51%	0.42%
		Au	g/t	**0.68**	0.72	0.75	0.73	0.72	0.70	0.63	0.60	0.55
	Plant Recovery	Cu	%	**89.9%**	92.1%	92.1%	92.2%	90.3%	88.5%	87.5%	87.5%	87.5%
		Au	%	**62.0%**	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
	Metal in Concentrate											
		Cu	Kt	**204.2**	33.9	34.0	34.0	28.1	28.6	20.4	17.9	7.2
		Au	koz	**407.5**	57.4	60.1	58.1	57.1	55.5	50.4	48.0	21.1

Compared with previous life of mine schedules, this schedule represents an increase in mine life of approximately 1 year. Planned near-mine infill and extensional drilling and ongoing evaluation of open pit and underground extensions are being assessed with the aim of further increasing mine life.

1.9 Processing

Ore from the open pit mine and stockpiles is crushed, milled and then undergoes sulphide flotation to produce a copper-gold concentrate, which is shipped to offshore smelters (mainly in China).

Since commissioning, the Process plant capacity has been expanded from 2 Mtpa to 4 Mtpa with current management focussing on improving recoveries and costs. A CIL plant was commissioned in 2008 and a magnetite plant was commissioned in 2015. Both of these plants are currently non-operational as they are not economic to run under current circumstances.

The current process flowsheet is described in item 17. The unit processes currently are:

- primary crushing and ore stockpiling
- grinding in a 5.8 MW SAG mill and 4 MW ball mill
- gravity recovery of gold within the ball milling circuit
- trash screening for fibre removal
- rougher flotation
- three stages of cleaner flotation, including regrind and column flotation
- gravity recovery of gold on reground cleaner concentrates
- dewatering of mixed flotation and gravity concentrates in a thickener and ceramic disc filters
- (recovery of high grade magnetite from flotation tailings) – currently not in operation
- dewatering of flotation tails in a tailings thickener, and recycle of process water
- tailings pumping to TSF 2, and return of decant water
- reagent mixing, storage and distribution
- water supply from borefields at Bennichab
- power supply from on-site diesel generators
- other services

1.10 Project Infrastructure

All infrastructure required by Geulb Moghrein is in place and has been successfully operating for many years. These includes sealed access roads, security, power plant lines and transformers, process plant, site offices, workshops, tailings dam, and waste storage facilities.

1.11 Environmental Status

MCM has submitted Environmental Impact Assessments to the authorities as required (the most recent being in 2014) and is in compliance with all commitments made to date.

As part of the commitment to the environment, MCM have undertaken to clean up areas that were left behind by previous owners. This includes: -

- The Morak tailings dam and contaminated sub soil were removed and placed within the lined CIL gold tailings storage facility. The Morak tailings footprint has since been rehabilitated with indigenous vegetation;
- Waste rock was dumped on the old TORCO tailings with the main objective being reduction of dust pollution;
- Significant non-hazardous and hazardous waste including scrap metal and hydrocarbons have been removed from site and disposed of in accordance with acceptable standards.

1.12 Community and Social

The MCM team has developed good relationships with local communities as well as regional and national authorities. MCM continues to pursue its aim to make its presence in the region an opportunity for its host community and the country as whole. The Inchiry region is among the poorest in the country and as well as providing employment opportunities, MCM is actively involved in community development programs.

1.13 Capital and Operating Cost Estimates

The Guelb Moghrein copper mine has been operating for 10 years and there are no further major capital expenditures planned at this point in time. Replacement of mining equipment and major processing plant components have been incorporated into the operating costs used in mine planning and cashflow models.

The operating costs listed in this report are based on actual costs from mining and processing activities up to and including December 2015, and budget forecasts for 2016 onwards.

1.14 Economic Evaluation

Using the Reserves, the LOM Schedule, and the input parameters detailed in this report, the undiscounted cashflow for the mine remains positive. Sensitivity analysis also confirmed that Guelb Moghrein is profitable and robust. This supports using the copper gold equivalent grade as the basis for reserve estimation.

1.15 Conclusions and Recommendations

1.15.1 Mineral Resource estimate

In respect of the Mineral Resource estimate, and on the opinion of David Gray (QP), the classifications applied to the estimates of the Guelb Moghrein copper gold deposit accurately reflect the confidences in the available sample data, the geological model and the resulting grade estimates.

The understanding of close spaced geological and grade continuity has been improved by considering in-pit geology exposures and the blast hole grade control drilled samples in developing the mineralised volumes. In turn this has added confidence to definition of different domains of mineralisation and the robustness of the resulting block estimates. The quality of the diamond and reverse circulation data added since the previous TR has been assured through a sound program of quality assurance and quality control (QAQC). No deviations or biases between these two data sets were noted.

Inferred resource classification was limited to estimates located along the edges of mineralisation having at least one drillhole intersection within 100 m.

Compared to the previous estimate, the 2016 Mineral Resource estimate has increased copper and gold metal through increased grades and mineralised tonnages. This was guided by:

1. Additional diamond and reverse circulation drilling and sampling completed since the previous TR estimate as infill and extension at Oriental and Occidental deeps
2. In-pit exposures and pit geology mapping of lithology and structure
3. Use of blast hole sample data for better definition of mineralised volumes
4. Improved understanding in geological and grade continuity has resulted in additional mineralisation domains, which in turn allow for more robust variography and robust block grade estimates
5. Improvement of estimation methods from improved geostatistics, block dimensions, sample selection routines

Recommendations include:

- Continue with planned infill and extensional drilling in the near pit and deeper extension areas in order to improve confidence of Indicated Resources estimates and to develop mineralisation extension opportunities including Oriental
- Continue to improve upon QAQC routines for drilled samples
- Develop the deposits 3D structural framework model for improved domaining and extensional targeting

1.15.2 Metallurgical Testwork and Processing

With the operation currently at a mature stage the following areas for improvements are in progress:

- Alternative flotation reagent trials optimise pyrrhotite depression;
- Additional Knelson by the Q3 2016;

- Investigation into gravity concentrate processing options to produce bullion;
- Testwork and subsequent plant trial is currently in progress to produce magnetite of high quality that may be used for the dense media industry for cleaning of coal production – with a significant price premium over standard magnetite pricing;
- Investigation on additional column cell in the final cleaning state.

1.15.3 Geotechnical Engineering

Wall rock is competent and management systems are in place to monitor slope stability and to periodically review new data. External geotechnical consultants are utilised to assist and advise the MCM team.

1.15.4 Mineral Reserve Estimate

The data is adequate to support the Mineral Reserve estimates using the categories of Mineral Reserve estimates permitted under NI 43-101 within the designed final pits and based upon Measured and Indicated Resources only.

Recommendations include:

- Continue to refine mine designs based on the results from ongoing grade control drilling, reconciliation, and Resource model updates.
- Monitor ore reconciliation to obtain data on the new model in relation to dilution and loss. Update estimates if required.
- Review the optimisation results for the Oriental deposit. Assess whether a sulphide only pit is economically viable and should be added to the Reserve and LOM schedule.
- Continue monitoring of pit slopes and using data so obtained to review design parameters. It is noted that it may be possible to steepen some slopes and reduce waste stripping costs, however, this needs to be evaluated carefully and weighed up against the risk of wall failure.

1.15.5 Mining

The mine footprint has expanded to the final pit limits and the final pushback is being developed in order to maintain ore supply for the life of mine. Production targets are being met and MCM has sufficient equipment on site to meet the future targets. The only issue in relation to mining is blast performance. This has been found to be a product related issue and MCM is working with the supplier to resolve the issue. With respect to slope stability, the wall rock is competent and management systems are in place.

Recommendations include:

- Consider replacing the explosives supplier if the current supplier cannot resolve the product related issues.
- Continue to follow geotechnical guidelines and monitor pit walls as per the management plan.

1.15.6 Environmental Compliance

The environmental compliance risk for Guelb Moghrein is considered to be low.

The Government of Mauritania has indemnified FQM and MCM from responsibility for any environmental degradation or pollution caused by previous operators of the site. Nevertheless, FQM has made a commitment to clean-up the mine site where it is practicable and viable.

1.15.7 Social Compliance

The MCM team has developed good relationships with local communities as well as regional and national authorities. MCM continues to pursue its aim to make its presence in the region an opportunity for its host community and the country as a whole. The Inchiry region is among the poorest in the country, and as well as providing employment opportunities, MCM is actively involved in community development programs.

1.15.8 Closure Plan

An independent Closure Plan was completed at the end of 2014. The Closure Plan included all environmental liabilities and not only those associated with activities after the Company's acquisition of Guelb Moghrein in 2004.

1.15.9 Project Enhancement Studies

With near-mine infill and extensional drilling commencing in 2016, MCM is actively seeking to extend the life of the Project. The primary aims are to further evaluate the Oriental deposit as well as identify and assess open pit and underground opportunities (both as extensions to the current pit or as satellite projects). A tailings retreatment project is also being investigated and is primarily focussed on tailings from the early phases of mining and processing (i.e. prior to 2012).

ITEM 2 **INTRODUCTION**

2.1 Purpose of this Report

This Technical Report on Guelb Moghrein has been prepared by Qualified Persons, Tony Cameron of Cameron Mining Consulting Ltd (CMC), David Gray of First Quantum Minerals Ltd (FQM), and Andrew Briggs of First Quantum Minerals Ltd (FQM) for FQM.

The purpose of this Technical Report is to document updated Mineral Resource and Mineral Reserve estimates for the Guelb Moghrein Mine, and to provide an updated commentary on the mining and production status of the mine.

2.2 Terms of Reference

The Company has prepared this Technical Report to document updated Mineral Resource and Mineral Reserve estimates, economic evaluations and supporting ancillary documentation associated with the Guelb Moghrein site in Mauritania, North West Africa. The Technical Report covers all mineralisation at the mine and has been written to comply with the reporting requirements of the National Instrument 43-101: 'Standards of Disclosure for Mineral Projects' of the Canadian Securities Administrators (the Instrument) and with the 'guidelines of the Australasian JORC Code (JORC, 2012), which in turn complies with the Standards on Mineral Resources and Reserves of the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM Guidelines, 2014).

This report and the resource and reserve estimates discussed therein represent the results of a culmination of reviews and updates undertaken by FQM. This report supersedes the NI 43-101 Technical Report issued by FQM for Guelb Moghrein and dated March 2008 (Bargmann and Dominy, 2008).

The effective date for this Mineral Resource and Mineral Reserve estimate update is 31st March, 2016.

2.3 Qualified Persons and Authors

Name	Position	NI 43-101 Responsibility
David Gray *BSc (Geology), MAusIMM, PrSciNat(SACNASP)*	Group Mine and Resource Geologist, FQM (Australia) Pty Ltd	Author and Qualified Person Items 7 – 12, 14
Tony Cameron *BEng Hons (Mining), MEngSc, FAusIMM*	Consultant Mining Engineer, Cameron Mining Consulting Ltd.	Author and Qualified Person Items 1-6, 15 and 16, 18 to 28
Andrew Briggs BSc(Eng), ARSM, FSAIMM, PEng (NAPEG)	Group Consulting Project Metallurgist FQM (Australia) Ltd	Author and Qualified Person Items 13 and 17

2.4 Sources of Information

Geology and Mineral Resource sources of information are drilling logged and sample data, blast hole sample data, in-pit geology mapping, as well as the relevant (current) information from the previous Technical Reports on the property.

2.5 Personal Inspections

Authors David Gray, Tony Cameron and Andrew Briggs, each acting as a Qualified Person for this Technical Report, have personally inspected the Guelb Moghrein site on several occasions since 2008, with the most recent visit by David Gray, being in November 2015.

Andrew Briggs, also a Qualified Person for this Technical Report, has visited site numerous times, the last time being in mid 2014.

ITEM 3 **RELIANCE ON OTHER EXPERTS**

The authors of this Technical Report do not disclaim any responsibility for the content contained herein.

ITEM 4 PROPERTY LOCATION, DESCRIPTION AND TENURE

4.1 Project Ownership

The Company currently holds a 100% interest in Guelb Moghrein through its subsidiary, MCM SA (MCM). The Company held an 80% majority interest which it acquired in 2004 until the remaining 20% was acquired in February 2010 from GEMAK SA and General Gold Ltd.

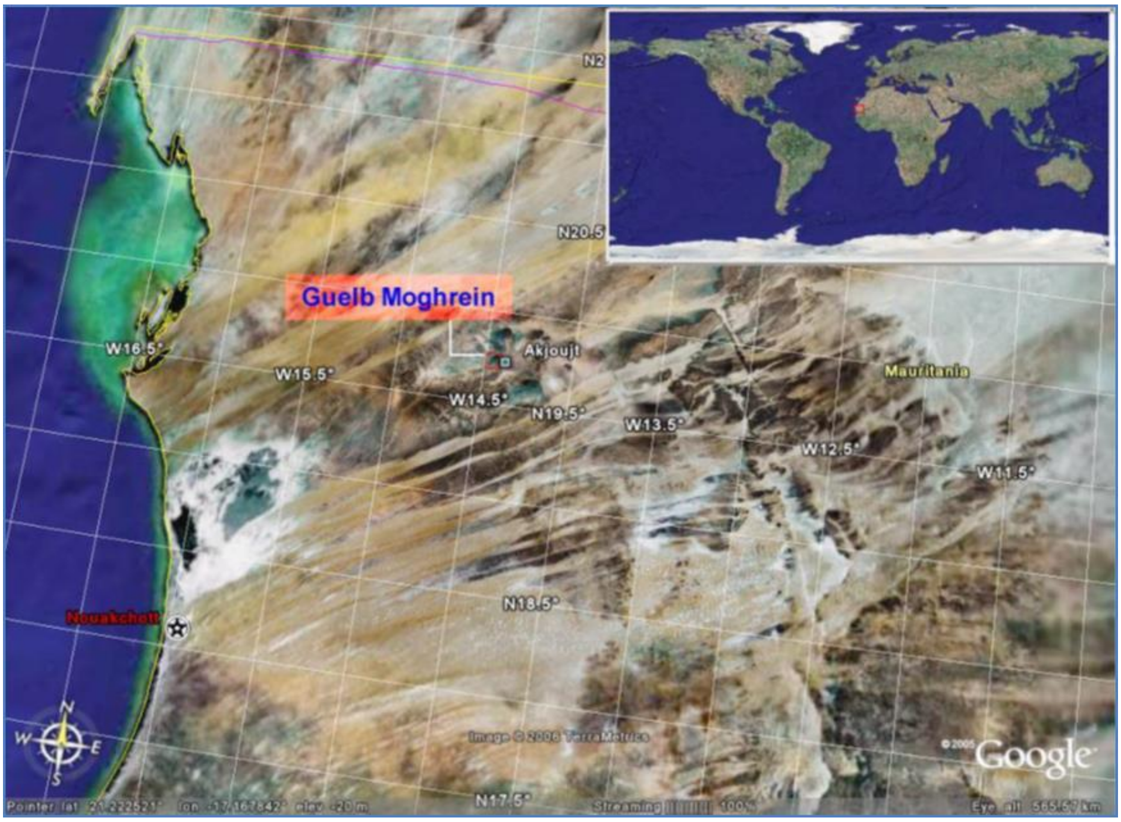
4.2 Project Location and Description

Guelb Moghrein is located 250 km northeast of the nation's capital, Nouakchott, near the town of Akjoujt, and is accessible by paved highway (Figure 4-1). Akjoujt has a population of approximately 11,000 people.

Guelb Moghrein consists of an open pit copper and gold deposit located 141 m above sea level. Mining started in April 2006, whilst commissioning of a copper flotation plant commenced in July 2006 and commercial production began in October 2006. A magnetite processing plant was commissioned during the first quarter of 2015, but subsequently suspended due to prevailing low iron ore process.

The mine provides its own diesel generated electric power. It has developed reliable sources of fresh and saline water from a well field 120 km distant from the open pit. Guelb Moghrein has three tailings management facilities; two of which are still operational for magnetite and magnetite-free tailings.

Figure 4-1 Location of Guelb Moghrein (after Bargman and Dominy, 2008)



4.3 Tenure

The right to mine is mandated by a large scale 81 km^2 mining license (2C2 ex CM2) covering the concession which is valid until December 2042 (Table 4-1). This licence was originally granted to the Société Minière de Mauritanie (SOMIMA), a joint venture of Charter Consolidated (45%), the Government of Mauritania (22%), the International Finance Corporation (IFC – 15%); Penarroya (7%) and the Bureau de Recherches Géologiques et Minières (BRGM) in 1967.

Table 4-1 Coordinates of the 2C2 mining concession; UTM (Zone 28 North)[1]

Titulaire : MCM

Code: 2C2 ex CM2 **Surface:** 81
Nom:
Fuseau: 28 **Carte:** 50. AKJOUJT

fuseau	x:	y:
28	553.000	2.186.000
28	553.000	2.177.000
28	562.000	2.177.000
28	562.000	2.186.000

In addition to the Guelb Moghrein mining concession, the Company holds five exploration concessions in the area totalling 5,581 km^2 either directly through MCM or since 2011 through Mauritania Exploration SARL, an entity wholly owned by the Company.

4.4 Rights and Surface Land Ownership

Guelb Moghrein is regulated by a Convention d'Establishment (the "Convention") with the Government of Mauritania. This Convention was established in 2006 and renegotiated in 2009, receiving approval from parliament in November 2009.

The 2009 renegotiation contained minor updates to the original convention. The main changes were an increase in royalties in line with the Mining Code.

Under the Convention, Guelb Moghrein has unlimited rights to draw water from the Bennichab Aquifer to meet the Project needs. In return, MCM has undertaken to search for, and utilise, local water sources where possible to reduce dependence on the aquifer (Bargmann and Dominy, 2008).

[1] The geographic coordinate system of the property is WGS84 28N which has been converted to a local mine grid with the north axis rotated east by 31.5 degrees. The relative elevation has been adjusted by a 1,000 m addition to the true elevation.

4.5 Royalties, Payments, Agreements

A five year taxation relief period for MCM ended on February 20, 2012. The Company has since paid tax on income at a rate of 25%. A mineral royalty of 3% copper and 4% gold on net sales is payable quarterly.

4.6 Environmental Permitting and Liabilities

In November 2004, FQM acquired the Guelb Moghrein Mine. In a letter dated 22 August 2004 the Government of Mauritania indemnified FQM and MCM from responsibility for any environmental degradation or pollution caused by previous operators of the site. Despite the indemnity, FQM made a commitment to clean-up the mine site where it was practicable and viable. Work to clean-up and rehabilitate the legacy areas from previous owners is described in Item 0.

The most recent environmental impact study at Guelb Moghrein Mine assessed the impact of the proposed magnetite circuit. The EIA was approved by the Mauritanian Government in June 2014.

4.7 Potential Access and Exploitation Risks

No significant factors and risks are known that may affect access, title, or the right or ability to perform work on the property.

ITEM 5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE & PHYSIOGRAPHY

The following information is reproduced from the 2008 NI 43-101 Technical Report (Bargmann and Dominy, 2008). The information remains relevant.

5.1 Topography and Elevation

The topography around the deposit forms a peneplain at around 130 m above sea level (1,130 m elevation on the mine grid), with low hills further to the north. The siliceous gossan which marks the outcrop of the deposit gives rise to two steep hills rising about 80 m and 90 m above the peneplain (JICA, 2006).

5.2 Accessibility

The property is accessed via a 250 km paved road which connects the capital Nouakchott with the town of Akjoujt. A 5 km gravel road connects Akjoujt with the mine site.

Nouakchott has an international airport with regular flights to Europe, and North and West Africa. Port facilities are available at Nouakchott and Nouâdhibou, with the latter being the export facility for Mauritania's iron ore production.

5.3 Climate

The area is situated on the southwest fringe of the Sahara desert and has a desert climate. The weather is generally hot and arid, with summer temperatures regularly exceeding 38°C (100°F) during the day, but is made bearable by low humidity. Sandstorms occur throughout the year but are less frequent during the summer and autumn.

5.4 Sufficiency of Surface Rights

There is more than adequate tenure area to support the location of mining waste dumps, process tailings storage areas and the process plant site.

5.5 Infrastructure

The Guelb Moghrein mine has been in production since 2006. All infrastructure required is in place and currently includes:

- open pit mine
- flotation processing facility
- CIL tailings storage facility;
- waste rock dump and ore stockpiles
- mine workshops and administration building
- two synchronised power generation stations
- explosives mixing plant and storage facility
- accommodation camp with messing facility
- saline and potable water bore field at Bennichab, some 70Km away from the mine
- water storage reservoirs at site

5.6 Availability of Power, Water and Personnel

The Guelb Moghrein mine has its own power station, using heavy fuel oil (HFO) as a fuel source. Water is sourced from the Bennichab aquifer, 113 km to the southwest of the mine site. Water from this source is also supplied to the town of Akjoujt.

Nationals personnel are recruited from throughout the country and from nearby Akjoujt. At the end of 2015, Guelb Moghrein employed 1,082 persons directly and a further 355 contractors.

ITEM 6 **HISTORY**

6.1 Prior Ownership

Copper-made tools and arrowheads dating from approximately 4000 to 6000 BC have been found in the Akjoujt area of Mauritania where Guelb Moghrein is located. Although exploitable quantities of copper were recognized in the 1930s it was not until the 1950s when serious development plans were undertaken. After the nation's independence from France in 1960, companies such as Anglo American Corporation attempted development of the Guelb Moghrein deposit.

In the 1970s an open pit was developed and a TORCO (a high temperature oxide roast operation) commenced but had to close in 1977 due to technical difficulties and high fuel prices. The national mining corporation, SNIM, through its subsidiary MORAK attempted to recover gold. In 1999, after mining law reform, a Mauritanian chartered company (GEMAK) attempted to develop Guelb Moghrein, but did not proceed beyond the production of a feasibility study in 1997.

In November 2004, the Company signed an asset sale agreement, the terms of which included a series of payments totalling $10 million. Site establishment and construction commenced in March 2005. Guelb Moghrein achieved commercial production in October 2006.

6.2 Production History

Mining started in April 2006. Commissioning of the copper flotation plant commenced in July 2006 and commercial production began in October 2006. In October 2009, the mining rate was increased to 3.8 million tonnes of ore per annum at a strip ratio of 3:1. The processing plant was further upgraded during 2014 with the installation of a 5.8MW SAG Mill. The planned processing rate for 2015 was 4.0 million tonnes of ore per annum.

6.3 Previous Mineral Resource Estimates

6.3.1 Resources

For information, the previous Mineral Resource estimates were detailed in the NI 43-101 Technical Report dated March 2008, and are restated in Table 6-1. At the time of reporting these Mineral Resource estimates, FQM had been mining at Guelb Moghrein for two years. These Mineral Resource estimates were determined and written to comply with the reporting requirements of the National Instrument 43-101: 'Standards of Disclosure for Mineral Projects' of the Canadian Securities Administrators (the Instrument) and in turn complies with the Standards on Mineral Resources and Reserves of the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM Guidelines, 2005).

Table 6-1 Guelb Moghrein Mineral Resource estimate as per the March 2008 Technical Report. Resources were reported using a Cu cutoff of 0.75%.

	Classification	Tonnes (Mt)	Cu %	Au g/t	Cu t	Au oz
Sulphide	Measured	12.38	1.59	1.38	196,842	549,277
	Indicated	20.64	1.44	0.93	297,216	617,140
Measured and Indicated		**33.02**	**1.49**	**1.10**	**491,998**	**1,167,780**
	Inferred	2.43	1.36	0.72	33,048	56,251
Oxide	Measured	0.36	2.87	2.41	10,332	27,894
	Indicated	0.01	2.46	1.81	246	582
Measured and Indicated		**0.37**	**2.85**	**2.39**	**10,545**	**28,431**
Total Measured & Indicated		**33.39**	**1.51**	**1.11**	**502,543**	**1,196,211**
	Inferred	0.02	3.09	1.98	618	1,273
Total Inferred		**2.45**	**1.37**	**0.73**	**33,666**	**57,524**

Note: In terms of resource depletion from the March 2008 Mineral Resource estimate to 31st December 2015, and using the same Mineral Resource 0.75% copper cutoff, the mined Resource was 20.6 Mt at a grade of 1.59% Cu and 1.26 g/t Au.

6.4 Production

The following historical production information is summarised from the previous TR and FQM annual reports:

- Between 1954 and 1956 a small plant is reported to have treated 22,000 t of ore sourced from two underground mine levels.
- The main period of production was between 1970 and 1977, during which time 5.3 Mt of oxide ore was mined. A TORCO plant produced 145,500 t of copper concentrate during this period.
- A tailings retreatment project was in operation between 1992 and 1996, recovering 158,000 oz of gold from 1.96 Mt of tailings.
- Between 2006 and December 2015, MCM have mined 160 Mt of material from the pit and processed 25 Mt of ore at an average grade of 1.4% Cu. A total of 329 kt of copper and 553 koz of gold have been produced.

Table 6-2 Summary of Production since MCM Commenced Mining and Processing in 2006

	Unit	Total	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Ore Mined	Mt	29.0	0.4	2.3	3.2	2.7	3.0	3.6	3.6	2.9	3.4	3.8
Waste Mined	Mt	131.3	1.7	5.9	4.3	8.8	9.8	13.2	19.6	22.3	22.0	23.7
Total Mined	Mt	160.3	2.1	8.2	7.5	11.5	12.9	16.8	23.1	25.2	25.4	27.5
Ore Processed	Mt	25.0	0.3	1.9	2.1	2.3	2.8	2.7	3.1	2.8	3.1	4.0
Grade Cu	%	1.4	2.0	1.4	1.9	1.8	1.5	1.4	1.3	1.4	1.2	1.2
Copper Produced	t	329,374	5,031	28,755	33,073	36,608	36,969	35,218	37,670	37,970	33,079	45,001
Gold Produced	oz	553,015	2,746	54,161	61,925	93,352	81,766	62,938	60,519	58,191	30,095	47,322

ITEM 7 GEOLOGICAL SETTING AND MINERALISATION

The geological setting and mineralisation has been detailed within the previous TR. The following is an updated summary thereof.

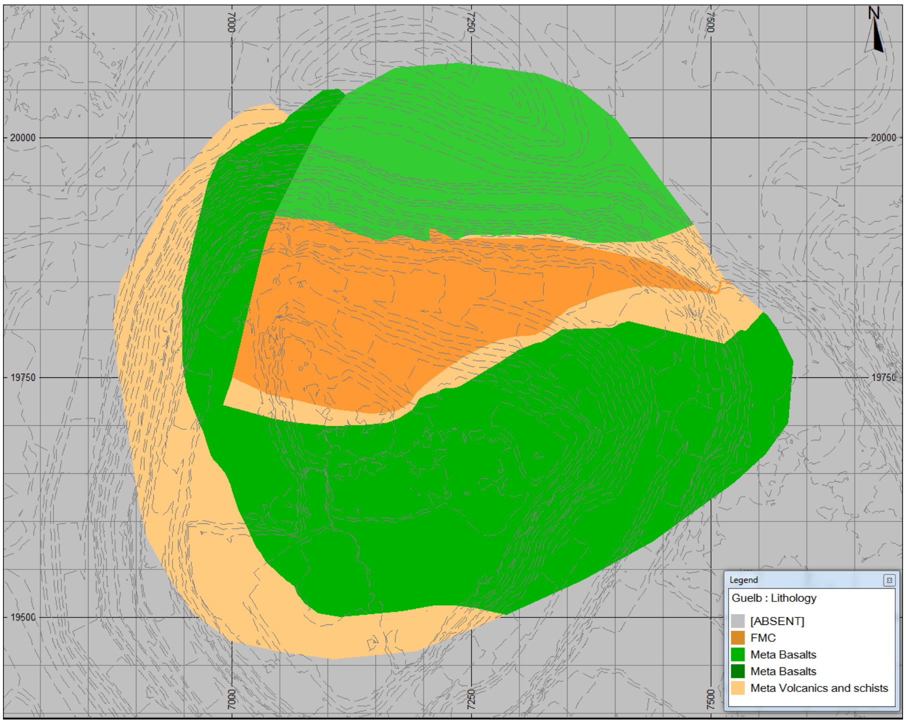
7.1 Regional Geology

Guelb Moghrein is located within the Mauritanides Orogenic Belt which extends along the West African coast from Senegal to Western Sahara. The Mauritanides are considered to be late Proterozoic and the Akjoujt area lies within 30 km of the basal thrust that defines the eastern extent of the Mauritanides. Within the Akjoujt area, the Mauritanides is characterised by a complex set of thrust faulting resulting in several significant unconformaties affecting the local metabasalts and metasediments (volcanics). The mineralised ferro-magnesian carbonates of Guelb Moghrein are believed to be associated with some of the sediments and BIF layers of the Eizzene and Oumanchoueima Groups.

7.2 Local geology

Guelb Moghrein's Occidental and Oriental deposits are hosted in a ferro-magnesian carbonate unit known as the FMC. The FMC unit is bound by thrust fault shearing, which in areas has stacked FMC horizons, resulting in distinctly thicker FMC zones. Structurally this is considered to be part of the D3 structural event which is post mineralisation. The FMC unit has mostly meta-basalt either side of it with mafic schists along the contacts. Further into the hangingwall of the FMC unit the meta-basalts are overlain by mafic and felsic volcaniclastics (Figure 7-1). Metamorphic facies ranges from amphibolite through to upper and lower greenschist facies which are commonly observed in the meta-basalts mineral assemblages.

Figure 7-1 A plan view of pit mapping illustrating key lithologies in relation to the FMC unit.



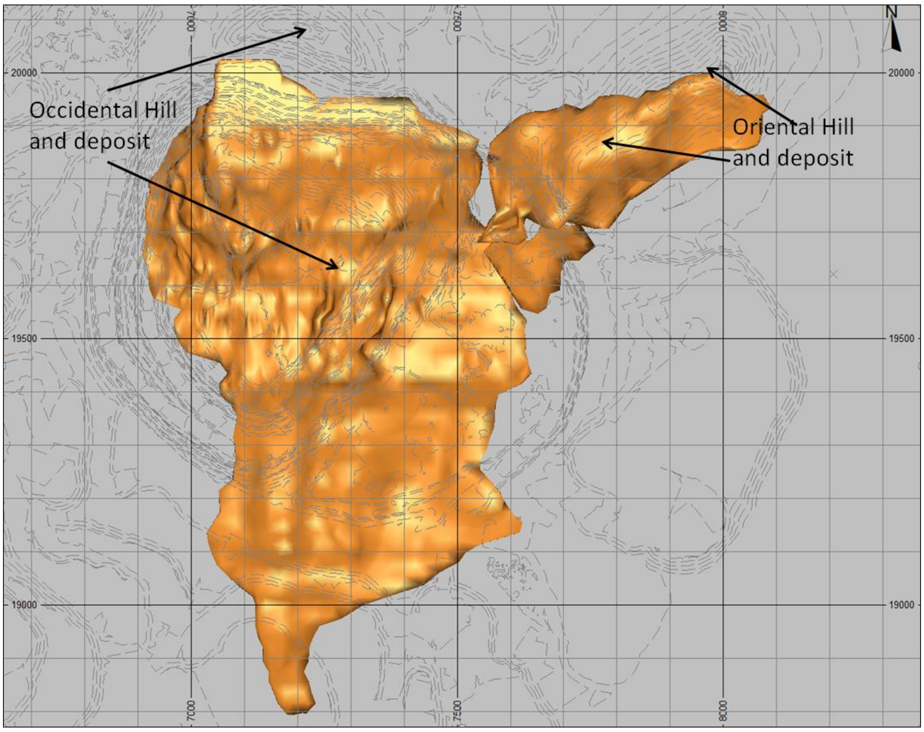
7.3 Mineralisation

The FMC unit is the primary host of Guelb mineralisation and is comprised mainly of chalcopyrite and pyrrhotite within the un-oxidised zone. Other minerals include iron-cobalt-nickel arsenides and bismuth-gold-silver-tellurides. Gold is largely coincident and associated with chalcopyrite.

A shallow (<40 m) oxidised zone has resulted from surface weathering and oxidation of the deposits primary sulphide mineralisation. Commonly, the oxidised zone has minerals such as native copper, malachite, cuprite and chalcocite. Mineralisation of the carbonate units is suggested to be hydrothermal and associated with the D2 deformation event, which was subsequently deformed by faulting and thrusting of the D3 event. The siderite within the FMC is considered to have provided a reactant for the hydrothermal Cu-Au bearing fluids. Sulphide mineralisation is often better developed along the basal portions of the FMC and ranges from semi-massive to disseminated.

The topographic expression of the Guelb Moghrein mineralisation outcrops as two small hills of notable FMC gossans. The two hills are known as Occidental and Oriental, below which mineralisation is located as two distinctly different volumes. Occidental is characterised as a tabular shaped body dipping to the south by approximately 20 degrees and has a strike length of 650 m and dip extent of 1200 m. The width of Occidental mineralisation ranges from a few meters to 10's of meters. In contrast the Oriental deposit is much smaller and is restricted as an ellipsoid shaped body immediately below the Oriental hill. Oriental has a strike length of 500 m and is approximately 200 m wide.

Figure 7-2 A plan view of the 3D volumes of mineralisation for the Occidental and Oriental deposits of Guelb Moghrein



The sulphide mineralisation at Occidental contains the bulk of Guelb Moghrein copper and gold metal and is the still the focus of current mining activities.

ITEM 8 **DEPOSIT TYPE**

The Guelb Moghrein Occidental and Oriental deposits may be classed as structurally modified IOCG deposits. Their diverse sulphide mineral assemblages are distinctive of IOCG deposits which are believed to be the direct result of hydrothermal fluids that preferentially mineralised the iron rich FMC carbonates. The deposits are believed to be structurally modified due to the apparent lack of proximity to any contemporaneous igneous activity. Their association with iron rich carbonates juxtaposed by post mineralisation deformation was a fundamental guide during the exploration phase and continues to guide definition for control on the mineralised volumes. In-pit mapping and continued 3D modelling of the Guelb Moghrein structural framework remains important to robust delineation of mineralised volumes.

ITEM 9 **EXPLORATION**

Apart from sampling associated with ongoing drilling (detailed in Item 10), the following exploration activities were conducted around Guelb Moghrein and its immediate surrounds by the issuer since 2008.

FQM conducted near mine exploration around Guelb Moghrein from 2008 to 2016 with the majority of work conducted between 2009 and 2012. The exploration program targeted ferromagnesian carbonate (FMC) hosted Cu-Au mineralisation, analogous to Guelb Moghrein, in a high strain portion of the Oumachoueima Group rocks immediately adjacent to and along-strike from the mine.

Work included ground gravity and airborne gravity radiometry surveys with the intention of directly detecting the dense FMC host rock as extensions to the deposit and in the surrounding district. The survey clearly delineated the main Occidental and Oriental FMA lenses and identified several lower tenor density anomalies in the district. The most prospective gravity targets were drill tested but returned no significant mineralisation. In addition, several other geophysical studies were completed including:

- Local ground magnetic surveys were completed over most geochemical and geophysical targets, with the aim of better defining the geometry of magnetic FMC bodies.
- Ground magnetic and electrical resistivity surveys around the pit and mine infrastructure areas in 2010 and 2015 have helped to interpret structures targeted for water bore monitoring.
- Downhole EM at the El Joul prospect and around the pit in 2011 was trialled to locate conductive mineralised FMC. Targets at the time were not compelling enough to drill.
- Petrophysical measurements on a selection of 39 core samples confirmed the high conductivity and magnetic susceptibility of the ore and the FMC in general, but at the same time returned much lower chargeability for ore samples than for barren FMC. The ore and FMC do not have the highest seismic velocity Vp relative to all other rock units, although their densities are far greater than any other units.
- Satellite aerial photographs (e.g. Worldview 2) have been acquired on an almost yearly basis since 2009.

In addition, a 200 m to 500 m spaced multi-element soil geochemistry survey was conducted across the extent of the Oumachoueima Group rocks surrounding the mine. The survey proved effective at mapping geology and identifying anomalous concentrations of Cu, Au, As and other elements in the soil. Numerous geochemical anomalies were identified and subsequently prioritised for drilling by geological mapping and ground magnetic surveys. Drill testing of these anomalies returned only minor grades of Cu-Au mineralisation in the bedrock.

Detailed geological mapping of the area surrounding the Guelb Moghrein Cu-Au deposit was conducted at 1:2000 scale. The mapping identified critical ore-controlling structures and lithologies and enhanced the understanding of the deposit. Subsequent drill-testing of these targets demonstrated inconsistencies between the geology that is observed at surface and that which is present in drill holes.

Pit-mapping and near-mine mapping together with re-logging of existing drill core has identified several potential pit extensions which were investigated by drilling. Drilling at Oriental hill, immediately east of Guelb Moghrein, demonstrated the presence of a large mineralised FMC body which was largely oxidised. Several drill holes immediately adjacent to the pit walls effectively closed-off the mineralisation to the east and west; to the north the mineralised FMC has been eroded away or ‘skies-out’; and to the south the Cu and Au grades rapidly diminish with increasing depth of the FMC.

A Reverse-Circulation lithogeochemistry drilling program involved the drilling of a 1000 m spaced grid of holes to characterise the hydrothermal ‘footprint’ of the Guelb Moghrein deposit. The program demonstrated that the deposit has a strong Cu-Au-As-W association. There is a strong Albite halo (sodium enrichment) to the deposit in the order of 2-3 kilometres in extent.

Protocols for all exploration geochemical and drill hole sampling at Guelb Moghrein are carried out in accordance with a detailed site procedure covering sampling methodology and QAQC. This includes routine insertion of standards, blanks and duplicates with all laboratory submissions. Samples are prepared on site under supervision of the independent laboratory services supplier, before being despatched for analysis at the registered laboratory in Johannesburg or Vancouver.

ITEM 10 DRILLING

Since discovery, the Guelb Moghrein copper-gold deposit has been drilled using conventional diamond and reverse circulation drilling methods. More recently, with mining, blast hole drilling has added close spaced detail to the existing diamond and reverse circulation drilled grid. The overall drilling approach has been to define ore body extents with follow-up infill drilling as required to support geological detail, the rate of mining and prevailing mine design for defining Mineral Reserves. The drill grid spacing ranges from around 5 m to 20 m in the active mining areas and is between 70 m to 100 m in unmined Mineral Resource areas. This report focuses on the drillholes drilled since the previous TR and that are within 1 km of the Guelb Moghrein deposits.

The reader is referred to the previous TR for details regarding drilling prior to 2008. Infill and extensional drilling continued from 2008 by the issuer across the Guelb deposits. This drilling has focussed on defining the Oriental deposit as well as for providing detail across the Occidental deep areas.

The QP, David Gray, notes that all historical and recent drillhole data, including all grade control drilling data has been consolidated (October 2015) into a single Guelb Moghrein SQL database which uses DataShed software as a front end system. This consolidation process has focussed on ensuring consistent data and format with improved security and quality of drillhole data as per FQM's Group standards. Verification and validation of historical data has taken place and old maps and plans were utilised to verify the position of holes.

Pre-1990 (diamond drilling completed by SOMIMA), the downhole survey and source of collar survey data were limited. Literature reviews identified that these holes were drilled vertically with exception of C26 and C27 which were drilled at 70 degrees at Oriental hill. The updated database reflects this information. In addition, the QC has verified that these collars match the topography surface data and that geology and sampling data are aligned with surrounding holes. Diamond holes drilled by MCM (between 2008 and 2013) across Oriental Hill used an inaccurate topography elevation. These holes collar coordinates were correctly elevated to match the latest Oriental hill surface survey data. Recent deeper vertical drilling has not detected significant downhole deviation. This supports a low risk of incorrectly coordinated data for deeper vertically drilled historical holes which had limited survey data. No other risks were noted apart from drillhole AB4.5, whose mineralised intercept was deeper than surrounding holes and was removed from the data. Since 2008, downhole surveys were completed using the Reflex multi or single shot digital down-hole instrument which recorded the hole's dip, azimuth, temperature and magnetic susceptibility. Measurements were taken approximately every 50 m down the hole and data was manually transferred into an excel spreadsheet template for uploading into the database.

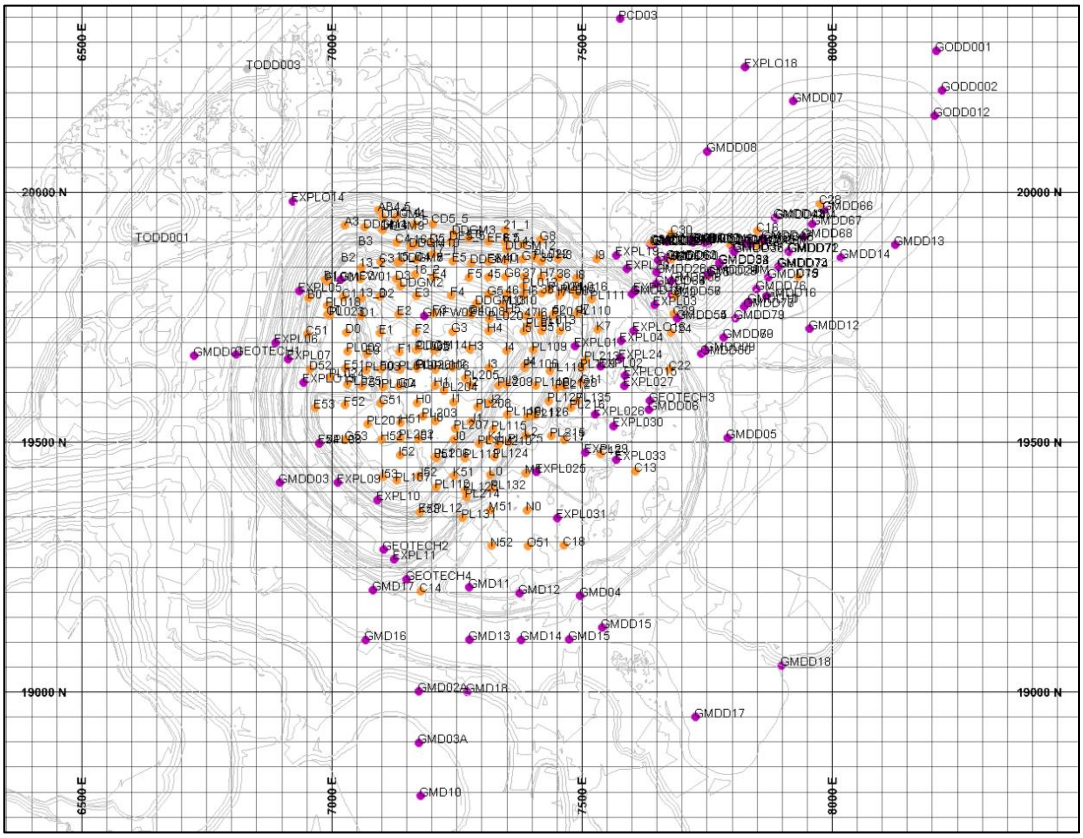
10.1 Diamond core drilling

Approximately 208 diamond holes were drilled from 1968 through to 2008 and were the subject of the previous TR. Half of these holes were drilled between 1968 and 1973 by SOMIMA with the remaining diamond holes drilled by GGI and MCM. Significantly, 8 holes were completed in 2006 by MCM as a twin hole program used to verify historical (pre-1990) drilled results. These holes were drilled across the extents of the Occidental mineralisation and therefore represent good coverage of mineralisation and the historical data. No risks were noted for the historically drilled holes apart from highlighting some short range variability in mineralisation to waste contacts.

From 2008 on, a contract diamond drill rig coring to HQ size was used. A total of 138 holes for 27,228 m were drilled between 2008 and October 2015 (Figure 10-1). Four holes (1,020 m) were completed in 2011 for geotechnical logging in order to improve understanding of pit slope stability. The 138 diamond drilled holes have focussed on the deeper extents of Occidental and on defining the extents of the Oriental deposit.

Drilling was managed by FQM exploration and mine personnel. Holes were drilled, logged and sampled according to FQM Group standards with deviations introduced by the mining team to cater for developing mine systems. The resulting data variances have been standardised in the recent database consolidation exercise of October 2015. Core logging has recorded relevant data including, rock type, weathering and oxidation, alteration, texture, structure, stratigraphy and detail relevant to styles of mineralisation. Data was recorded by hand and then transferred into an excel spreadsheet template used for uploading into the database. Core photography, prior to sampling, was completed for each hole.

Figure 10-1 Diamond drilled holes highlighting holes drilled since 2008 (magenta).

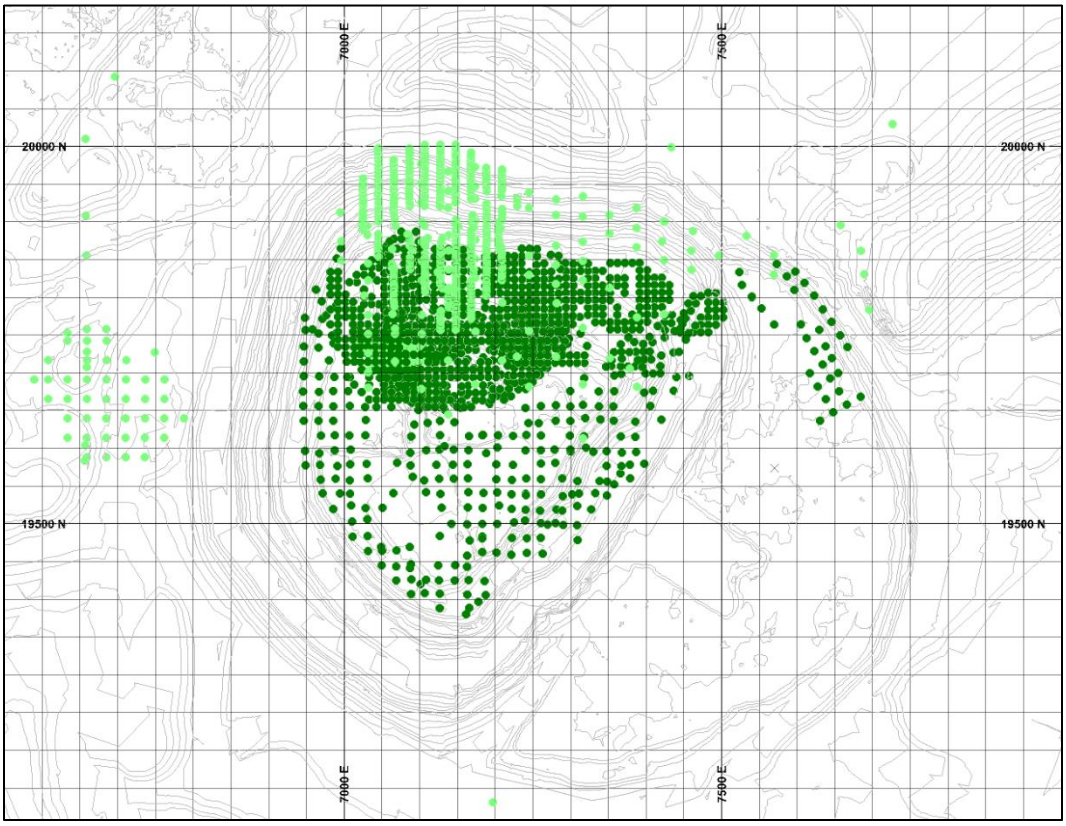


10.2 Reverse circulation drilling

Reverse circulation (RC) drilling was used during various stages of mining for grade control. Historically (circa. 1997), a series of 314 RC grade control holes were drilled within the upper oxide zones of the Occidental deposit. With most of this upper oxidised zone mined out, these holes provide little value to this resource estimate apart from continuity in mineralisation.

Since 2008, 1252 RC holes (for a total of 57,028 m) were drilled within the pit for grade control purposes and ranged from 6 m to 150 m deep (Figure 10-2). 29 RC holes (2,518 m) were drilled by the exploration team as an infill downhole magnetic susceptibility program but were not sampled. 5 RC holes (for a total of 592 m) were also drilled for metallurgical test work.

Figure 10-2 RC drilled holes highlighting holes drilled since 2008 (dark green).



RC drilled cuttings were sampled each metre, with a small sieved portion retained for chip logging of rock type and where possible alteration and mineralisation was also recorded. The bulk samples were weighed at the on-site sample preparation facility and sample numbers and intervals were handed over to the geologist recording the database data.

10.3 Blast hole drilling

Blast hole drilling has continued in the pit with the sole purpose of blasting. However, during periods where reverse circulation drilling was not employed for grade control purposes, blast hole cones were sampled and analysed for the purposes of delineating ore and waste for mining. Blast hole chips are collected in a square metal tray (1 – 2 kg) for every 3 metres of drilling and are numbered and transported to the on-site sample preparation facility. Sample numbers and intervals were handed over to the geologist recording the database data. Blast hole samples were analysed using a hand held XRF, but were not used in this estimate due to risks in data quality.

ITEM 11 **SAMPLE PREPARATION, ANALYSES AND SECURITY**

The QP, Mr David Gray has investigated and verified the sample preparation, sample storage and security practices during his recent site visit and through historical data review. The sampling process was deemed appropriate for the analytical techniques employed. The respective laboratory analytical techniques used for analyses of the prepared samples were similarly deemed as adequate for the purposes of this Mineral Resource estimate. Database data, QAQC results, geostatistical analysis and comparison of different generations of sample data highlighted very few risks to data quality or the representative nature of sample results. The sample data was believed representative of the prevailing styles of mineralisation and therefore suitable for use in this Mineral Resource estimate update.

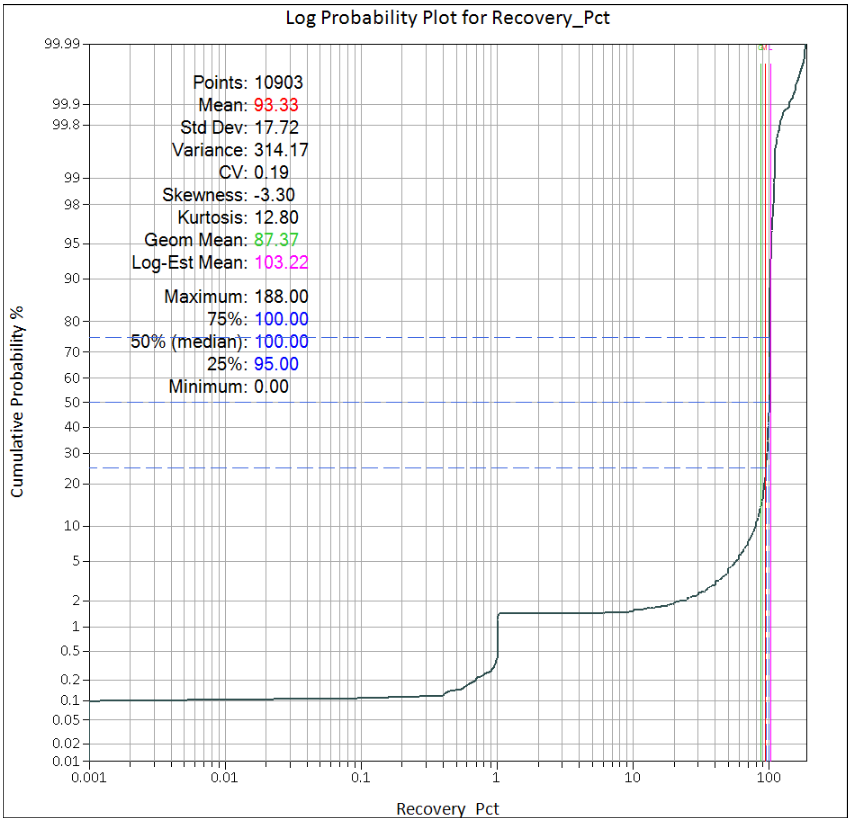
Sample preparation and analytical methods discussed herein relate to the drilling, sampling and analysis since the previous TR. Sampling, analysis and security of results prior relevant to the previous TR are summarised, but for a detailed description of sample preparation, analysis and security pre-2008, the reader is referred to the previous TR.

11.1 Diamond drilled core sampling

Diamond drilling was completed with HQ sized core which was transported to the on-site preparation facility where it was logged and marked out for sampling. Sample intervals were generally between 0.4 m and 1.5 m with sampling across geological boundaries avoided. A diamond saw cut line was marked on the core prior to cutting. This line used the core orientation line as a guide and was offset by 2 cm to the right hand side looking down the hole. The left hand half core containing the core orientation line was retained in the core tray for logging and reference purposes.

85% of drilled core had a recovery above 90% (Figure 11-1). Average core recovery was 93.3% with poorer recoveries restricted to shallow weathered horizons. Core recovery is therefore deemed appropriate and does not impact upon the representative nature of samples.

Figure 11-1 Recovery of diamond drilled core since 2008. 85% of drilled core had more than 90% recovery.



11.2 Reverse Circulation sampling

A bulk sample was collected at the RC drill rig by a mounted cyclone for every metre drilled. Samples were collected in pre-labelled bags together with a permatag placed in each bag. Sampling started from approximately 6 m down the hole and continued through the zone of mineralisation by an additional 6 m. Hangingwall and footwall waste zones were often sampled using 2 m lengths. Cyclone split samples were riffle split to reduce sample mass to between 2 – 4 kg and to ensure samples were still representative. The occasional wet sample was allowed to dry prior to riffle splitting.

11.3 Sample preparation and analysis

Samples were prepared at the on-mine ALS Chemex laboratory and preparation facilities. The cut core and RC chip samples were oven dried and then crushed to P70 passing 2 mm. Crushed samples were pulverised to P90 passing 75 µm. A pulp of 1 kg and 100 g for gold and copper were split respectively and submitted for analysis. Prepared samples were sent to ALS Minerals laboratory in Johannesburg, South Africa for analysis. The ALS Minerals laboratory in Johannesburg is an internationally accredited ISO/IEC 17025:2005 laboratory and is entirely independent of the issuer.

Elements were analysed using a four acid digest followed by an ICP analysis or an AAS analysis. Gold was analysed using AAS. Copper, arsenic, cobalt, silver, iron and sulphur were analysed using ICP. All samples were analysed for copper, gold and arsenic. The Oriental samples were also analysed for single acid soluble copper and cyanide soluble copper using an ICP instrument finish. Some samples, having elevated copper grades were analysed for cobalt, silver, iron and sulphur. In addition, a selection of samples, representing geological intervals, was measured for density using gravimetric methods. Grade control blast hole samples were prepared on mine and were analysed using a hand held Niton XRF or were sent off-site to SGS – Analabs laboratory in Kayes, Mali.

11.4 Quality Assurance and Quality Control

A comprehensive QAQC analysis was completed by CSA Global (UK) Ltd (CSA) in 2012. Results highlighted that sample preparation and analysis may be accepted to be providing representative results of the in-situ mineralisation. A degree of mis-labelling of standards and associated manual data handling was noted, but not deemed as a risk to the representative nature of sample values.

For the sampling completed since the previous TR, standards or certified reference materials (CRM's) were inserted every 33rd sample. Duplicates and blanks were inserted for every 20th sample. Sample bags were pre-numbered to include QAQC samples which ensured that QAQC inserts were blind to the laboratory. QAQC blanks had limited to no evidence for contamination and standards, where correctly labelled, suggest accurate results. Standard and blank deviations were noted and are most likely due to mis-labeling.

Duplicate (field and pulp duplicates) results support good precision (Figure 11-2 and Figure 11-3) for copper, but poorer precision for gold (Figure 11-4 and Figure 11-5) which is largely due to low detection limit values and the fact that two different analytical techniques (4A_ICP and AAS) were used. The lack of umpire duplicates is noted and recommended for any future infill or extensional drilling.

Figure 11-2 A HARD plot of diamond drilled coarse crush duplicates illustrating good precision results for copper analysis

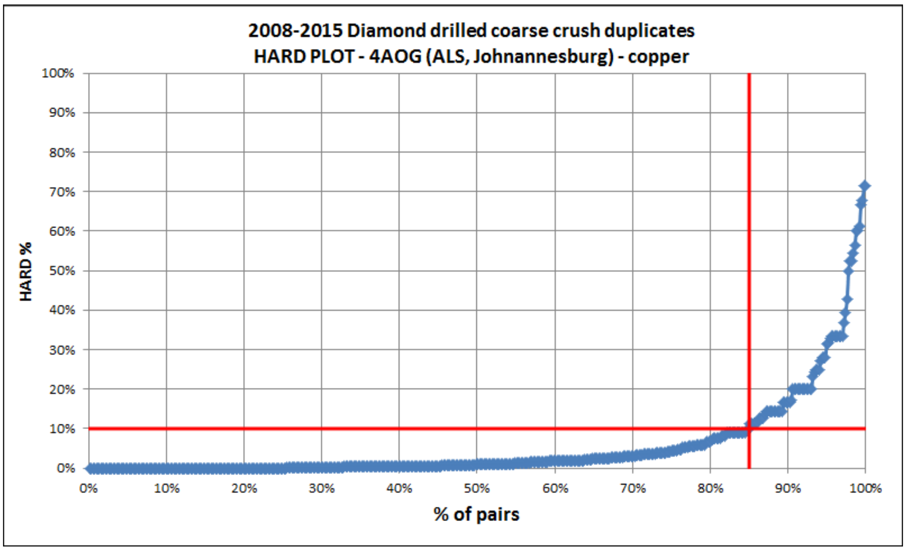


Figure 11-3 A HARD plot of diamond drilled pulp duplicates illustrating good precision results for copper analysis

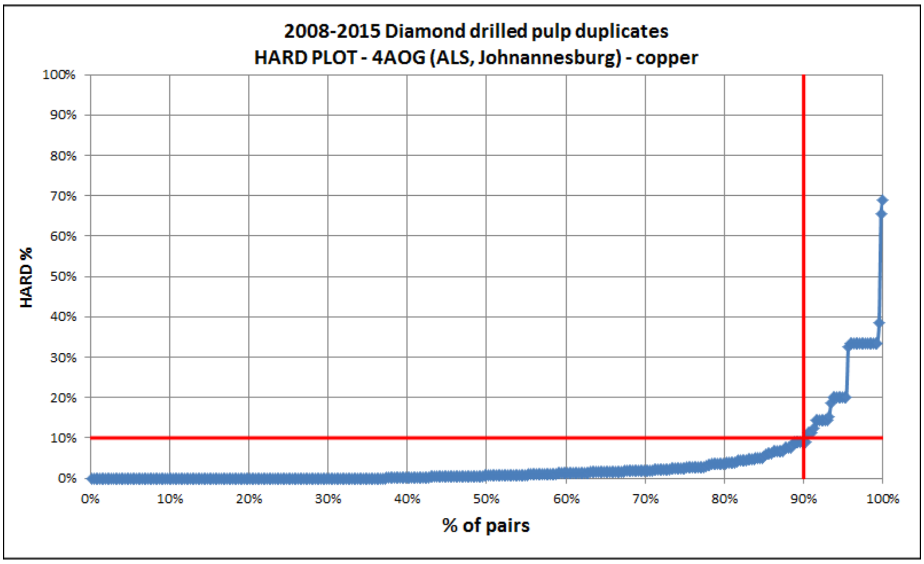


Figure 11-4 A HARD plot of diamond drilled coarse crush duplicates illustrating moderate precision results for gold analysis

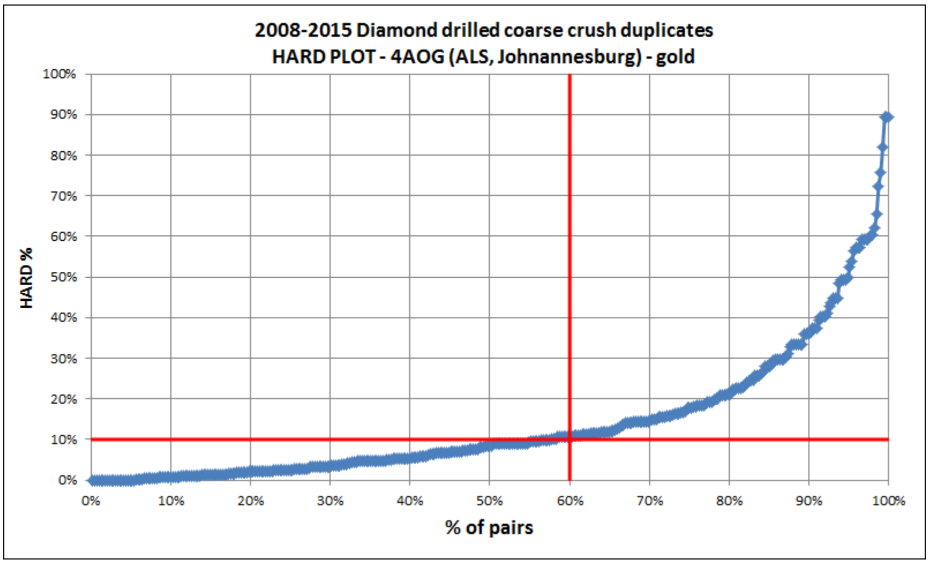
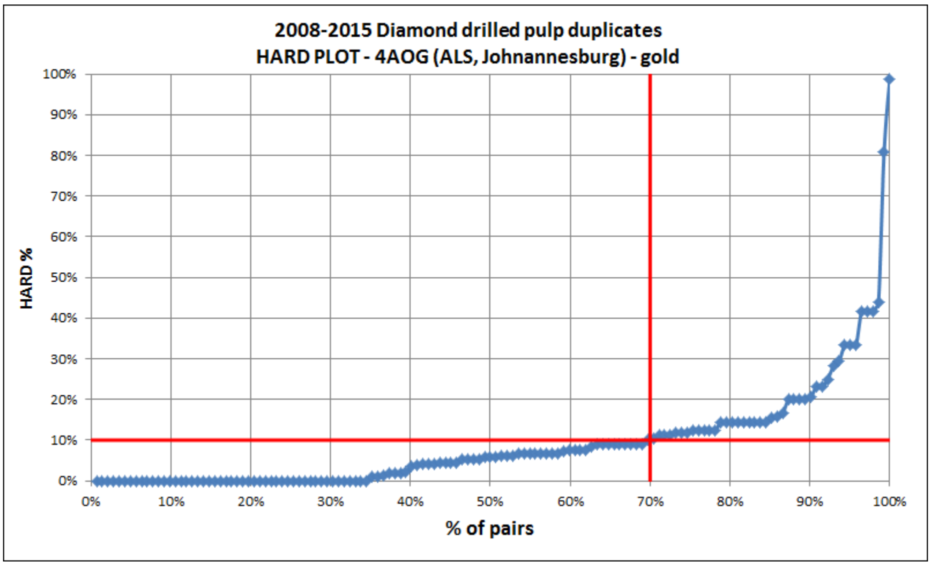


Figure 11-5 A HARD plot of diamond drilled pulp duplicates illustrating reasonable precision results for gold analysis



A comparison of the Cu grades from diamond and RC drilling completed before 2008 (Historic) and after 2008 was undertaken to assess any evidence of material differences or potential biases between these data sets. Aside from the 6 holes drilled for twinning in 2007, which were analysed by Snowden in the previous TR, there is no other close spaced or twinhole drilling. As such a set of "twinned" drilling data was prepared using the following approach:

- The desurveyed Guelb drillhole file was clipped using the mineralisation wireframes to exclude "waste" samples.
- Samples with lengths less than 0.5 m or greater than 2 m were removed.
- The PL series of twin drillholes completed in 2007 was excluded.
- Samples with grades less than 0.08% Cu or greater than 5% Cu were excluded to focus on mineralisation.
- Data was flagged in terms of pre or post 2008 (Historic or FQM).
- The post 2008 samples were formatted as a block model with each sample represented by 0.2 by 0.2 by 0.2 m block.
- The historic drilling data was "estimated" into the FQM drilling block model using a nearest neighbour approach and a search ellipse with the axis lengths of 50 m by 50 m by 2 m (X, Y and Z directions respectively).

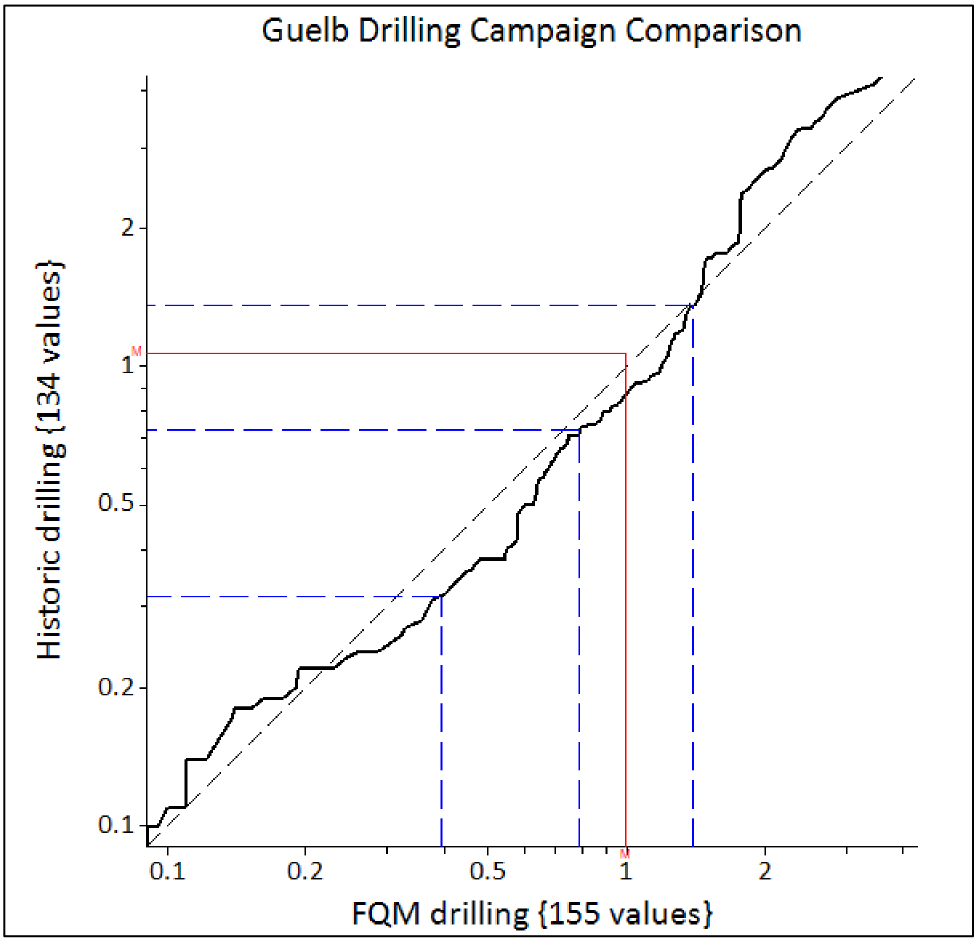
Samples were paired by block and the same search ellipse area. Cu grades from the two time periods were checked visually to ensure the pairs of holes covered similar vertical extents. Resulting holes of the selected twinned samples are listed in Table 11-1.

Table 11-1 Diamond drillhole identities from which twinned samples were selected for comparison

Company	Hole numbers
Historic (Pre 2007)	B0, C11, C12, C17, C51, G0, G51, H0, H2, H51, I2, J52,
FQM 2008 to 2013	EXPL02, EXPL033, EXPL05, EXPL29, META4RC, METD4RC, METE2RC, METF2RC

A QQ-Plot of the two sets of drilling data is shown in Figure 11-6. The inter quartile values and global means for both data sets are similar with the QQ-plot line trending along the 45 degree axis. While some differences do exist particularly for Cu grades between 0.2% to 0.8% there is no evidence of any significant systemic biases.

Figure 11-6 A QQ plot of twinned samples from pre and post 2008 drilling. Post 2008 drilled samples were added for this resource estimate.



ITEM 12 **DATA VERIFICATION**

The Qualified Person, David Gray, visited Guelb Moghrein in November of 2015. During this visit and subsequent studies including this resource estimate, the QP has gained good familiarity and confidence in the available diamond and reverse circulation drillhole data, the geology models and understanding of the prevailing mineralisation. Mr Gray believes the geological understanding and data available for this Mineral Resource estimate update is of good quality and is representative of the prevailing mineralisation relevant to the deposit.

In addition, the previous TR has documented several reviews (database data, QAQC, twin hole drilling results and a coarse gold study) and verifications of the historical data. Findings of this work supported the use of the historical data for Mineral Resource estimates.

Several verifications are hereby confirmed by David Gray.

1. Diamond and drillhole collar coordinates were verified through visual observation and digital checks against database data and topography wireframe surfaces.
2. Sampling methods and data correspond to visual inspection of samples taken from stored core and samples and are correctly represented against the original sample sheet records and the stored database data.
3. QAQC data was investigated together with the process used for analysis and were verified as robust for assuring assay accuracy, precision and controlling contamination.
4. In-pit observations served to verify the prevailing geology and its association with the different styles of mineralisation as per the logged data and 3D geology models.
5. Reconciliation processes have developed since mining start-up. Reconciliation results and final metal products have served to verify the accuracy of the Mineral Resource and Reserve estimation process.

As an operating mine, reconciliation data supports results for the Mineral Resource, Mineral Reserve and grade control models. It is the Qualified Person’s opinion that the data used for this Mineral Resource estimate update is adequate for the purposes used in this technical report.

ITEM 13 **MINERAL PROCESSING AND METALLURGICAL TESTING**

13.1 General

The Guelb Moghrein plant was commissioned in October 2006 as a 2 Mtpa crushing and copper floatation circuit. A gold carbon in leach (CIL) circuit including a regrind circuit were commissioned in March 2008. The plant was expanded twice between 2009 and 2013 to the current 4 Mtpa process capacity. A magnetite separation plant was also added in 2014. The cost of running the CIL plant when compared to the additional gold recovery achieved were found to be too high and the iron ore price dropped significantly in late 2014. Hence, currently the CIL and the Magnetite plants are not being run.

13.2 Metallurgical Tests

Results from three sets of studies were used to assist the development of the flowsheet for the current project, namely:

- Charter Consolidated Services Limited (Charter), 1973: included laboratory and pilot tests carried out on both core and bulk samples of ore.
- KSLE, 1996-1997: included laboratory and pilot tests on both core and bulk samples of ore.
- IML, 2004: included a programme of comminution and flotation testing carried out in Perth.

Results of the mineralogical studies carried out as part of these tests were used by Snowden in the 2008 Technical Report and subsequently form the basis of the summary on Mineralogy in Item 7 of this report. The metallurgical studies included comminution, flotation, gravity concentration, leaching and solid/liquid separation testing.

13.3 Process Plant Design

Based on the results of previous metallurgical testing, MDM produced a proposed concentrator design based on established technology. The process flowsheet consists of:

- crushing and ore stockpiling
- grinding
- flotation and gravity concentration
- cyanide leaching
- concentrate dewatering
- tailings discharge
- reagent mixing, storage and distribution
- water and power supply
- other services.

Some of the key design parameters that were used for production planning and cost estimation during the feasibility phase are summarised below:

- a plant capacity of 2.0 Mtpa was selected
- mill availability of 91.3%, equating to a mill feed rate of 250 t/h;

- average feed grades of 1.82% Cu and 1.43 g/t Au;
- maximum design feed grades of 2.17% Cu and 2.19 g/t Au;
- minimum concentrate grade of 25% Cu;
- 85% copper recovery at an average feed grade of 1.82% Cu;
- 60% recovery of gold by flotation;
- an additional 15% of gold to be recovered by leaching of cleaner scavenger tailings and gravity concentrate obtained from the flotation tailings;
- Details of the plant design, production forecasts, and cost estimates are given in the Project Engineering Report referred to above (MDM, 2004).

13.4 Operational variations

As the project has matured there have been improvements in operation along with further changes in the feed characteristics. By the end of 2015 the various operation parameters detailed above which are summarised below;

- The average feed grade for Au is 0.84 g/t and is approximately on a 0.7:1 ratio with the Cu grade with the Cu grade at approximately 1.22% Cu;
- The optimal Cu concentrate grade is 22.5% however in practice this figure is in a range between 21.5% – 22.5%;
- Cu recovery is averaging 91.7%;
- Overall Au recovery is averaging 60% with approximately 44% recovery from flotation and 16% from gravity.

To improve the overall gold recovery changes to the circuit have seen the introduction of a 48 inch Knelson centrifugal concentrator in the ball mill grinding circuit along with two Falcon centrifugal concentrators in the vertimill regrind circuit. In 2014 the installation of a new SAG Mill has seen the throughput increase from approximately 375tph to approximately 500tph during which time there was also a slight decrease in the feed grade. However, due to addition of a column cell to supplement the final cleaner and produce final concentrate it has been possible to maintain overall Cu recovery. This has been achieved by optimisation of various flotation reagents and minor changes to the flotation circuit/operating philosophy. Namely, the changing from running the rougher flotation bank previously in closed circuit to operating them in open circuit with the tailings going to final tails along with the scavenger tailings.

The results of a recent gold deportment analysis are summarised in the following points:

- 99.5% of the gold occurs as discrete mineral phases.
- Electrum carries 91.7% of the Au.
- The remaining phases included Ag-Te that may contain low levels of Au, Au, Te (most likely sylvanite), Au-Bi (most likely maldonite) and native, Au.
- Only 0.5% of the Au is present in solid solution in arsenopyrite and cobaltite. No Au occurs in solid solution in chalcopyrite or cubanite.

- The Au distribution by size is bimodal occurring as fine inclusions much less than 10µm or as discrete grains of electrum measuring ~25-40µm.
- The 32.5% of the Au occurring as fine inclusions are distributed as follows:
  - 19.6% of the Au occurs in magnetite,
  - 7.8% of the Au occurs in sulphides (chalcopyrite, pyrrhotite, arsenopyrite, cobaltite)
  - 5.1% of the Au occurs in carbonates.
  - The 67.5% Au occurring as ~25-40µm grains of electrum is either liberated or locked with arsenopyrite and cobaltite.
- Au that can be targeted for recovery with gravity and flotation includes the 67.5% occurring as ~25-40µm grains of electrum and most of the 7.8% of the Au that occurs with sulphides totalling approximately 75%.

13.4.1 Conclusions

In conclusion, the modifications to the copper processing plant at Guelb Moghrein since commissioning have resulted in the following improvements:

- increase in plant throughput from 2Mtpa to 4Mtpa, with throughput sustainable for the hardest ores
- copper recovery improved from 85 to 92%, despite a fall in head grade from 1.82% Cu to 1.15% Cu
- gold recovery improvements from 40% in flotation concentrate alone, to 55% in flotation concentrates and 65% overall recovery
- reduction in arsenic content of concentrates from about 4,000ppm to less than 2,500ppm
- control of the negative impacts of fibre within the circuit

Development work continues on site, with particular emphasis on:

- further improvements in gold recovery
- upgrading of flotation concentrates from 22.5% Cu to above 25% Cu
- milling circuit optimization to try and reduce losses of values in the coarse and fines in the cyclone overflow stream

ITEM 14 **MINERAL RESOURCE ESTIMATES**

14.1 Introduction

This Mineral Resource estimate update was prepared in March 2016 by the Qualified Person, Mr David Gray, together with assistance from the Guelb Moghrein mine personnel. Grade estimates were interpolated into a 3-dimensional (3D) geology block model using ordinary kriging and commercially available software packages (Datamine Studio version 3.0 and Snowden Supervisor version 8.3). The project limits and coordinates were based upon the WGS84 28N geographic coordinate system which was converted to a local mine grid where the north axis was rotated east by 31.5 degrees. The relative elevation was also adjusted by adding 1000 m to the true elevation. The deposit was delineated mostly with vertically drilled holes, but several fences of angled holes have been drilled in specific areas for improving understanding of structure and ore body orientation. Drill holes were spaced at close to 30 m intervals throughout most of the upper half of the deposit whereas in the central and deep areas of the deposit they were variably spaced at 50 m to 100 m intervals.

The resource estimate used an updated database as at 16 October 2015 which included all drill hole sample assay results, blast hole sample results together with an interpretation of the geological model that relates to the spatial distribution of copper mineralisation. Datamine software was used to format the drillhole data into coordinated 3D space (a process known as desurveying). Interpolation parameters were based upon the geology, styles of mineralisation, drill hole spacing and geostatistical analysis of the data. Mineral Resource estimates were classified according to geological continuity, QAQC, density data, drillhole grid spacing, grade continuity and confidence in the panel grade estimate and have been reported in accordance with the guidelines of the Australasian JORC Code (JORC, 2012), which in turn complies with the Standards on Mineral Resources and Reserves of the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM Guidelines, 2014).

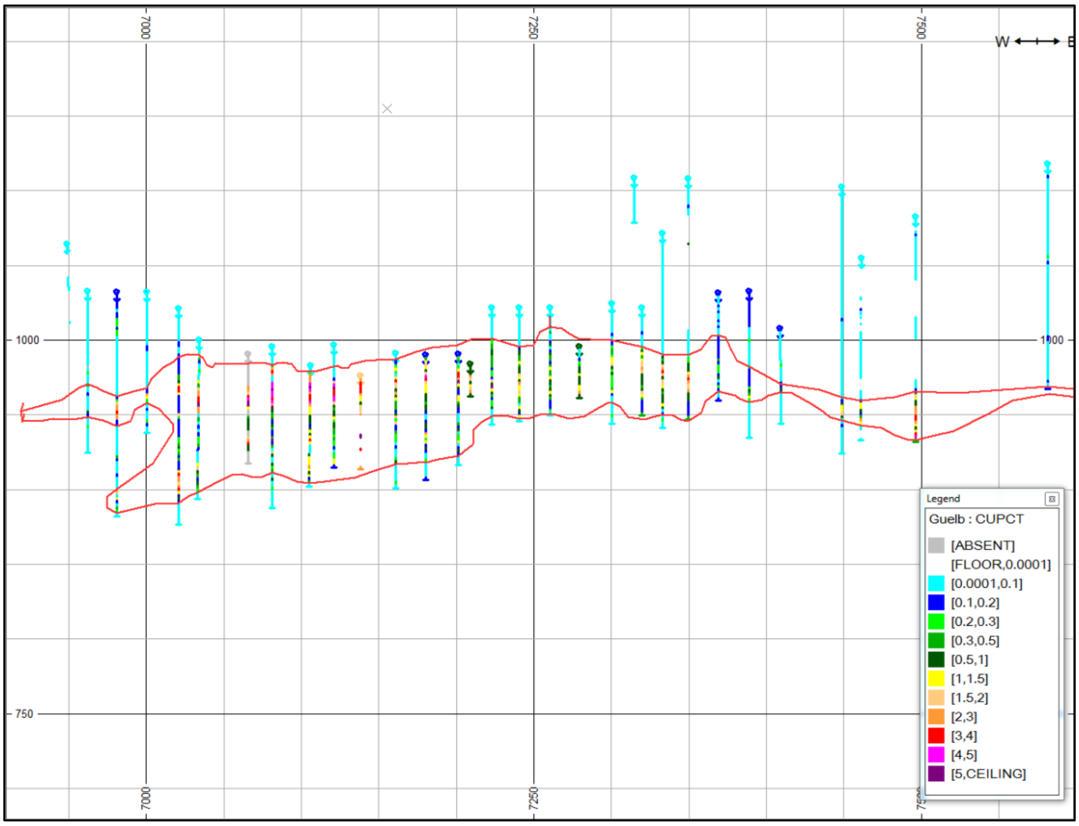
14.2 Geological and Mineralisation model

The Guelb Moghrein deposits are IOCG deposit styles that despite mining are still partly exposed on surface. Sulphide mineralisation dominates and is comprised mainly of chalcopyrite and pyrrhotite. On average, mineralisation within 40 m from surface has been oxidised through weathering, forming typical oxide minerals such as native copper, malachite, cuprite and chalcocite. The mineralisation is hosted by a coarse grained ferro-magnesian carbonate unit known as the FMC. Magnetite becomes more abundant external to the sulphide zones as well as in the more oxidised volumes. Gold coincides with the chalcopyrite sulphide mineralisation.

The deposit's mineralisation is strongly confined to the FMC unit. FMC mineralisation has resulted from several phases of structural deformation and metamorphism and is bound by upper and lower shear zones. The unit is characterised internally by variable sized lenses of FMC that are roughly parallel to the bounding shears. Structural deformation has therefore also created considerable variation to the shape and volumes of higher and lower grade mineralisation within the FMC unit.

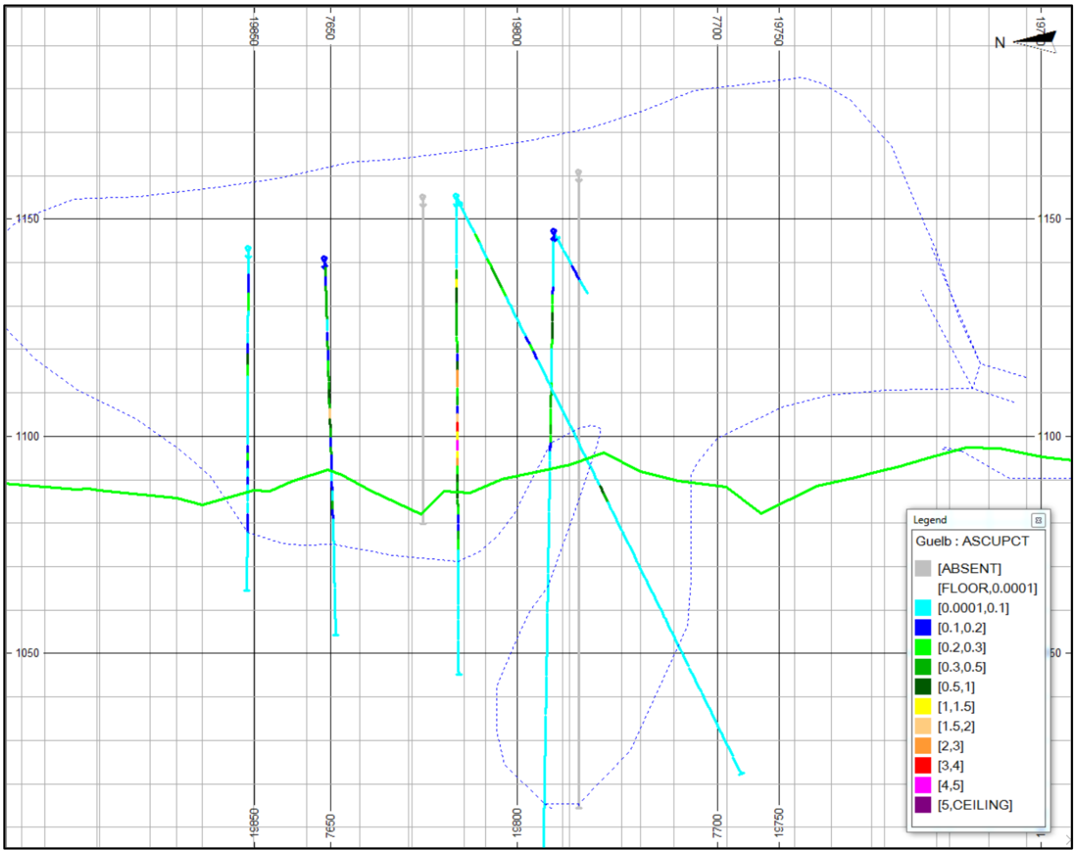
Three-dimensional wireframe volumes for the FMC mineralisation were interpreted across the Occidental and Oriental deposits. Each deposit's mineralisation was identified in the drillhole data and defined using a string envelope digitised on each consecutive vertical section as per the available drill grid spacing. Geology logging of FMC together with a total copper (Cu) mineralisation cut-off of between 0.1 to 0.2% Cu was used to guide the position of string envelopes. The boundary between mineralisation and waste is notably sharp. As a first pass to defining the mineralisation volume, string envelopes were interpreted for vertical sections along the true dip orientation. Thereafter, vertical sections along the strike direction (Figure 14-1), together with the interpreted true dip strings, were used to guide a final set of detailed string envelopes. This approach minimises sectional artefacts introduced by using only one direction of sections and ensures robust representation of mineralisation volumes. Digitised string envelopes were snapped to the top or bottom contacts of the 3D desurveyed drillhole sample data. In addition, blast hole data was used to guide the position of string envelopes. The string envelopes were linked with consecutive wireframe surfaces to form a 3D volume representing the volume of mineralisation.

Figure 14-1 A vertical west to east cross section illustrating a mineralisation string envelope snapped to the drillhole sample data.



Similarly, for the base of complete oxidation, a 3D wireframe surface was generated from interpreted strings as identified in the drillhole logging data per consecutive vertical section. The position of this surface is also guided by the presence of elevated single acid soluble copper assay values. The resulting wireframe surface (Figure 14-2) for the base of complete oxidation subdivides the upper oxide mineralisation from the underlying sulphide mineralisation.

Figure 14-2 A vertical section across Oriental mineralisation, highlighting elevated single acid soluble copper (ASCUPCT) sample grades above the base of oxide (green string) with sulphide mineralisation below.



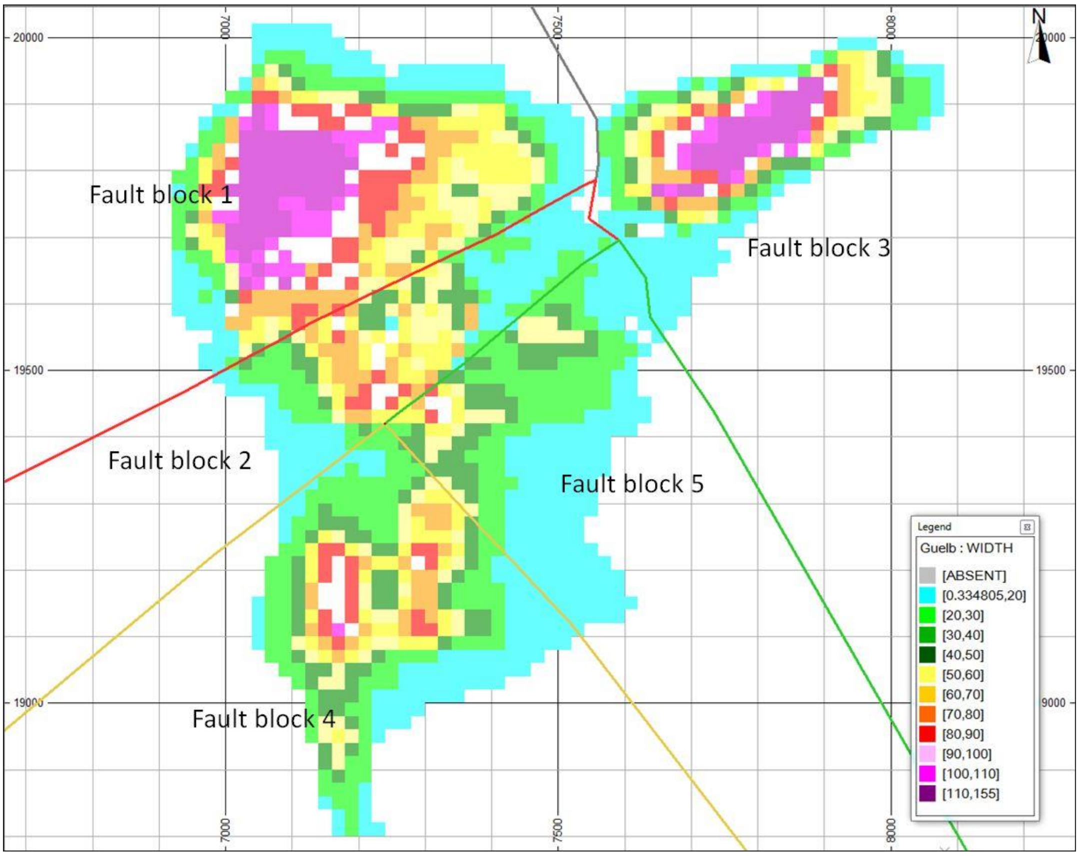
Analysis of the resulting mineralisation wireframe volume highlights distinct lens shaped domains of wider mineralisation (Figure 14-3). It is most likely that these are due to syn- and post-mineralisation structural deformation/faulting. The thicker areas are likely to be zones where faulting has stacked FMC horisons over each other. Accordingly, the mineralisation volume has been sub-divided into these fault block domains (Figure 14-3) each having distinctly grouped lenses. It is noted that future estimates may consider further fault sub-division as observed in the vertical dimension.

Mineralisation domains were developed according to deposit, oxidation and fault block. Resulting domains reduce sample assay variability, improving grade continuity and form the basis for geostatistical spatial analysis (variography) and estimation. Domains are detailed in Table 14-1.

Table 14-1 Guelb Moghrein mineralisation domains

Domain	Fault block	Oxidation	Deposit
111	1	Oxide	Occidental
121	1	Sulphide	Occidental
221	2	Sulphide	Occidental
312	3	Oxide	Oriental
322	3	Sulphide	Oriental
313	3	Oxide	Oriental
323	3	Sulphide	Oriental
421	4	Sulphide	Occidental
521	5	Sulphide	Occidental

Figure 14-3 A plan view of Guelb Moghrein mineralisation highlights distinct lens shaped domains having thicker widths which were grouped into distinct fault blocks.

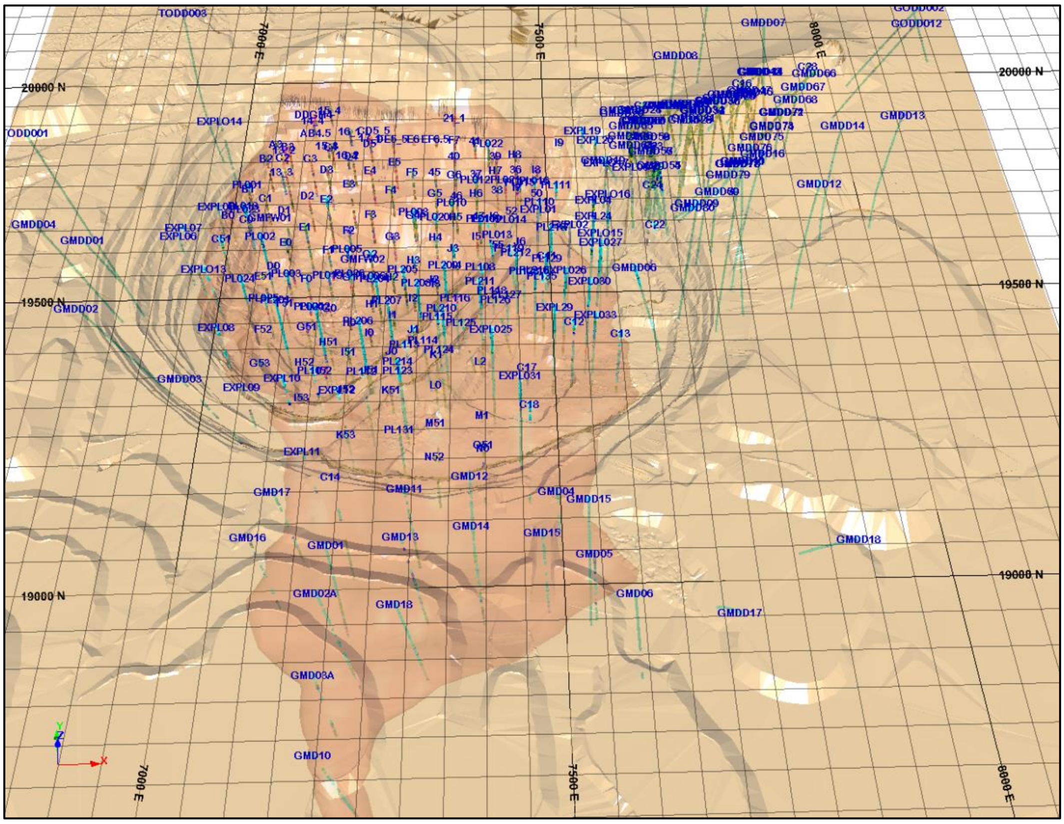


14.3 Available Data for Mineral Resource modelling

14.3.1 Topography data

Upper limits to the 3D block model were defined by a pre-mining topographic surface. The surveyed pit floor as at 31 December 2015 was used to define the upper limit of unmined Mineral Resources (Figure 14-4).

Figure 14-4 An oblique northerly 3D view of the prevailing surveyed topography used for reporting the unmined Mineral Resources together with the available diamond drilled holes (blue).



14.3.2 Drillhole data

Drilling across Guelb Moghrein dates back to as early as 1968. There are 1978 diamond and reverse circulation drilled holes that were selected from the drillhole database and were within an area relevant to the deposits. Of these holes, 1929 have samples with copper assay results and are located in areas that contribute to the development of this resource estimate. 307 were diamond drilled (Figure 14-4 and Figure 14-5) and 1619 used reverse circulation drilling methods. Holes that were exploratory in nature and which did not intersect zones of mineralisation were not sampled. In addition, a total of 11,939 blast holes were included and considered during interpretation of the mineralisation volumes. Blast hole samples were not used during estimation of this mineral resource due to excessive variability associated with sample collection, loss and contamination as well as been within already mined out mineralisation volumes.

14.3.3 Sample data

Samples were routinely analysed for copper, gold and arsenic. Select samples have been analysed for other elements including iron, sulphur, silver, cobalt and density. These additional elements have not been estimated into the resource model due to their relative lack of support. Arsenic sample data was converted into percent from the database's original parts per million units. A general summary of the underlying database statistics is presented in Table 14-2.

Figure 14-5 A plan view of the Guelb deposits and distribution of diamond and reverse circulation drilled holes.

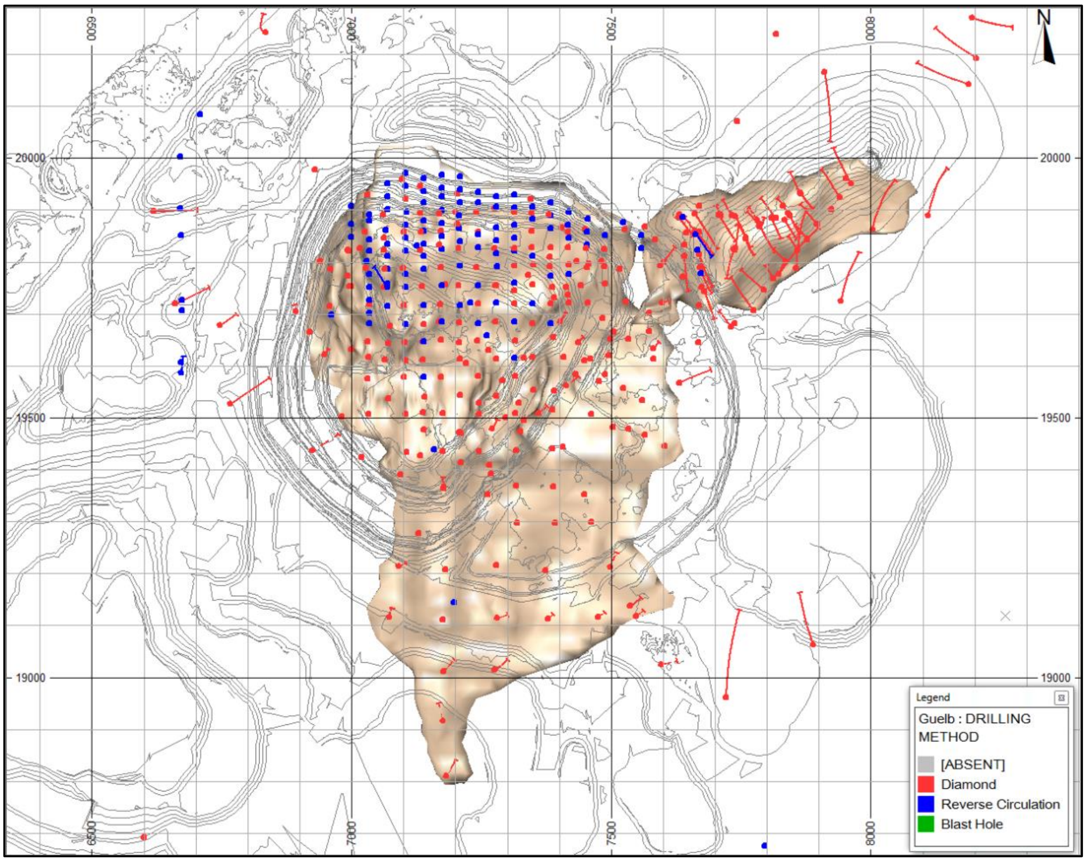


Table 14-2 Table of drillhole statistics per element of interest

Element	No of samples	Total Length (m)	Min	Max	Mean	St Dev
copper (%)	48943	97103	0.001	15.0	0.73	1.11
gold (g/t)	46483	92199	0.001	34.5	0.64	1.25
arsenic (%)	37207	73928	0.0001	1.55	0.07	0.11
iron (%)	4031	7950	0.07	69.28	27.06	18.24
cobalt (ppm)	10712	21214	3.7	4000	134	236.27
silver (g/t)	5947	11797	0.005	8	0.89	0.71
sulphur (%)	7719	15259	0.001	21.41	1.08	2.29
Density (t/m^3)	1975	3564	2.09	4.5	3.22	0.41

A series of data validations were completed prior to desurveying the drillhole data into a 3D format. These included:

- Visual checks of collar elevations against the pit floor survey and original topographic surface digital terrain models. Corrections were required for 58 collar elevations according to the recent topographic survey around Oriental Hill and then for a few historical holes drilled before mining where collars were several metres above the surface. The position of FQM017 and AB4.5 were in conflict with the geology and assays of their surrounding holes and were removed from the data used in this estimate.

- The logging, sampling and assay data were investigated for overlaps, gaps or duplication. Duplicate samples having the same coordinates were identified for 11 of the blast holes. In addition, MAGRC001, MAGRC002, MAGHRC007, MAGRC008, DDGM1, DDGM2, DDGM3, RC050050, RC014045, RC014036 and RC014189 were similarly removed as holes having duplicate coordinates. The MAGRC holes were not assayed and the RC holes were from a close spaced original grade control program.
- Sample lengths from some historical intercepts were in excess of 6 m. These were flagged and not used during this estimate as they would result in too many 2 m composite samples having the same value.
- Assay value checks were completed for samples having values outside of expected limits. Top capping was applied to minimise the risk of high grade samples influencing block estimates in areas of low support.
- Downhole survey data was investigated for excessive deviations. No risks were identified with most holes drilled vertically.

Additionally, the database includes logged lithology codes and bulk density measurements. Individual sample interval lengths range from 0.003 m to 236.6 m with an average sample length of 1.92 m. 99% of samples were taken at intervals between 0.1 m to 6 m, with less than 0.1% of samples having very long lengths and were removed from the database. Core recovery measurements were available for most diamond drilled sampling with details discussed in Item 10. No sample lengths were adjusted or removed from the database data due to poor recovery.

The de-surveyed assay drillhole file was composited and then coded according to each of the mineralisation domains (Table 14-1) for estimation. The de-surveyed and coded data was used for statistical and geostatistical analysis, and in the grade estimation.

14.3.4 Sample Compositing

Downhole compositing of drillhole samples was completed in order to reduce the effect that varying sample length may have on grade values. Compositing was completed in order to support robust statistical analysis and estimates. A 2 m downhole composite length was chosen in order to honour the dominant sample length and the current smallest mining unit bench height of 6 m. Drillhole samples were composited according to their respective sample lengths (length weighted) by been combined down-the-hole. Several holes were randomly selected and composite values validated against the input sample data. Minimal metal loss resulted from the compositing process and no errors were identified.

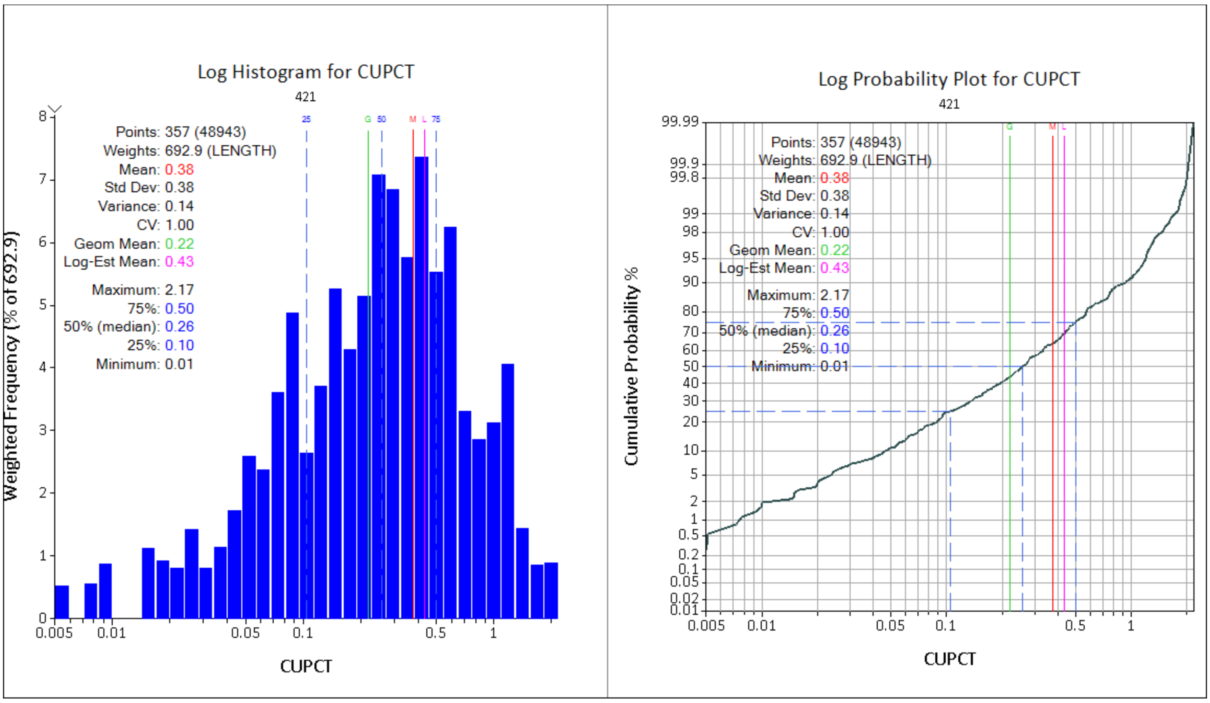
14.4 Statistical Analysis

Statistical data analysis was completed on the composite sample values in order to understand the nature of each domains grade distribution. The purpose was to ensure minimal population mixing per domain and so reduce internal variability which will assist spatial analysis and provide a more robust estimate. If multiple populations were evident from the data analysis, further geological separation and isolation of domains would be pursued. Summary statistics were assessed per domain per element using descriptive statistics (Table 14-3), histograms and log probability curves. An example of the distribution of copper is presented in Figure 14-6. High grades were observed for domains 111 and 121 whereas lower grades were noted for domain 421. Gold histograms had some evidence for detection limit artefacts associated with the different generations of drilling.

Table 14-3 Summary statistics per metal and domain

Assay	Cu%	Cu%	Cu%	Cu%	Cu%	Cu%	Cu%	Cu%	Cu%
Domain	111	121	221	312	313	322	323	421	521
Samples	2000	21874	4217	2097	1	519	26	357	413
Min	0.003	0.0001	0.0001	0.001	0.1672	0.001	0.001	0.005	0.002
Max	15.00	12.50	10.00	13.27	0.17	9.71	0.62	2.17	4.64
Mean	1.80	1.17	0.71	0.73	0.17	0.76	0.17	0.38	1.00
STD	1.71	1.24	0.77	0.90	0.00	1.08	0.15	0.38	0.95
CV	0.95	1.07	1.09	1.23	0.00	1.42	0.93	1.00	0.95
Var	2.93	1.55	0.59	0.81	0.00	1.17	0.02	0.14	0.90
Assay	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t	Au g/t
Domain	111	121	221	312	313	322	323	421	521
Samples	1898	19755	4214	2087	1	517	24	323	393
Min	0.005	0.001	0.001	0.001	0.5333	0.005	0.0078	0.005	0.005
Max	34.50	25.24	11.10	10.00	0.53	4.26	0.58	3.74	5.31
Mean	2.00	0.97	0.60	0.92	0.53	0.62	0.17	0.45	0.84
STD	2.64	1.43	0.79	1.24	0.00	0.74	0.17	0.49	0.92
CV	1.32	1.46	1.31	1.35	0.00	1.19	1.00	1.09	1.09
Var	6.98	2.03	0.63	1.54	0.00	0.55	0.03	0.24	0.84
Assay	As%	As%	As%	As%	As%	As%	As%	As%	As%
Domain	111	121	221	312	313	322	323	421	521
Samples	1110	16075	3384	1944	1	451	24	268	270
Min	0.0001	0.0001	0.0002	0.0006	0.0849	0.0005	0.0007	0.0005	0.0001
Max	0.93	1.55	1.22	1.08	0.08	1.53	0.56	1.55	0.89
Mean	0.12	0.09	0.08	0.13	0.08	0.16	0.08	0.09	0.11
STD	0.14	0.12	0.11	0.13	0.00	0.20	0.13	0.20	0.12
CV	1.16	1.33	1.26	0.95	0.00	1.28	1.57	2.18	1.12
Var	0.02	0.01	0.01	0.02	0.00	0.04	0.02	0.04	0.01

Figure 14-6 A log histogram and probability plot for Cu % in a key sulphide domain (421), highlighting good distribution of values with minimal evidence for population mixing.

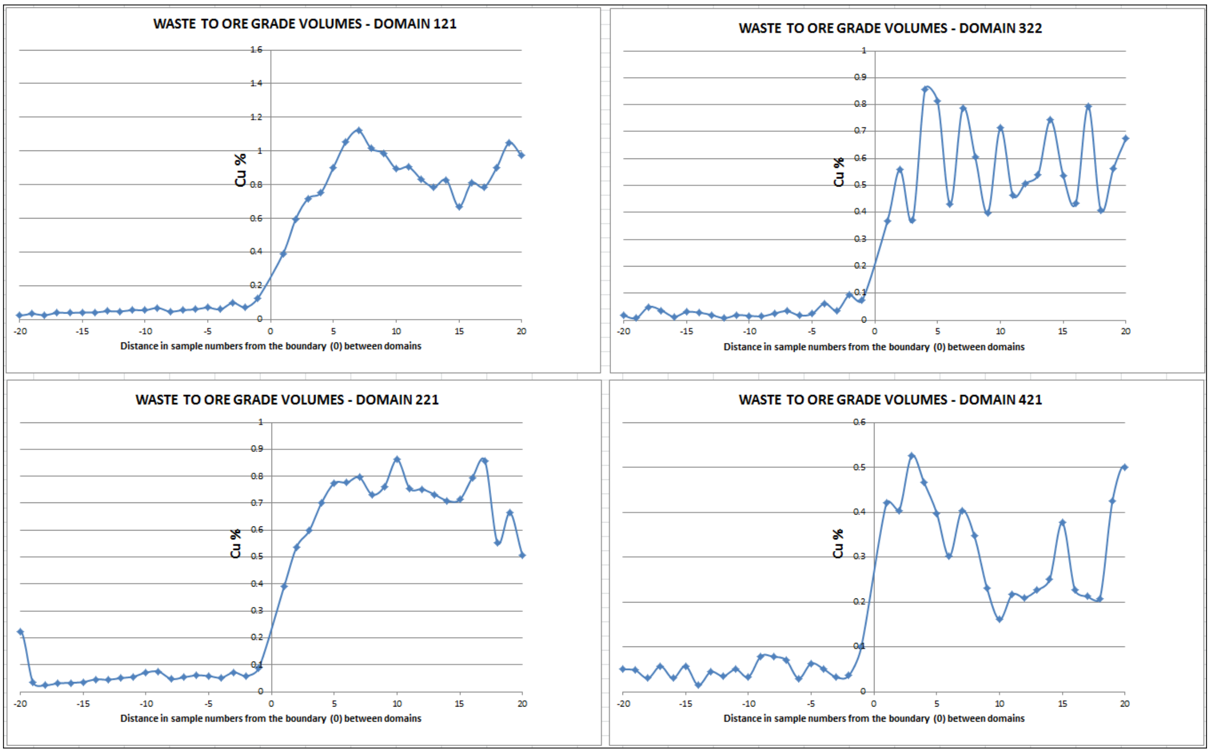


Statistical analysis supports the selected domains has been well defined with a minimal degree of mixing. The coefficients of variation (CV) per metal and per domain were reasonable with very few having values above 1.5.

14.5 Boundary Analysis

Boundary analysis examines the rate of grade change across the contact between waste and ore domains. Graphically the average grade is plotted at increasing distances from the contact boundary. Contact profiles with marked grade changes across the boundary suggest that the two domain datasets should be isolated during interpolation. These are referred to as hard boundaries. Conversely, boundaries having a gradual change in grade across the contact are referred to as soft. Boundary analysis across ore and waste contacts highlight hard boundaries with marked grade changes. Key examples are illustrated in Figure 14-7. There was relatively little change in grade between the oxide and fresh sulphide mineralisation. It is worth noting that all oxide mineralisation has been mined out from the Occidental deposit with only Oriental oxide mineralisation remaining.

Figure 14-7 Copper grade profiles with increasing distance from the contact between respective domains of ore and waste.



Hard boundary conditions were applied to all domain contacts (Table 14-1) for each element estimated into the block model.

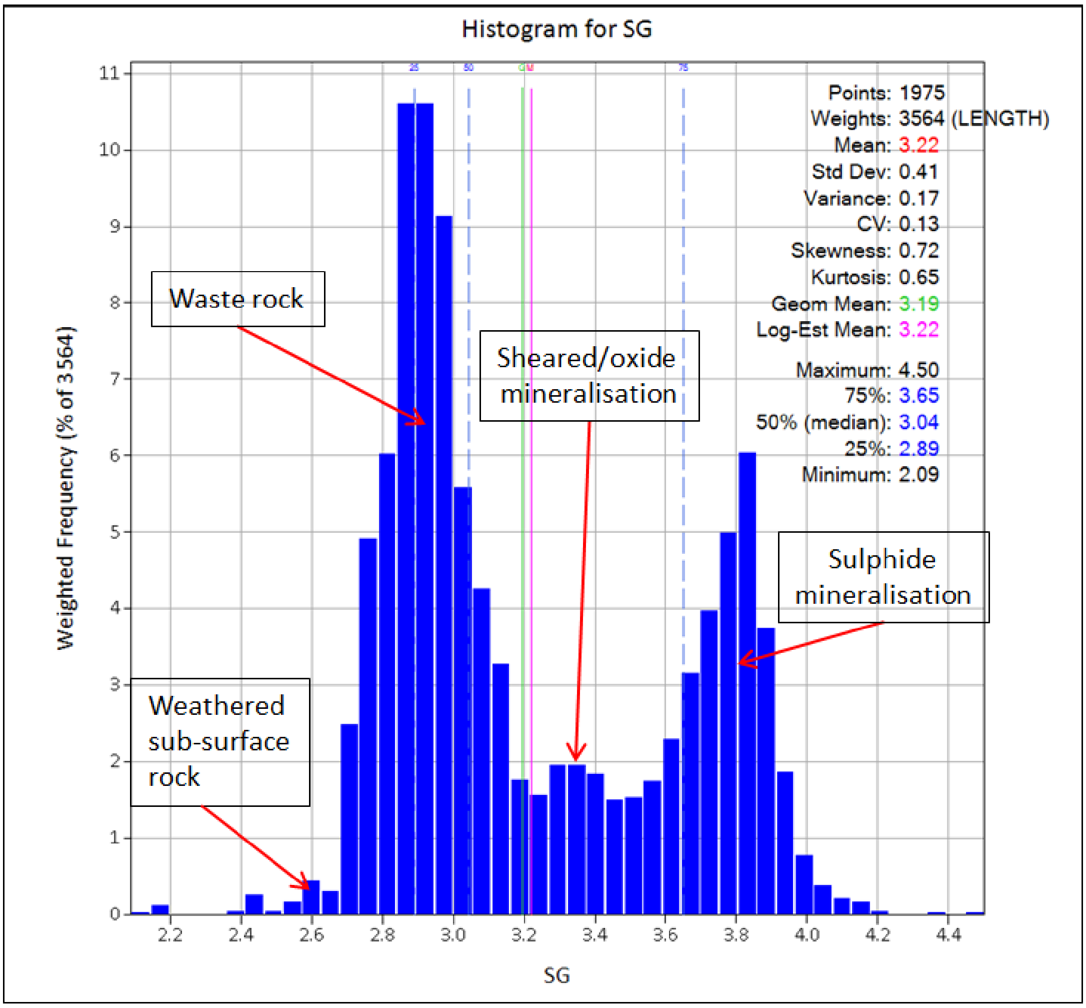
14.6 Density Data

Density measurements were completed during the more recent FQM drilling. However, of the 48,943 samples with copper analysis, only 1975 have density measurements. There is insufficient density data to allow robust interpolation into the block model. Mean density assignments were therefore required for this estimate. In order to establish the density value to be assigned to the block estimates, density data was statistically analysed for mixed populations and correlation with Cu %. A scatter plot of density and Cu % shows some correlation of density and mineralisation with two key groups evident. The majority of low (<3.2 t/m^3) density samples were grouped with non-mineralised rock. Most high density samples (>3.2 t/m^3) were associated with higher copper grades. However, respective analysis of these two groups of data highlights poor correlations between density values and copper grades. As such, density assignment according to copper grade was not employed. From histogram (Figure 14-8) and probability plot analysis, four distinct density populations were evident. Spatial investigation of these populations identifies that:

- the low density population (<2.7) is associated with sub surface weathered material.
- the population with density values between 2.7 and 3.08 is associated with non-mineralised material with a mean value of 2.90 t/m^3.
- the population with density values between 3.08 and 3.5 is associated with more sheared lithologies and mineralisation and has a mean value of 3.3 t/m^3.
- the population with density values above 3.5 is associated with good sulphide mineralisation with a mean value of 3.78 t/m^3.

From the available density data there were insufficient (~14) density samples from the oxide zone for determining a representative mean oxide density value. The historically assigned value of 3.2 t/m^3 was used for oxide material at the Oriental deposit. Non-mineralised material external to FMC was adjusted from the data mean of 2.9 to 2.95 t/m^3 due to there been some sporadic low grade mineralisation and that available density data does not cover this material. Historically a value of 3.0 t/m^3 was used for non-mineralised material. The mean density value for mineralised FMC was decreased from the data mean of 3.78 to 3.76 t/m^3 due to the presence of lower density sheared material within these volumes. It is relevant to note that the degree of shearing is decreasing with increasing depth. Domains 421 and 521 are narrower than domains 221 and 121. Hence the increase in FMC sulphide mineralisation density values from previous estimates 3.7 to 3.76 t/m^3.

Figure 14-8 A histogram plot of all density data highlighting no outlier data and four key density populations.



The assigned mean density values according to data analysis of the drillhole composites is listed in Table 14-4.

Table 14-4 Summary of density measurement statistics per domain

Material	Ore/Waste	SG
FMC – Sulphide	Ore	3.76
FMC – Oxide	Ore	3.2
Metabasalt	Waste	2.95

14.7 Bivariate element relationships

The correlation coefficient between copper and gold is good for most domains. Correlation coefficient between arsenic and copper is poor. The volumes of gold mineralisation are spatially coincident with copper and were grouped into the same domains. Arsenic is a deleterious element impacting upon processing and as such not of direct economic interest. Arsenic was estimated into the respective domains as per the available sample data.

14.8 Top Cutting

The many different campaigns of drilling, sampling and analysis since 1968 warranted that top cuts be assessed from histograms and log probability plots of original sample values per campaign. This approach reduces the risk of outlier sample values been carried through to spatial analysis and estimation. Top capping of outlier samples was employed in order to reduce the population variance and so minimise the risk of high grade samples affecting poorly informed block estimates. Outlier samples are commonly related to sampling, analytical or data handling errors. The following top cuts were applied (Table 14-5). In each case the percentage of samples cut was less than 1% with limited to no effect on the sample data mean values.

Table 14-5 Summary table of top cut values.

Stage	Company	Method	Period	Cu (%)	Au (g/t)	As (ppm)	Density
FEX05	FQML	RC	2005	5.5	10.5	5500	-
FMR14	FQML	RC	2014	-	-	-	-
FBH12	FQML	RC	2012	10.5	15	15500	-
FBH80	GGI	RC	1997	15	35	8000	-
FBH94	GGI	RC	1994	-	-	-	-
FBH95	GGI	RC/DD tails	1995	15	35	15000	-
FGT11	FQML	DD	2011	-	-	-	-
FHR95	Micuma/Somima	DD	1968-1973, 1976 & 1977	12.5	10	-	-
FHR96	GGI	DD	1994, 1995, 1997	5.5	15	-	-
FHR97	Somima	DD	1970's	10	-	-	-
FRES13	FQML	DD	2013	10	10	15500	4.5
FRES10	FQML	DD	2010	0.8	0.8	10000	-
FRES08	FQML	DD	2008	-	6	5000	4.5
FRES07	FQML	DD	2007	9	10	10000	4.5

14.9 Variography

Variograms, representing 3D grade continuity, were generated for copper, gold and arsenic using composite data per mineralised domains. Variograms were generated using Snowden Supervisor v8.3. The following methodology was applied:

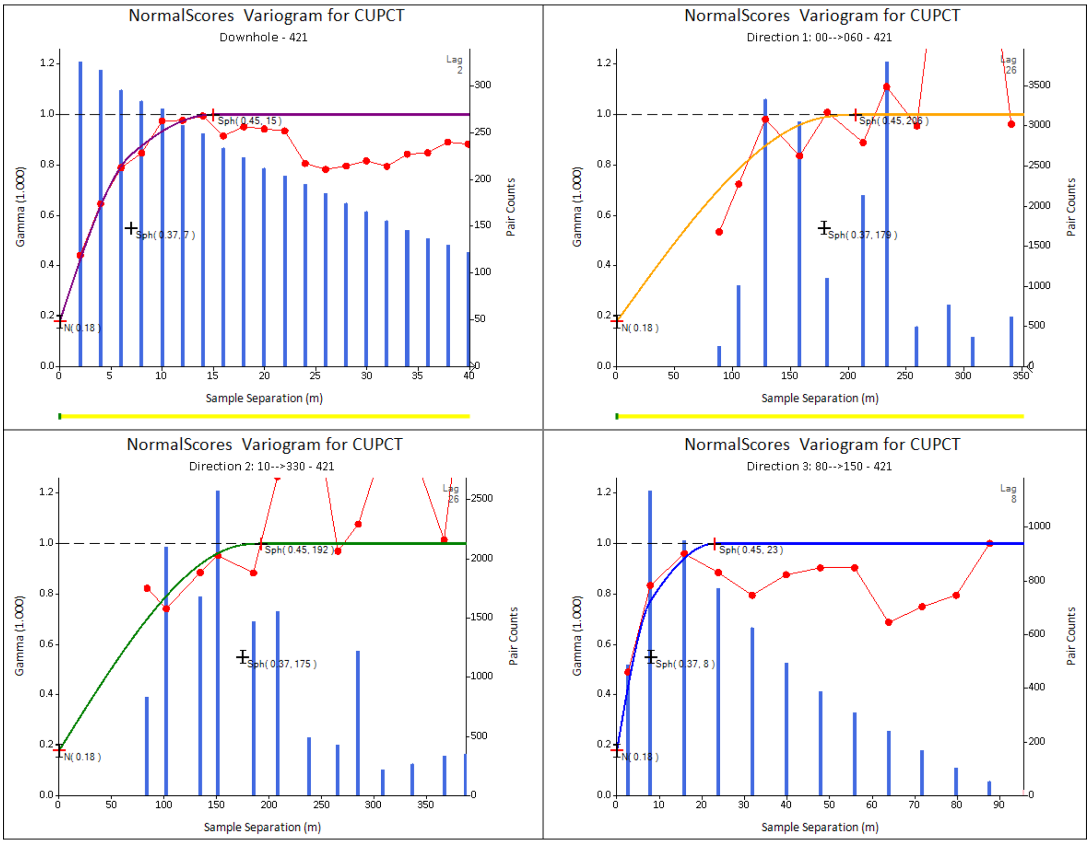
- the principal axes of anisotropy were determined using variogram fans based on normal scores variograms
- directional normal scores variograms were calculated for each of the principal axes of anisotropy
- downhole normal scores variograms were modelled for each domain to determine the normal scores nugget effect
- variogram models were determined for each of the principal axes of anisotropy using the nugget effect from the downhole variogram
- the variogram parameters were standardised to a sill of one
- the variogram models were back-transformed to the original distribution using a Gaussian anamorphosis and used to guide search parameters and complete ordinary kriging estimation
- the variogram parameters were re-calculated according to the population variance for each domain to permit post-processing of the copper panel estimates to SMU estimates.

The multidirectional variogram model results are summarised in Table 14-6. Variogram model nugget values were clearly defined (Figure 14-9) from the close spaced data with copper having low values and gold slightly higher nugget values. Each domains variograms were modelled using two to three spherical structures. The ranges of influence were clearly visible from the variograms, providing confidence in domain data selections and grade continuity. Variogram models were completed for copper, gold and arsenic per domain. Variograms for domain 313 and 323 were based upon domain 312 and 322 respectively.

Table 14-6 Variogram parameters per domain for copper

Domain	Nugget	Structure	Sill differential	Bearing	Plunge	dip	Major axis	Semi axis	Minor axis
111	0.102	1	0.44	-120	15	-135	17	34	10
111		2	0.458				107	69	45
121	0.16	1	0.28	0	150	20	10	5	4
121		2	0.21				57	15	18
121		3	0.35				163	89	40
221	0.25	1	0.44	140	10	180	26	26	23
221		2	0.31				220	132	58
312	0.159	1	0.31	160	25	170	71	41	9
312		2	0.3				208	115	23
312		3	0.231				229	125	49
322	0.1	1	0.32	150	20	180	69	45	18
322		2	0.58				178	57	41
421	0.18	1	0.37	150	10	180	179	175	8
421		2	0.45				206	192	23
521	0.13	1	0.36	0	0	-20	31	38	7
521		2	0.51				140	64	30
999	0.25	1	0.44	0	-15	0	26	26	23
999		2	0.31				220	132	58

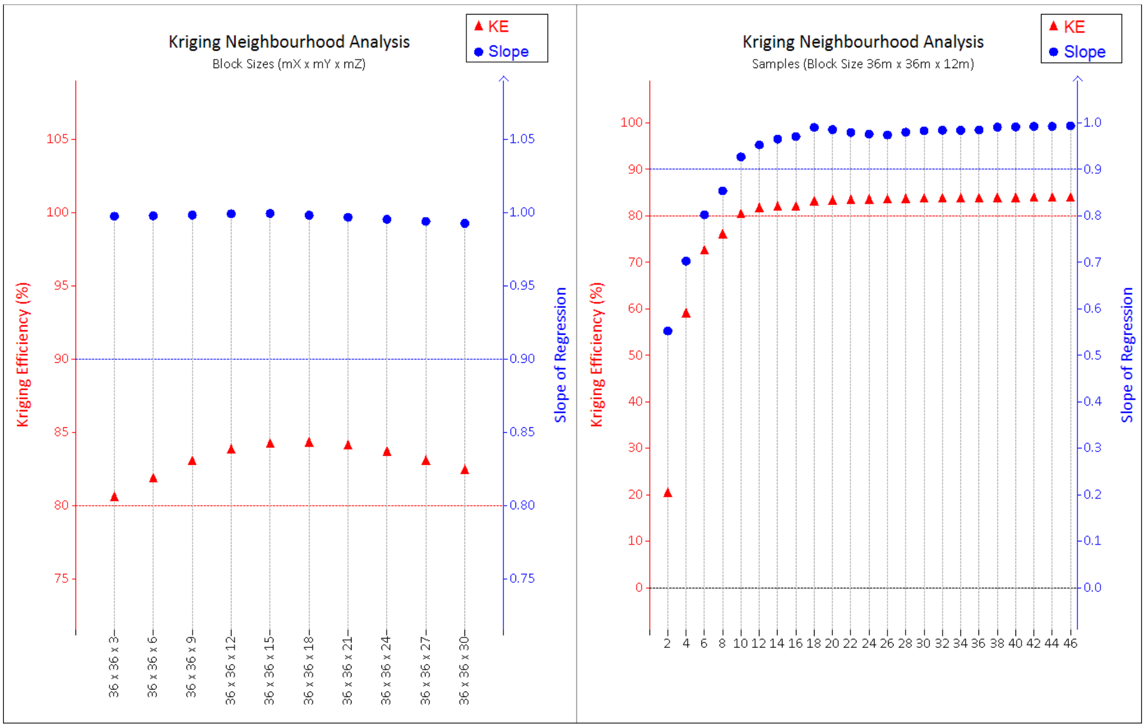
Figure 14-9 Variogram models for Domain 421 copper



14.10 Kriging Neighbourhood Analysis

A kriging neighbourhood analysis (KNA) was completed to determine optimal block size, ellipse dimensions, minimum and maximum numbers of samples to be used for grade estimation as well as the discretization parameters. Correctly defined sample selection parameters are essential to optimising the estimation process and help reduce the risk of conditional bias (overestimation of high grades and underestimation of low grades). An optimum parent block size of 32 m by 32 m by 12 m was selected (Figure 14-10) together with a minimum of 10 samples and a maximum of 24 for the estimation routine. KNA was completed using Snowden Supervisor's KNA analysis tools.

Figure 14-10 Kriging neighbourhood analysis for domain 421 and highlighting optimal kriging efficiency for the selected block size together with minimum and maximum number of samples.



14.11 Block Model Setup and Limits

A 3D empty block model was developed in Datamine to cover the Occidental and Oriental deposit extents. Dimensions and coordinate origins of this model are defined in Table 14-7. The parent block size was set to 32 m x 32 m x 12 m as per the KNA study and a sub-block size of 8 m x 8 m x 6 m was used in order to ensure accurate representation of mineralised volumes and to honour the smallest mining unit (SMU) dimensions. The block model was not rotated or unfolded.

Table 14-7 Mine coordinate system block model parameters – limits and dimensions

Direction	Minimum	Maximum	Parent Block Size (m)	SubBlocks Size (m)	# SubBlocks
East	6600	8264	32	8	208
North	18600	20520	32	8	240
Elevation	500	1292	12	6	132

Using the domain wireframes, block centroids were assigned domain code values. During this process, blocks along a domain boundary are coded if the centroid of the block occurs within the volume of that domain.

14.12 Interpolation Parameters

The parent blocks copper, gold and arsenic were estimated using Ordinary Kriging (OK). OK was deemed an appropriate estimation technique due to the near normal distributions and limited domain grade mixing of the respective domains input data. The interpolation parameters are summarized by domain in the Table 14-8. Estimation into parent blocks used a discretisation of 3 (X points) by 3 (Y points) by 2 (Z points) to better represent the block volume shape. Each domain was estimated using hard boundaries.

Table 14-8 Copper, gold and arsenic estimate sample selection parameters per domain. The second pass is 1.5 times the first search range and the third pass is 3 times the first search range.

Domain	Search ellipse range (m)			No of composite samples		
	X	Y	Z	Min/block	Max/block	Max/hole
111	110	110	50	10	24	3
121	150	150	50	10	24	3
221	200	150	50	10	24	3
312	180	120	40	10	24	3
322	150	90	40	10	24	3
421	200	170	30	10	24	3
521	120	100	35	10	24	3
Waste(999)	70	70	6	10	24	3

During grade estimations the sample selection criteria were the same per metal. This ensures that copper and gold correlations were honoured per block estimate. 98% of mineralisation domain blocks were estimated using the first search pass.

14.13 Post-processing by Localized Uniform Conditioning

A localised uniform conditioning estimate (LUC) was completed for copper, gold and arsenic across the mineralised domains. Uniform conditioning (UC) provides an estimate of the proportion of smallest mining unit blocks (SMU) inside the parent block that are above a cut-off grade and their corresponding average grade. UC does not provide spatial information pertaining to these SMU grades. LUC provides the spatial grade estimates of the blocks that are smaller (SMU) than the parent block size. LUC results in an assessment of recoverable resources available per domain at the scale of mining and is particularly relevant in the more widely drilled areas. The parent block size used was 32 m by 32 m by 12 m and the SMU block size was 8 m by 8 m by 6 m. LUC models were validated by:

- Visual comparisons with drillhole sample grades and the OK sample grades
- Checks that the SMU average grade is the same as the Parent grade
- Checking that contained copper at a zero cut-off grade is the same for the OK estimates and the LUC estimates.

LUC was only completed for those blocks not supported by RC grade control drilling. Blocks located within the RC grade control drilled areas were estimated directly into the SMU block size. No deviations or anomalies were noted by the QP, Mr David Gray.

14.14 Background model

A background model was generated across the Guelb Moghrein deposit area to capture all mineralisation that was not included in the estimated domains. Grades (copper, gold and arsenic) were estimated into each parent block using a single search and sample selection criteria as per Table 14-8. In addition the background model was coded with oxidation, fault block and mined material. Blocks located between the original topography and the 31 December 2015 pit floor survey, were coded with a value of 1 in a MINED field. Blocks located within mine dumps and stockpiles were coded with a value of 2 and blocks located within the final life of mine pitshell were coded with a value of 3. All other block material was classified as unmined and was assigned a value of 0.

14.15 Validation of Block Model Estimates

The results of the modeling process were validated through several methods including a visual review of the model grades in relation to the underlying drillhole sample grades; comparisons with the change of support model and grade distribution comparisons using swath plots.

14.15.1 Visual Validations

Detailed visual validations comparing block model and input data grades was conducted along northsouth and eastwest vertical sections. The validation included confirmation of the correct domain coding of blocks. Figure 14-11 illustrates two central vertical cross section validations representing the LUC block (SMU) copper grades and the input drillhole composite copper grades.

14.15.2 Summary statistics

Summary statistics comparing each domain’s mean input composite grade, the mean parent block estimate, highlights good results reflecting the respective domains mineralisation (Table 14-9). The comparison between parent mean estimate and LUC mean estimate has no differences.

Figure 14-11 Vertical cross sections looking east and looking north illustrating good validation between drillhole sample copper values and block copper estimates.

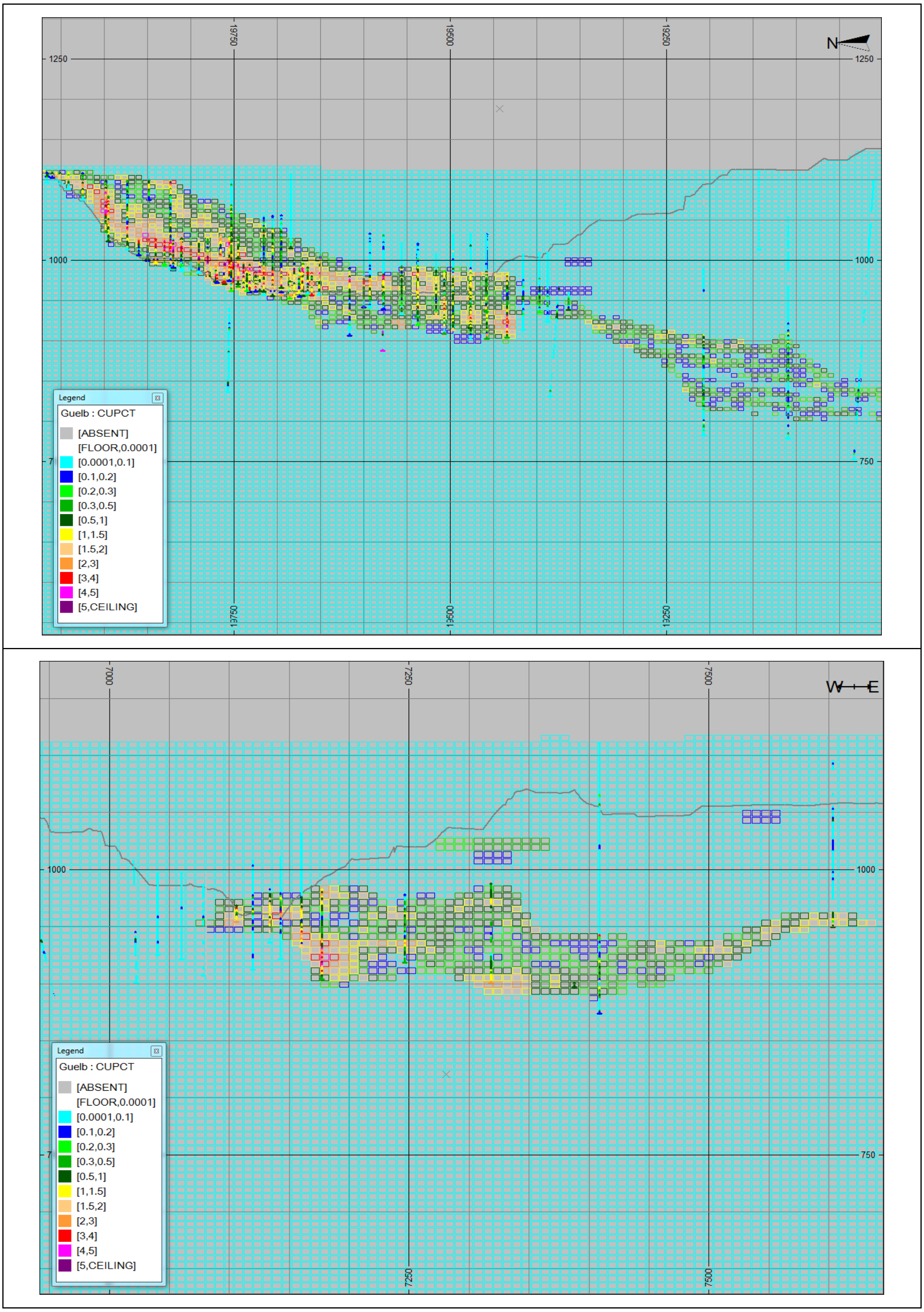


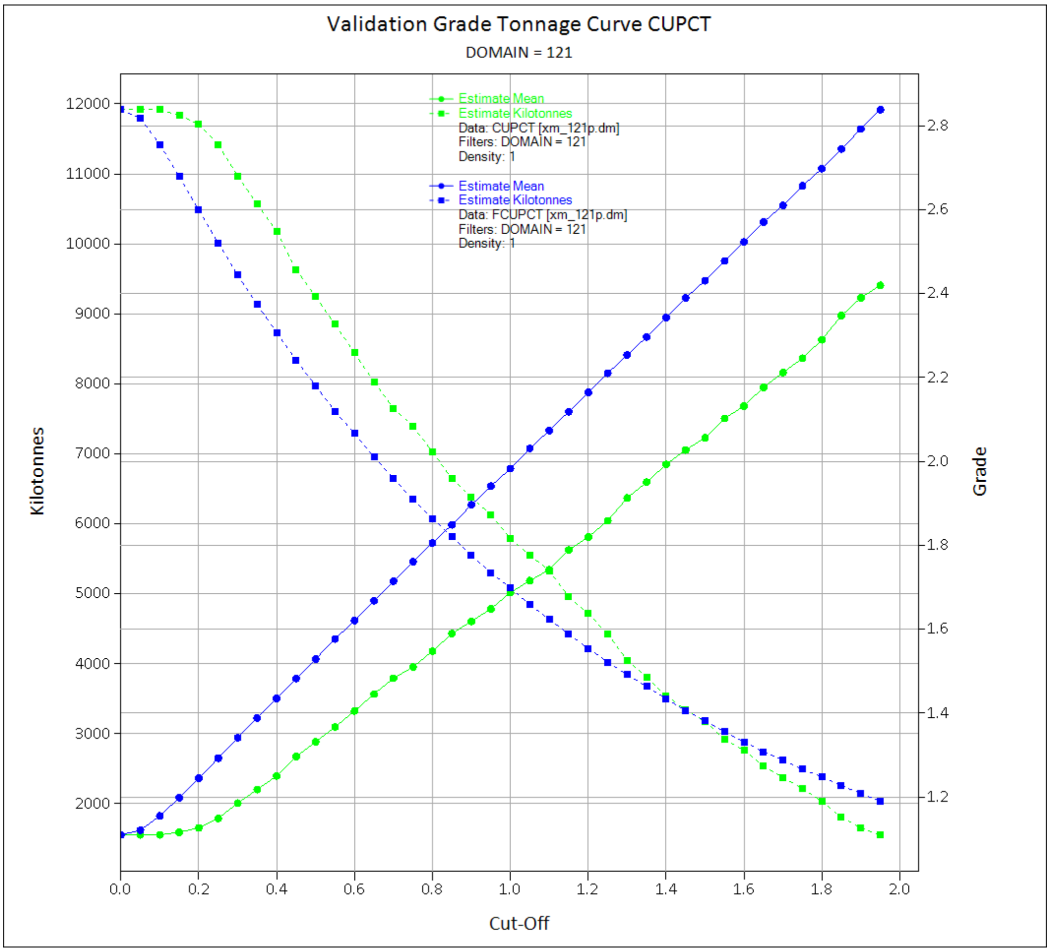
Table 14-9 Validation of Parent block estimate with input composite data

Domain	Metal	Composite grade	Parent estimate	% Variance
111	**Cu %**	1.60	1.65	3.1%
111	**Au g/t**	1.73	1.81	4.4%
121	**Cu %**	1.17	1.11	-5.0%
121	**Au g/t**	0.97	0.97	-0.4%
221	**Cu %**	0.71	0.70	-0.6%
221	**Au g/t**	0.61	0.60	-1.8%
312	**Cu %**	0.73	0.68	-6.0%
312	**Au g/t**	0.93	1.02	10.1%
322	**Cu %**	0.77	0.83	7.6%
322	**Au g/t**	0.64	0.70	9.6%
421	**Cu %**	0.37	0.37	-0.4%
421	**Au g/t**	0.44	0.45	0.9%
521	**Cu %**	0.89	0.81	-9.0%
521	**Au g/t**	0.74	0.72	-2.7%

14.15.3 Model Checks for Change of Support

The parent (OK) and the LUC (SMU) estimates were compared at various cut-off grades using grade/tonnage curves (Figure 14-12). Overall, there is very good correlation between models and overall copper metal was preserved (the same) in both model estimates at zero cut-off. As expected, the LUC estimates provide greater resolution (more tonnes) at higher grades. The LUC estimate better honours the input data grade distribution than the parent (OK) estimate, which tends to be smoothed.

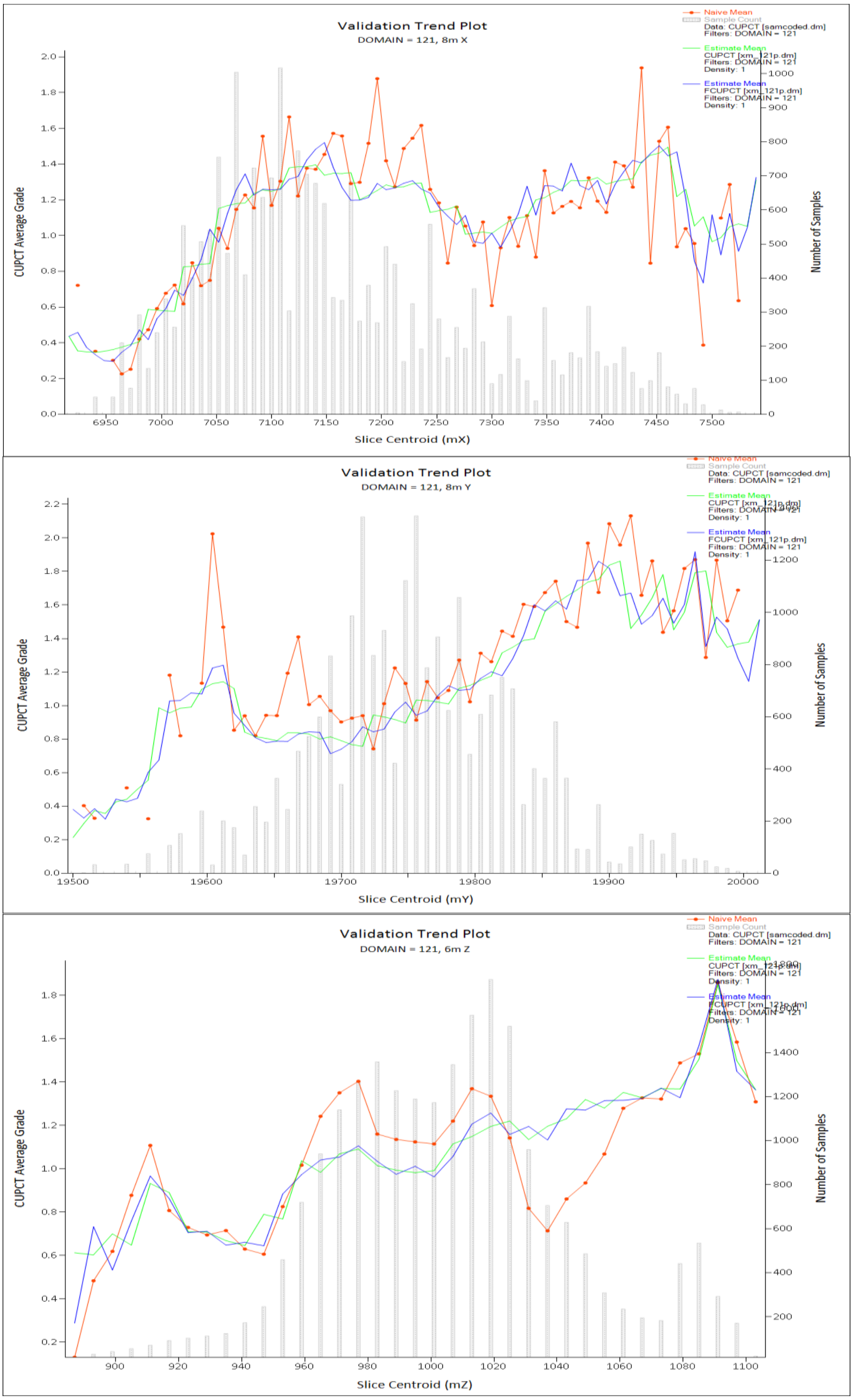
Figure 14-12 Grade and tonnage distribution of LUC (Blue) and OK (green) copper block estimates for domain 121.



14.15.4 Swath Plots validations

Swath plots compare the mean grades of the input data and block estimates for consecutive widths in a particular direction (easting, northing or vertical). Grade variations from the OK model were compared to those derived from the input grade data. All domain metal estimates were validated using swath plots. No validation issues were identified. Examples of copper parent block estimates for domain 121 are shown in Figure 14-13.

Figure 14-13 Validation slices comparing Domain 121 copper estimates and input data for easting, northing and vertical directions.



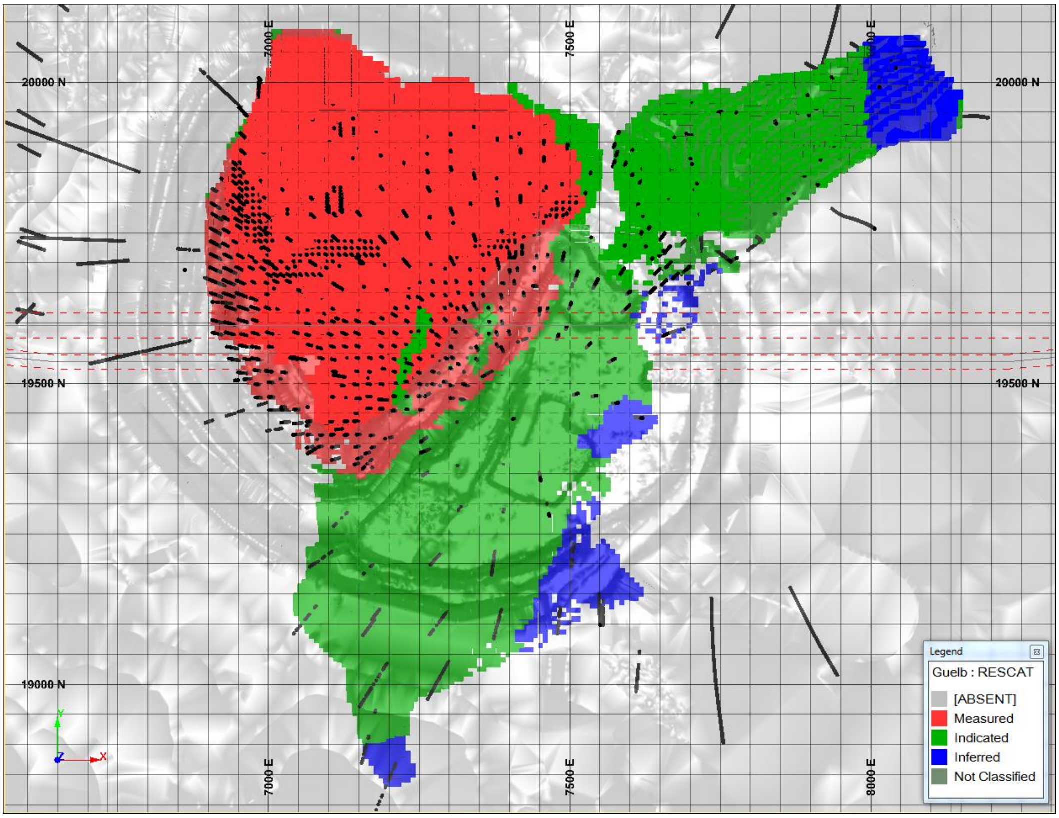
In conclusion, the summary statistics, visual validations and swath plots, the OK parent and LUC SMU estimates are consistent with the input drillhole composite data, and are believed to constitute a reasonable representation of the respective domains of mineralisation.

14.16 Mineral Resource Classification and Reporting

Mineral Resource estimates of the Guelb Moghrein deposits have been classified and reported using the guidelines of the JORC Code (JORC, 2012), which in turn comply with the Standards on Mineral Resources and Reserves of the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM Guidelines, 2014). Classification (Figure 14-14) was primarily based upon confidence in the drillhole data, geological continuity, and the quality and confidence of the resulting kriged estimates. Geological confidence is supported by the available close spaced drill data and the mapping observations within the pit. Confidence in the kriged estimates was associated with drillhole grid spacing, QAQC of sample data, kriging efficiency and regression slope values as well as geological continuity.

Measured Mineral Resources (Figure 14-14) were generally deemed appropriate in areas where the drill grid spacing was close to 25 m. Kriging efficiency was greater than 80% and regression slope values were greater than 0.8. Indicated Mineral Resources were assigned to block estimates where the drill grid was between 25 m to 75 m, where the kriging efficiency was between 60 % to 80% and where regression slope values were greater than 0.6. Block estimates that did not meet the measured or indicated criteria and that were within 100 m of a single drillhole with geological continuity, were assigned to the inferred category. Typically, inferred block estimates had a kriging efficiency less than 40% and regression slope value less than 0.4.

Figure 14-14 A 3D plan view of the Mineral Resource classification.



Indicated Mineral Resource areas (Figure 14-14), edges and deeper extents are recommended as locations for planned infill and extensional drilling in order to assure geological and grade continuity as well as to develop extensional opportunity for the open pit and underground mining.

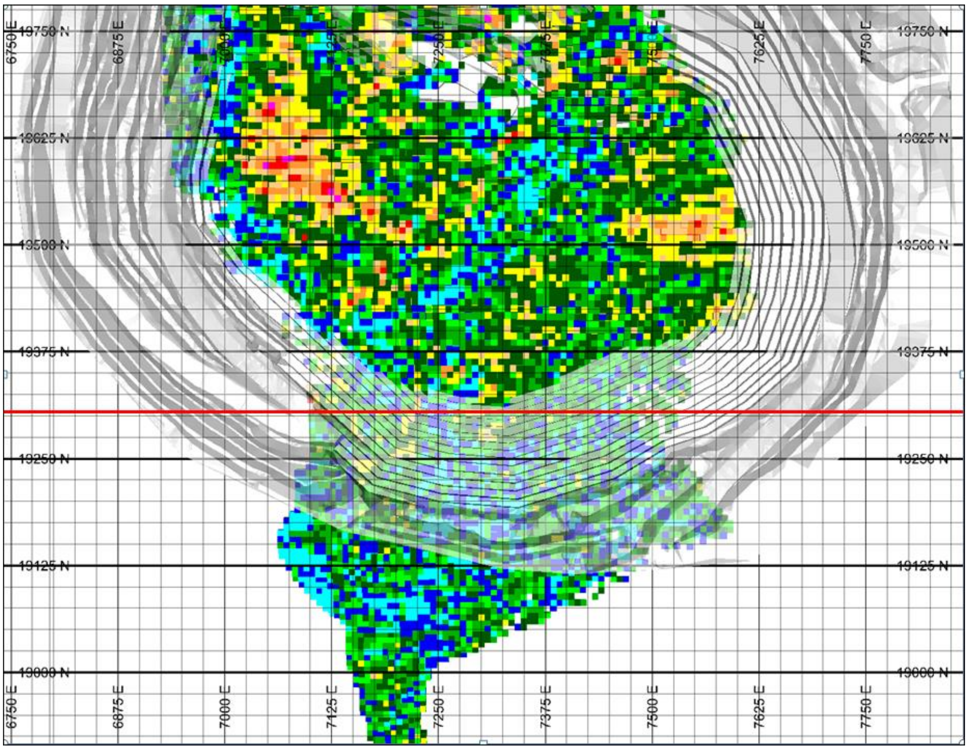
The Mineral Resource statement as at the end of December 2015 was sub divided into two areas for reporting purposes. A CuEq cut-off grade of 0.5% was used for reporting Mineral Resources proximal to the final pit shell (Figure 14-15) and north of the 19,300 m northing (Table 14-10). Cutoff values were guided by the Mineral Reserve study results. These Mineral Resources are inclusive of Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The copper equivalent formula uses feasibility level mining costs, recoveries and metal prices, and is:

CuEq=TCu% + (Au ppm x 0.3741)

A total Cu cutoff grade of 0.5% (higher than the CuEq of 0.5%) was used for reporting the Mineral Resources south of the 19300 m northing (Table 14-11). None of these Mineral Resources were converted to Mineral Reserves. The deeper (south of 19,300m northing) Mineral Resources were located in an area where alternate and more costly mining methods would need to be considered.

The total Guelb Moghrein Mineral resource statement is presented in Table 14-12.

Figure 14-15 A 3D plan view highlighting the 19,300m northing position (red line) where the Mineral Resource (coloured blocks) was split for reporting at different cutoff grades.



There are no known factors related to environmental, permitting, legal, title, taxation, socio-economic, marketing or political issues which could materially affect this Mineral Resource statement.

Table 14-10 Mineral Resource north of the 19,300 m northing and depleted of mining as at 31 December 2015. A CuEq cut-off of 0.5% was used.

Material	Classification	Tonnes (Mt)	Cu %	Au g/t	As %	Cu t	Au oz
Sulphide	Measured	18.21	0.79	0.63	0.07	144,523	369,138
Sulphide	Indicated	13.64	0.89	0.77	0.10	120,838	338,529
Measured & Indicated		**31.85**	**0.83**	**0.69**	**0.08**	**265,361**	**707,667**
Sulphide	Inferred	0.26	0.83	0.65	0.09	2,194	5,490
Material	**Classification**	**Tonnes (Mt)**	**Cu %**	**Au g/t**	**As %**	**Cu t**	**Au oz**
Oxide	Measured	0.08	1.40	1.81	0.04	1,136	4,724
Oxide	Indicated	7.42	0.86	1.00	0.14	63,622	237,896
Measured & Indicated		**7.51**	**0.86**	**1.01**	**0.13**	**64,759**	**242,620**
Oxide	Inferred	1.76	0.72	2.41	0.18	12,625	136,889
Classification		**Tonnes (Mt)**	**Cu %**	**Au g/t**	**As %**	**Cu t**	**Au oz**
Sub total Measured & Indicated		**39.36**	**0.84**	**0.75**	**0.09**	**330,119**	**950,286**
Total Inferred		**2.03**	**0.73**	**2.18**	**0.17**	**14,819**	**142,379**

Table 14-11 Mineral Resource statement south of the 19,300 m northing and depleted of mining as at 31 December 2015. A Cu cut-off of 0.5% was used.

Material	Classification	Tonnes (Mt)	Cu %	Au g/t	As %	Cu t	Au oz
Sulphide	Measured	-	-	-	-	-	-
Sulphide	Indicated	4.22	0.80	0.59	0.10	33,901	80,555
Sub total Measured & Indicated		**4.22**	**0.80**	**0.59**	**0.10**	**33,901**	**80,555**
Sulphide	Inferred	0.37	0.92	0.67	0.12	3,403	8,005

Table 14-12 Total Mineral Resource statement of combined cutoff areas and depleted of mining as at 31 December 2015. A Cu cut-off of 0.5% was used for blocks south of the 19,300 m northing and a CuEq cut-off of 0.5% was used for blocks north of the 19,300 m northing.

Material	Classification	Tonnes (Mt)	Cu %	Au g/t	As %	Cu t	Au oz
Sulphide	Measured	18.21	0.79	0.63	0.07	144,523	369,138
Sulphide	Indicated	17.86	0.87	0.73	0.10	154,739	419,084
Measured & Indicated		**36.07**	**0.83**	**0.68**	**0.09**	**299,262**	**788,222**
Sulphide	Inferred	0.63	0.88	0.66	0.11	5,598	13,496
Material	**Classification**	**Tonnes (Mt)**	**Cu %**	**Au g/t**	**As %**	**Cu t**	**Au oz**
Oxide	Measured	0.08	1.40	1.81	0.04	1,136	4,724
Oxide	Indicated	7.42	0.86	0.73	0.10	63,622	174,239
Measured & Indicated		**7.51**	**0.86**	**0.74**	**0.10**	**64,759**	**178,962**
Oxide	Inferred	1.76	0.72	2.41	0.18	12,625	136,889
Material	**Classification**	**Tonnes (Mt)**	**Cu %**	**Au g/t**	**As %**	**Cu t**	**Au oz**
Total Measured & Indicated		**43.57**	**0.84**	**0.69**	**0.09**	**364,021**	**967,184**
Total Inferred		**2.40**	**0.76**	**1.95**	**0.16**	**18,222**	**150,384**

14.17 Mineral Resource Estimate Comparisons

The Guelb Moghrein Mineral Resource estimate update has considered the follow changes since the previous estimate:

- Inclusion of close spaced blast hole data, which together with diamond drill and reverse circulation samples have been considered in interpretation of mineralisation wireframe volumes.
- Inclusion of additional infill and extensional diamond drilling of deeper deposit areas.
- Use of latest in-pit geology mapping and logging data in 3D geology modelling, as well as support from mining, processing and reconciliation data.
- Improved wireframing of mineralisation domains aided by the additional infill and extensional drilling. Fault block geological domains have resulted, each having unique styles of mineralisation thereby minimising domain mixing.
- Estimation parameters were optimised with a kriging neighbourhood analysis, additional data and improved variography.
- Ordinary kriging was used to estimate grades into a parent block size. A change of support routine (known as localised uniform conditioning or LUC) was applied to the parent block estimates. LUC determines the grades of smaller blocks, relevant to the scale of mining (SMU block size). This provides for a more representative resource grade and tonnage at the scale of mining.

In comparing the results of this update to the previous estimate, both block models were depleted of mining as at 31st December 2015 and reported using the previously adopted copper cutoff of 0.5%. The comparison highlights an increase (12%) in measured and indicated sulphide tonnages at the Occidental sulphide deposit. Total copper grades have increased by 5% and gold grades have increased by 27%. These grade and tonnage changes result in an increase in copper and gold metal and have supported using a copper equivalent cutoff in order to increase potentially economic material.

As well as Occidental, this estimate update has incorporated further development of the Oriental extension, which will continue to be the focus for further geological and economic evaluation from 2016 onwards.

It is important to note that the Guelb deposits' mineralisation is still largely open along its edges and at depth (Figure 14-14), suggesting further extension opportunity from the recommended infill and extensional drilling planned for 2016.

ITEM 15 **MINERAL RESERVE ESTIMATE**

15.1 Optimisation

15.1.1 Introduction

Pit optimisation was carried out using Whittle Four-X and the resource model developed in December 2015. The optimisation was undertaken assuming flotation copper concentrates produced from fresh mineralisation will continue to be shipped from site in containers. Oxide material is treated as waste in this optimisation (as with all previous optimisations) but will continue to be stockpiled separately in case a viable processing option arises.

The first objective of the pit optimisation was to define the economic limits and check these against the current ultimate pit design. The second objective was to review the push-back strategy using the current pit surface and a series of staged shells to smooth the stripping ratio and test that the final stages of mining at Guelb Moghrein maximise the NPV. The stage pit shells output from Whittle Four-X were used to check and where necessary, modify the dressed designs which incorporate haul roads, ramps, and safety berms.

Actual project operating cost data was obtained from MCM's production records up to the end of 2015 and the 2016 operating budget, but were adjusted to take account of projected improvements from current projects. Load and haul costs were adjusted to take account of the different haul profiles from now until the end of mining.

For the purposes of Reserve estimation, inferred mineralisation was ignored. However, it should be noted that given the very low quantity of inferred mineralisation within the pit shells, the inclusion or exclusion of inferred mineralisation in the economic analysis has negligible impact on the optimisation results.

In addition to the selection of the ultimate pit and interim stages under base case conditions for pit design, a suite of sensitivity analyses were carried out for ± 20 % variation in metal prices as well as variable mining and process operating costs.

15.1.2 Pit Optimisation Input Parameters

Pit slope design criteria

Pit optimisation input included overall slope design angles as shown in **Error! Reference source not ound.**.

Table 15-1 Overall pit slope angles for optimisation input

	Occidental	Oriental
Footwall	30 degrees	30 degrees
Hangingwall	46.5 degrees	43 degrees

The detailed parameters for Occidental are listed in Item 15.4. The parameters for Oriental are based on extrapolated design information.

Metal prices

The optimisation inputs for metal prices were as follows:

- Copper = US$3.00/lb (US$6,615/t)
- Gold = US$1,200/oz

Given the projected mine life is beyond 2020, the metal prices used were FQM long term outlook prices based on the December 2015 consensus price forecasts.

Metal recoveries

Metal recovery figures adopted for pit optimisation are shown in Table 15-2.

Table 15-2 Metal recovery figures used for Pit Optimisation

Copper	
Copper to Flotation Conc (%)	94.00%
Smelter Recovery (%)	96.60%
Overall Copper (%)	**90.80%**
Gold	
Gold Bullion from CIP (%)	0.00%
Gold to Flotation Conc (%)	56.00%
Smelter Offtake Adjustment (%)	90.00%
Smelter Recovery (%)	98.00%
Overall Gold (%)	**49.39%**

The Copper recovery estimate in this table was based on an estimate developed in 2014. The gold recovery estimate assumes gold recovery by flotation only. Smelter recoveries have been taken from the current off-take agreements.

Operating costs

Since the Project will be mill constrained, the process operating costs are the sum of the fixed and variable costs, and are as follows:

- variable operating costs = $19.77/t processed
- fixed costs (equivalent G&A costs in variable terms) = $7.53/t processed
- total operating costs = $27.31/t processed

Details of these cost estimates and their derivation are outlined in Item 21 of this report.

Variable mining costs comprising drill, blast, load and haul costs, on a bench by bench basis, were determined based upon a reference elevation at 1,032 RL. The mining cost was used for ore and waste, and the overall average cost over the life of mine is as follows:

- average mining cost = $2.06/t

Metal costs

Metal costs for the product streams comprise the parameters listed in Table 15-3. These costs were taken from the base terms of the current off-take arrangements.

Copper Equivalent

Following the economic parameters described above, the copper equivalent calculation which takes into account gold credits was as follows:

Net Value Gold	37.04 * 49.39% = 18.29 $/g
Net Value Copper	53.85 * 90.80% = 48.89 $/10kg
Copper Equivalent	= 0.3741%Cu

Table 15-3 Metal cost parameters used for Pit Optimisation

Metal Costs Copper	
Grade in Concentrate (% Cu)	22.50%
Transport to Port ($/t Conc.)	50.00
Transport Port to Smelter ($/t Conc.)	60.00
Smelting ($/t Conc.)	81.50
Refining ($/lb Cu)	0.08150
Royalty on Revenue (%)	3.0%
Royalty on Revenue ($/lb Cu)	0.090
Total Copper Metal Cost ($/lb Cu)	**0.558**
Metal Costs Gold	
Royalty on Revenue (%)	4.0%
Total Gold Metal Cost ($/g Au)	**1.543**

Note: Transport charges were included as metal costs in the optimisation only.

Mining dilution and recovery factors

Pit optimisation assumptions included mining dilution and mining recovery factors of 1.05 and 0.95, respectively. The dilution is assumed to be at zero grade.

15.2 Marginal cut-off grades

Whittle uses the simplified formula to calculate the marginal cut-off grade as listed in Table 15—5.

Marginal COG = (PROCOST x MINDIL)/(NR)
where PROCOST is the sum of the processing cost plus the ore mining cost differential, and MINDIL is the mining dilution factor

Table 15-4 Marginal cut-off grades (indicative averages)

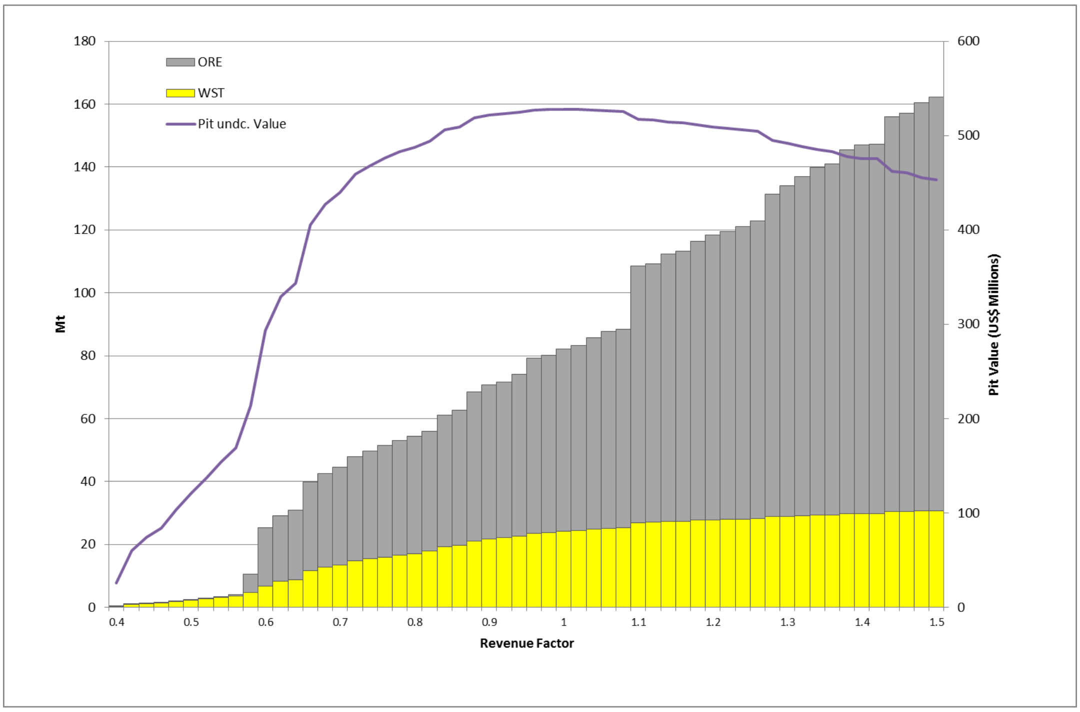
	Units	Oxide
Marginal Cut-Off Grade:		
PROCOST	$/t ore	27.31
MINDIL factor		1.05
TOTAL NET RETURN	$/10kg	53.85
Average Recovery	%	90.8
C/O GRADE	**%Cu**	**0.586**

It should be noted here that this Whittle cut-off grade calculation using the input parameters described above, in particular the long term metal prices which were based on the December 2015 consensus forecasts, is the cut-off grade that was used for the reserves estimate.

15.3 Optimisation results

Figure 15-1 shows the graphical result of pit optimisation. The optimal shell (34) was selected on a maximum net return (undiscounted) basis. Table 15—5 lists the complete inventory of shell sizes and corresponding cashflows.

Figure 15-1 Guelb optimisation results

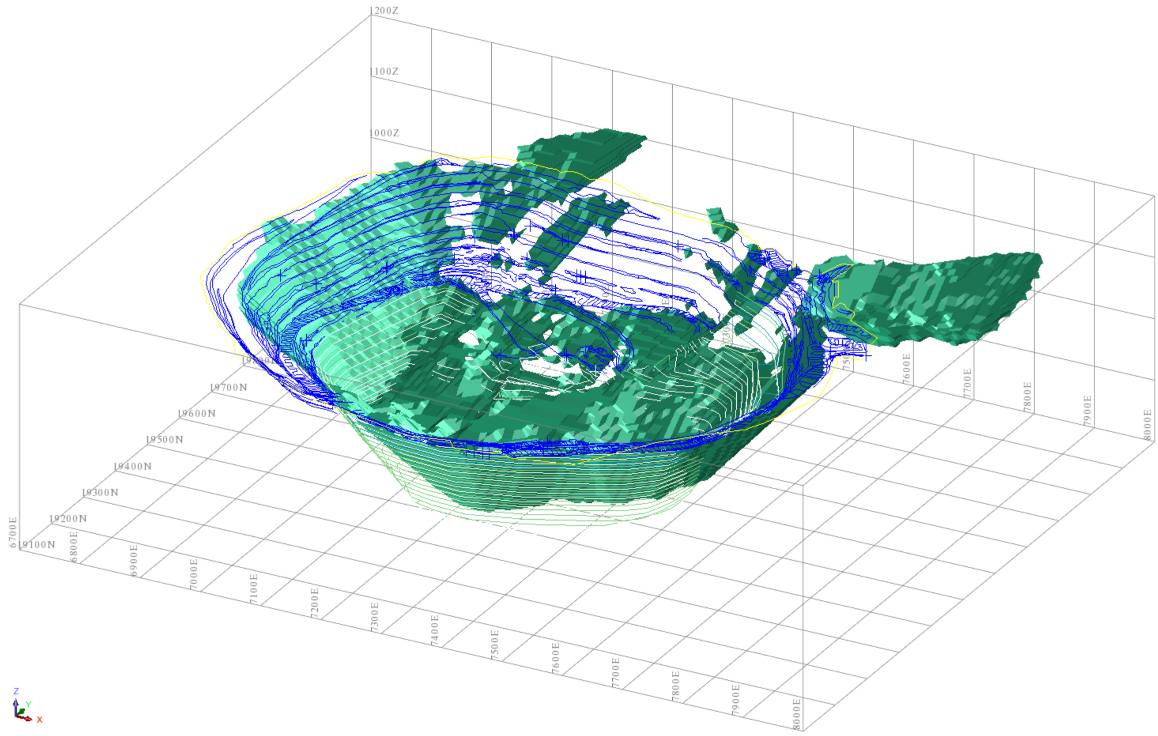


Initial analysis of pit optimisation with the base case parameters and comparison with the current pit designs showed that the current Final Pit (Cut 3) matches reasonably well with the maximum net return shell. Following detailed evaluation, the current final pit was modified and used to define this Reserve update.

One thing that was noted during the review of the shells from the optimisation was that a new pit is showing around the Oriental mineralisation which is adjacent to the north east crest of the final

Occidental pit. In order to assess the robustness of a pit at Oriental, other pit shells were examined and it was noted that the Oriental shell first appears at approximately current copper prices.

Figure 15-2 Guelb optimisation shell 34 compared with Cut 3 Design



15.3.1 Oriental Deposit

As can be seen in Figure 15-2 above, there is a small shell outside the north-east corner of the current Occidental pit design. This small shell is related to the Oriental deposit and the optimisation is suggesting that mining the sulphide mineralisation from this deposit may be economic. Previously the Oriental deposit has been considered as an oxide deposit, however there is a sulphide zone at the base of the oxide zone of mineralisation. The resource model indicates there is a total sulphide resource of 2.76 Mt at 0.84% copper and 0.71 g/t gold. The optimisation (which treated all oxide mineralisation as waste) indicates that within shell 34, there is a potentially mineable inventory of 1.81 Mt at 1.06% copper and 0.86 g/t gold. Given the relatively high grade and the fact the pit shells started appearing in the optimisation around current copper prices, the Oriental deposit now needs further investigation, including the development of potential pit designs and determining whether mining of Oriental can be added in the future to the LOM schedule.

Table 15—5 Pit optimisation shell sizes and cashflow

Pit Number	Revenue Factor	Material Mined (Mt)	Total Ore Processed (Mt)	Strip Ratio Waste:Ore	Grade (%Cu)	Grade (g/tAu)	Cu in Conc (kt)	Au in Conc (kt. Oz)	Pit Value ($M)
1	0.34	0.0	0.0	0.1	2.17	1.40	0.5	1.2	3.6
2	0.36	0.1	0.1	0.1	1.90	1.51	1.2	3.4	8.4
3	0.38	0.2	0.2	0.1	1.90	1.32	3.1	7.5	18.3
4	0.40	0.3	0.3	0.1	1.85	1.24	4.5	10.7	25.7
5	0.42	0.9	0.8	0.1	1.57	1.16	11.7	30.6	59.8
6	0.44	1.3	1.1	0.2	1.54	1.12	15.1	38.9	74.4
7	0.46	1.5	1.3	0.2	1.52	1.10	17.2	44.3	84.2
8	0.48	2.0	1.7	0.1	1.44	1.01	22.2	55.3	103.0
9	0.50	2.4	2.2	0.1	1.35	0.94	26.4	65.5	120.2
10	0.52	3.0	2.6	0.2	1.30	0.89	30.7	74.8	136.8
11	0.54	3.7	3.2	0.2	1.24	0.85	35.6	86.5	153.7
12	0.56	4.4	3.6	0.2	1.21	0.82	39.8	96.3	168.9
13	0.58	16.2	4.7	2.4	1.22	0.86	52.6	130.8	214.1
14	0.60	43.9	6.7	5.6	1.27	0.93	76.8	199.2	293.6
15	0.62	50.2	8.2	5.1	1.20	0.88	88.8	231.9	329.7
16	0.64	53.2	8.8	5.1	1.17	0.87	93.3	245.9	343.6
17	0.66	68.2	11.7	4.8	1.09	0.86	115.1	324.0	405.8
18	0.68	72.3	12.7	4.7	1.06	0.85	122.6	349.0	426.9
19	0.70	75.7	13.5	4.6	1.04	0.84	128.3	365.6	439.8
20	0.72	81.1	14.8	4.5	1.02	0.83	136.4	393.0	459.3
21	0.74	84.0	15.4	4.5	1.00	0.82	140.2	404.1	468.0
22	0.76	86.7	16.0	4.4	0.99	0.81	144.5	415.8	476.3
23	0.78	89.2	16.7	4.4	0.98	0.80	148.4	427.8	483.4
24	0.80	91.5	17.1	4.3	0.97	0.79	151.1	434.3	487.8
25	0.82	94.3	17.9	4.3	0.96	0.78	155.2	446.2	494.4
26	0.84	103.0	19.3	4.3	0.93	0.76	163.9	470.2	506.2
27	0.86	105.7	19.8	4.3	0.93	0.75	166.8	478.4	509.4
28	0.88	115.7	21.2	4.5	0.91	0.74	174.5	504.8	518.7
29	0.90	119.9	21.7	4.5	0.90	0.74	177.7	515.3	521.7
30	0.92	121.3	22.1	4.5	0.89	0.73	179.4	520.0	523.0
31	0.94	125.4	22.7	4.5	0.89	0.73	182.3	531.1	524.9
32	0.96	135.0	23.6	4.7	0.88	0.72	187.6	548.3	527.1
33	0.98	136.5	23.8	4.7	0.87	0.72	188.5	552.0	527.5
34	**1.00**	**140.1**	**24.3**	**4.8**	**0.87**	**0.72**	**191.1**	**559.5**	**527.7**
35	1.02	142.0	24.5	4.8	0.86	0.71	192.1	562.9	527.6
36	1.04	146.6	24.8	4.9	0.86	0.71	193.6	568.3	527.2
37	1.06	150.5	25.2	5.0	0.86	0.71	195.3	573.4	526.3
38	1.08	151.7	25.2	5.0	0.85	0.71	195.7	574.4	525.9
39	1.10	190.0	27.0	6.0	0.85	0.70	207.8	606.5	517.6
40	1.12	191.3	27.1	6.1	0.85	0.70	208.1	607.4	516.9
41	1.14	197.3	27.3	6.2	0.85	0.70	209.8	612.9	514.7
42	1.16	199.0	27.5	6.2	0.84	0.70	210.4	614.4	513.7
43	1.18	205.1	27.7	6.4	0.84	0.70	211.9	619.2	511.2
44	1.20	209.0	27.9	6.5	0.84	0.69	212.7	622.3	509.0
45	1.22	211.0	28.0	6.5	0.84	0.69	213.1	623.2	507.9
46	1.24	214.1	28.1	6.6	0.84	0.69	213.7	625.6	506.3
47	1.26	217.5	28.2	6.7	0.84	0.69	214.4	627.6	504.3
48	1.28	233.8	28.8	7.1	0.83	0.69	218.3	637.5	495.2
49	1.30	239.1	29.0	7.2	0.83	0.69	219.1	640.6	492.2
50	1.32	244.8	29.2	7.4	0.83	0.69	220.1	645.1	488.4
51	1.34	250.3	29.4	7.5	0.83	0.69	221.0	647.5	484.9
52	1.36	252.6	29.5	7.6	0.83	0.69	221.5	649.0	483.3
53	1.38	261.2	29.7	7.8	0.83	0.68	223.0	653.9	477.8
54	1.40	264.3	29.9	7.9	0.82	0.68	223.3	656.5	475.5
55	1.42	264.6	29.9	7.9	0.82	0.68	223.4	656.7	475.2
56	1.44	281.7	30.4	8.3	0.82	0.68	226.0	669.2	462.4
57	1.46	283.8	30.5	8.3	0.82	0.68	226.2	670.7	460.7
58	1.48	290.3	30.7	8.5	0.82	0.68	227.0	673.5	455.8
59	1.50	293.8	30.8	8.6	0.82	0.68	227.6	674.5	453.0

15.3.2 Optimisation sensitivity analyses

Optimisation sensitivity analyses were completed to test the impact of varying copper price, overall mining and processing costs and pit slopes. Table 15-6 shows the results of the analysis and confirms that selling price is the most sensitive variable (sensibly, since this is related to net return).

Table 15—6 Results of pit optimisation sensitivity analyses

Sensitivity Case	Material Mined Mt	Total Ore Processed Mt	Strip Ratio Waste:Ore	Grade %Cu	Grade g/tAu	Cu in Conc kt	Au in Conc kt. Oz	Pit Value $M	Value % diff
Mining cost * 105%	138.8	24.1	4.7	0.87	0.72	190.4	275.1	520	98
Base Case	140.1	24.3	4.8	0.87	0.72	191.1	276.4	528	100
Mining cost * 95%	141.8	24.4	4.8	0.87	0.72	191.4	277.1	536	102
Processing cost * 105%	137.1	23.0	5.0	0.89	0.73	185.6	267.6	496	94
Base Case	140.1	24.3	4.8	0.87	0.72	191.1	276.4	528	100
Processing cost * 95%	142.5	25.0	4.7	0.86	0.71	194.0	281.3	561	106
Pit slopes * 105%	136.6	24.6	4.6	0.87	0.72	193.3	279.5	539	102
Base Case	140.1	24.3	4.8	0.87	0.72	191.1	276.4	528	100
Pit sloopes * 95%	146.8	23.9	5.1	0.87	0.72	189.0	273.1	516	98
Metal Price * 105%	146.8	25.2	4.8	0.85	0.71	195.2	283.3	612	116
Base Case	140.1	24.3	4.8	0.87	0.72	191.1	276.4	528	100
Metal Price * 95%	134.3	22.6	4.9	0.89	0.74	183.8	264.3	446	85

15.4 Pit Geotechnical and Design

15.4.1 Design Parameters

The pit slope parameters used during for the Guelb Moghrein pit designs referred to in this report are based on the latest recommendations from independent geotechnical engineer Mike Turner (Turner Mining and Geotechnical Pty Ltd) who last visited site and undertook a geotechnical review in November 2015. The design slope sectors (geotechnical domains) are shown in Figure 15-2.

The design parameters for the Occidental Pit as listed in Table 15—7 were issued in November 2013 (Turner, 2013) and implement the vertical batters that were trialled successfully in early 2013. Previous batter angles were 70° to 75° which were causing issues with drilling productivity as well as crest damage on berms. Pit wall conditions have improved significantly since the adoption of the new design guidelines. All temporary and permanent ramps have been designed at a gradient of 1 in 10 and width of 25 metres.

Figure 15-2 Pit geotechnical domains

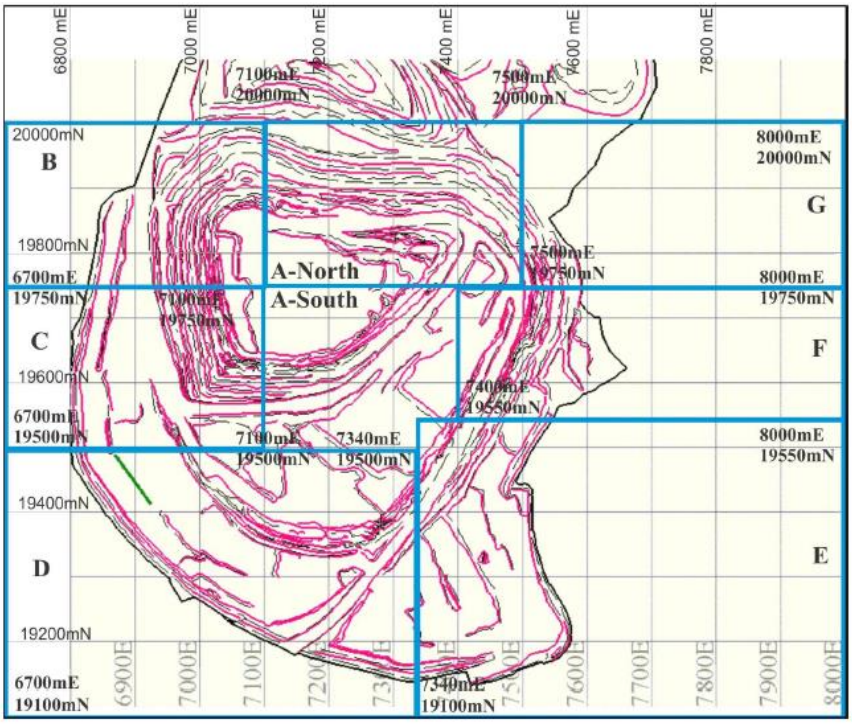


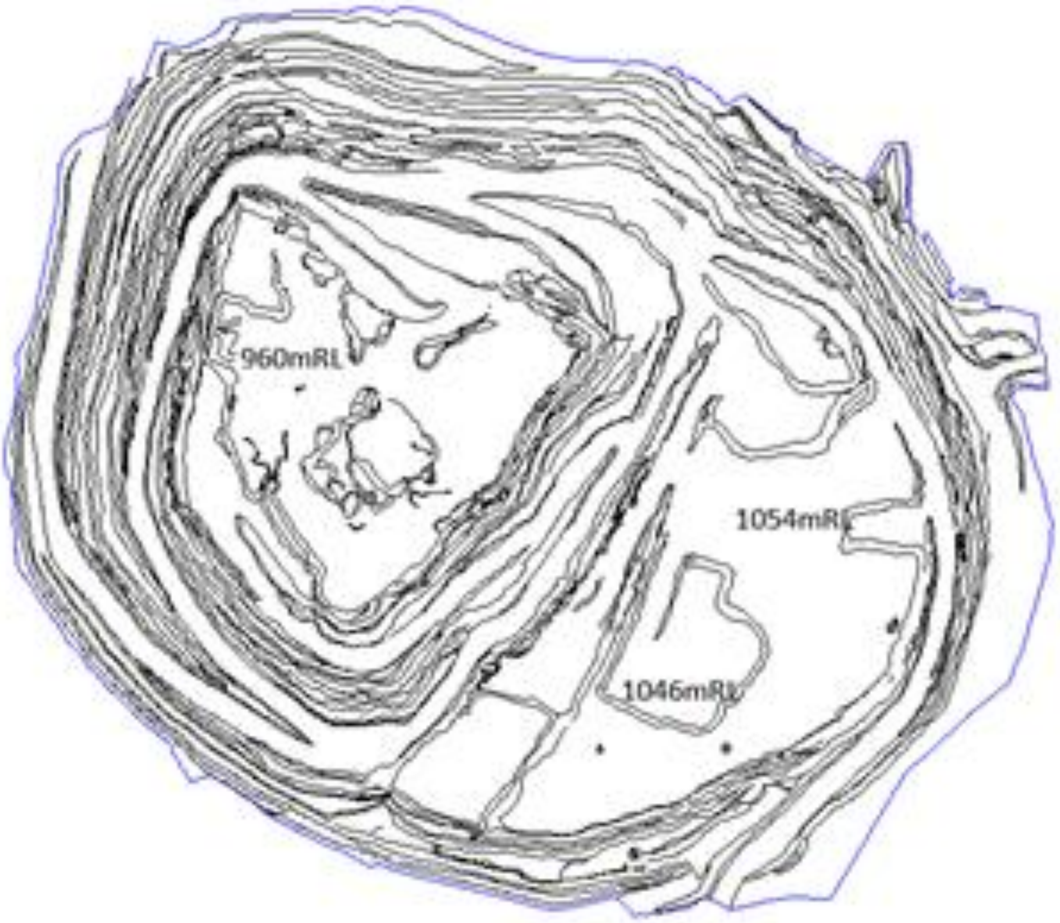
Table 15—7 Updated Slope Design Guidelines (Turner, 2013)

Domain	Inter-ramp Slope Angle	Batter Angle	Batter Height	Berm Width
Overburden	Remove overburden			
Weathered (top 15m)	39°	50°	15m	6m
Domain A (North)	49°	70°	12m	6m
Domain A (South)	56°	90°	12m	8m
Domain B (Northwest)	52°	75°	12m	6m
Domain B (Northwest) South of 19930mN	56°	90°	12m	8m
Domain C (West)	56°	90°	12m	8m
Domain D (Southwest)	56°	90°	12m	8m
Catch-berm every 60m				10m
Domain E (Southeast)	56°	90°	12m	8m
Catch-berm every 60m				10m
Domain F (East)	56°	90°	12m	8m
Domain G (Northeast)	56°	90°	12m	8m

15.4.2 Pit Designs

As can be seen in the December 2015 end of month survey (Figure 15-3), the Stage 1 starter pit is no longer visible. Cut 2 has almost been completed (around 960mRL) and mining in the final pushback to Cut 3 has reached 1046 mRL to 1054 mRL.

Figure 15-3 End of Month Survey – December 2015



The Cut 2 pit design is the current working design basis for mining of Stage 2 (Figure 15-4). The final pit design (Cut 3) in Figure 15-5 matches with optimisation shell 34. The pit exit on the west side of the pit is for ore and the southern exit is mainly for waste.

Figure 15-4 Cut 2 Design

Figure 15-5 Guelb Ultimate Pit Design – December 2015

15.5 Mineral Reserve Estimate

Table 15.4 shows the NI 43-101 compliant reserve estimate for sulphide mineralisation contained within the final pit (Figure 15.4) is 21.4 Mt after applying modifying factors to the Measured and Indicated Resources as defined in the December 2015 Resource Statement (Table 14.1). A further 1.9 Mt of ore is on the ROM stockpile and 6.6 Mt of Low Grade material is on the long terms stockpiles.

Table 15-4 Guelb Moghrein Reserve Estimate, at $3.00/lb Cu and $1,200/oz Au

Guelb Moghrein Sulphide Ore Reserve Estimate December 31 2015				
	Volume Mbcm	Tonnes Mt	Tcu %	Au g/t
Pit				
Proven Reserve	3.4	12.7	0.81	0.63
Probable Reserve	2.3	8.6	0.89	0.80
Total	**5.7**	**21.4**	**0.84**	**0.70**
ROM Stockpile				
Proven Reserve	0.7	1.9	0.90	0.97
Probable Reserve	-	-	-	-
Total	**0.7**	**1.9**	**0.90**	**0.97**
Reserve Without Low Grade				
Proven Reserve	4.1	14.7	0.82	0.68
Probable Reserve	2.3	8.6	0.89	0.80
Total	**6.4**	**23.3**	**0.85**	**0.72**
Low Grade Stockpile				
Proven Reserve	2.5	6.6	0.42	0.55
Probable Reserve	-	-	-	-
Total	**2.5**	**6.6**	**0.42**	**0.55**
Reserve Including Low Grade				
Proven Reserve	6.6	21.3	0.70	0.64
Probable Reserve	2.3	8.6	0.89	0.80
Total	**8.9**	**29.9**	**0.76**	**0.68**

The Low Grade Stockpile has a cu-equivalent grade of 0.63% which is above the cut-off grade of 0.586% Cu-eq. Therefore it is part of the Reserve at $3.00/lb Cu and $1200/oz Au.

It should be noted here that the Oriental mineralisation that is above cut-off grade but outside the current pit has not been included in the Reserve estimate.

15.6 Life of Mine Production Schedule

The life of mine production schedule was prepared using Gemcom Minesched scheduling software and the results are summarised as shown in Table 15—8.

This schedule was developed using the current block model and the pit designs detailed in Section 15.4.2 of this report. The process plant feed rate was set at the current capacity of 4.0 Mtpa and the mining fleet capacity was set at 22 Mtpa for 2016/17 and then reduces as the final pit (Cut 3) deepens.

Table 15—8 Guelb Moghrein Life-of-Mine Production Schedule

		UNITS		TOTAL	2016	2017	2018	2019	2020	2021	2022	2023
MINING												
	Waste	Tonnes	Mt	**54.0**	18.9	18.2	11.7	2.2	2.0	1.0		
	Ore	Tonnes	Mt	**21.4**	3.0	3.8	3.6	3.8	4.1	3.0		
	Total Mined	Tonnes	Mt	**75.4**	22.0	22.0	15.4	6.0	6.2	4.0		
	Strip ratio		t:t	**2.5**	6.2	4.8	3.2	0.6	0.5	0.3		
PROCESSING SUMMARY												
	Feed to Plant	Tonnes	Mt	**29.9**	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.9
		Cu	%	**0.76%**	0.92%	0.92%	0.92%	0.78%	0.81%	0.58%	0.51%	0.42%
		Au	g/t	**0.68**	0.72	0.75	0.73	0.72	0.70	0.63	0.60	0.55
	Plant Recovery	Cu	%	**89.9%**	92.1%	92.1%	92.2%	90.3%	88.5%	87.5%	87.5%	87.5%
		Au	%	**62.0%**	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
	Metal in Concentrate											
		Cu	Kt	**204.2**	33.9	34.0	34.0	28.1	28.6	20.4	17.9	7.2
		Au	koz	**407.5**	57.4	60.1	58.1	57.1	55.5	50.4	48.0	21.1

Note: Following the completion of open pit mining activities, ore feed to the plant comprises stockpile reclaim.

ITEM 16 **MINING METHODS**

16.1 Mining Methods

Mining takes place in a single open pit which has been split into three stages. The mining is by conventional drill/blast and load/haul activities. All of the materials currently mined require drilling and blasting. The mine is an owner-operated site for its core activities with a contract for the supply of explosives and blasting activities being undertaken by Bulk Mining Explosives from South Africa (BME Pty). The explosives are emulsions and blends of emulsion and ammonium prills mixed on site prior to loading.

MCM commenced mining in 2006 with a daily production rate of 17kt per day. The pit is currently 120 m deep and approximately 500 m x 800 m wide. The mining fleet was expanded twice to ramp up the daily production to 22 kt in 2009 and again in 2013/14 with the addition of a second PC2000 excavator, to the current capacity of more than 70 kt per day. At this projected mining rate and based on the latest updated Mineral Reserves as of December 2015 the pit will be completely mined out by mid-2020. The mining will be scaled down for stockpile rehandle and processing until the end of 2023, with minimum mining fleet and staff.

Table 16-1 Mining fleet as of December 2015

Qty	Description of Unit	Qty	Make/model
9	Excavators	5	Komatsu PC1250-7 Hydraulic Excavator
		1	Komatsu PC400-7 Rock breaker
		1	Komatsu PC450-7 Rock Breaker
		2	Komatsu PC2000-8
6	Drill Rigs	4	Cubex 1120
		2	Furukawa DCR20
18	Dump Trucks	18	Komatsu HD785 -7
2	Water Trucks	1	Komatsu HD785 -7
		1	Komatsu HD465-7
11	Ancillary Fleet	2	Komatsu 375A Track Dozer
		1	Komatsu 275A Track Dozer
		2	Komatsu WD600 Wheel Dozer
		3	Komatsu GD705 Motor Grader
		1	Caterpillar 14H Grader
		1	Caterpillar D8R Track Dozer
	Rehandle Fleet	1	Komatsu WA600 FEL

16.2 Mining Sequence

The mining sequence broadly follows the sequence of events as follows:

- Grade control drilling will delineate the ore zones;
- Blast patterns designed to reduce material throw and ore dilution along with a Blast Master planning process controls sequence of operation;
- Ore and waste are blasted and mined separately where possible as fragmentation requirements vary significantly;
- Waste is generally removed on each 6 metre bench prior to the mining of ore;
- The removal of waste in the successive cut-backs utilises planned bulk systems of operation and is generally done by the larger PC2000 excavators;
- Trim blasts and perimeter blasting are utilised to ensure pit wall profiles are cut to the correct angle and wall damage minimised;
- 120t class excavators (PC1250) load ore into the 90 tonne class truck (Komatsu 785) and ore is hauled from the pit to the ROM area (and where possible tipped directly into the crusher).

16.3 Mine Planning Considerations

16.3.1 Mine Design Parameters

The Mine design parameters are discussed and presented in section 15.2 of this report.

16.3.2 Production Reconciliations

As per the grade control process, ore mark outs are assigned evaluated grades from the grade control block model and are assigned to the digging and truck despatches for the respective ROM stockpiles and waste dumps. Similarly, each ROM stockpile tonnage and grade is monitored via depletions to the processing facility and additions from the mined material. Regular (monthly) pit surveying allows for accurate assignment of tonnes and grades mined and despatched to the respective destinations. Accordingly, feed to the plant is known and is verified with a milled measurement for reconciliation of tonnes and grade. Final metal generated as concentrate is reconciled back to the declared tonnes and grades. As the Resource model has recently been updated, there has been no reconciliation of new production carried out however reconciliation of the December 2015 Resource model against historical production indicates a reasonable correlation.

16.3.3 Mining Dilution and Recovery

Where possible, ore and waste are blasted and mined separately to minimise loss and dilution. Planned loss and dilution has been built in to the geological model by the use of block sizes matched to the SMU size. It has been estimated that this planned loss and dilution was approximately 3%. In previous models and Reserves estimates a mining loss of 5% and dilution of 5% at zero grade had been applied. As there is no valid method of determining unplanned loss and dilution and no new mining/processing data to compare against the model, it was decided to maintain the overall 5% loss and dilution estimates by adding a further 2% as unplanned loss and dilution. It is recommended that these values be reviewed at the end of 2016 after checking 12 months' worth of reconciliation data between the December 2015 geological model and the actual mine and plant production.

16.3.4 Geotechnical Engineering

As noted in Section 15.3.1, the pit design parameters used during for the Guelb Moghrein pit designs rare based on the latest update from independent Geotechnical Engineer Mike Turner of Turner Mining Consulting who visits site annually and reviews data from site on a monthly basis.

16.3.5 Mine Dewatering

To date only minimal water has been encountered in the pit. Where water is encountered, the pit is dewatered in advance using sumps in order to reduce pore pressures in the pit wall and maintain a safe and efficient mining operation.

16.4 Mining and Processing Schedules

The Guelb Moghrein mine has been moving more than 25 Mtpa for the last three years (27 Mt in 2015). Ore production and processing commenced in late 2006 and in 2015 the plant achieved the target production rate of 4 Mtpa.

The current LOM schedule runs until mid-2023 and has been developed using a series of 3 phases, designed such that ore will be exposed without requiring excessive stripped waste inventories. Currently ore is being mined from Phase 1 and Phase 2 is almost developed to the point that sufficient ore is exposed and available to be able to target higher grade ore feed to the plant from mid-2017 onwards. Waste movement in Phase 3 can also be delayed if necessary to conserve cash now without adversely affecting the ore feed later on. The geometry of the deposit is sufficiently well known that, provided waste mining is maintained in accordance with the schedules, ore exposure is not likely to be a problem.

The primary drivers of the schedule are minimising grade variations and meeting the ore feed targets. The mine and plant production schedule for the remaining life of the current pit, which is approximately 8 years, is shown in **Table 16-1**.

Table 16-1 Guelb Moghrein Life of Mine Schedule –December 31 2015

		UNITS		TOTAL	2016	2017	2018	2019	2020	2021	2022	2023
MINING												
	Waste	Tonnes	Mt	**54.0**	18.9	18.2	11.7	2.2	2.0	1.0		
	Ore	Tonnes	Mt	**21.4**	3.0	3.8	3.6	3.8	4.1	3.0		
	Total Mined	Tonnes	Mt	**75.4**	22.0	22.0	15.4	6.0	6.2	4.0		
	Strip ratio		t:t	**2.5**	6.2	4.8	3.2	0.6	0.5	0.3		
PROCESSING SUMMARY												
	Feed to Plant	Tonnes	Mt	**29.9**	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.9
		Cu	%	**0.76%**	0.92%	0.92%	0.92%	0.78%	0.81%	0.58%	0.51%	0.42%
		Au	g/t	**0.68**	0.72	0.75	0.73	0.72	0.70	0.63	0.60	0.55
	Plant Recovery	Cu	%	**89.9%**	92.1%	92.1%	92.2%	90.3%	88.5%	87.5%	87.5%	87.5%
		Au	%	**62.0%**	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
	Metal in Concentrate											
		Cu	Kt	**204.2**	33.9	34.0	34.0	28.1	28.6	20.4	17.9	7.2
		Au	koz	**407.5**	57.4	60.1	58.1	57.1	55.5	50.4	48.0	21.1

ITEM 17 **RECOVERY METHODS**

17.1 Process Description

Ore from the open pit mine and stockpiles is crushed, milled and then undergoes sulphide flotation to produce a copper-gold concentrate, which is shipped to offshore smelters (mainly in China). Figure 17-1 is a schematic of the Guelb Moghrein flowsheet.

17.1.1 Crushing and grinding

Material from mining is received at the primary crusher feed dump pocket and feeds directly to the primary gyratory crusher which is an Allis Chalmers 42-65 unit. Product material from the primary crusher at a nominal size of 80% < 130 mm is conveyed to the covered dome stockpile with 7,000t live capacity and a total capacity of more than 30,000 t. There is also an additional crushed ore stockpile outside of the dome that may be fed with a front-end loader (FEL) when required. Crushed ore is recovered from under the dome stockpile by two vibrating feeders onto a transfer conveyor which feeds material to the crushed ore mill feed bin located in the mill area.

The primary SAG mill is a new Outotec mill that was commissioned in 2014 and is operated in open circuit. It is fed by an apron feeder from the feed bin via two transfer conveyors to the SAG mill feed chute The feed to SAG 1 is cascade controlled typically at about 500 wtph to 550 wtph on a mill weight controller set at 240-260 tonnes.

From SAG 1 the ground material discharges onto a vibrating screen. The oversize has provision to be routed to either a small stockpile area from where it is reclaimed by FEL or is conveyed back to the mill surge bin feed conveyor. The undersize from SAG 1 discharge screen passes into a sump and from there is pumped to the discharge sump of BM3.

The ball mill discharge sump is thus fed with SAG 1 discharge screen undersize, ball mill discharge screen undersize and tailings from the Knelson concentrator circuit. This material is pumped to a 6 cyclones cluster, whose overflow reports to linear trash screens, whilst underflow reports to the ball mill. The ball mill steel rejects report onto a conveyor then a bunker, where they are loaded out by FEL.

17.1.2 Flotation

A Knelson concentrator is operated in the grinding circuit with the feed coming from the ball mill discharge sump via a dedicated pump and the tailings being returned. The gravity concentrate is transferred to the concentrate thickener.

The screened cyclone overflow pulp (P_{80} of minus 75µm) is then held in a rougher flotation feed surge tank before being pumped to the rougher flotation conditioning tank with addition of the sodium ethyl xanthate collector and frother. Rougher flotation consists of six 150 m^3 flotation cells where the concentrate subsequently undergoes three-levels of cleaning stages while the roughers are operated in open circuit with the flotation tails discharged from the circuit.

Rougher concentrate is conditioned again and subjected to a series of six 50 m^3 first cleaner flotation cells where all the concentrate goes to the second cleaning stage while the tailings is fed to another gold recovery gravity circuit with regrind. First cleaner concentrate is subjected to conditioning before being fed to the second cleaner flotation consisting of seven 10 m^3 flotation cells the concentrate generally then goes to the final cleaning stage of a column cell and third cleaner flotation, however the option is available to direct the concentrate from the first three cells direct to the concentrate thickener. The third cleaners consist of three banks of two 3 m^3 cells with the concentrate combined with the column concentrate and pumped to the concentrate thickener.

Pyrrhotite is depressed at the cleaning stages by the addition of lime to increase the pH. Second and third cleaner tails are pumped back to the first and second cleaner conditioning tanks, respectively.

First cleaner tails are pumped to a sump box coupled with two pumps going to two Falcon gravity concentrators. The gravity gold concentrates are pumped to the concentrate thickener. The Falcon tailings are pumped to hydrocyclones, with the underflow being reground using a vertimill to liberate more of the gold particles, and subsequently goes back to the gravity concentrators while the overflow is fed to further flotation in the scavenger circuit.

The feed to the scavenger flotation stage is first conditioned then goes to a series of seven scavenger flotation cells – one of 150 m^3 and six of 50 m^3. The concentrate of the first three scavenger cells goes back to the first cleaner conditioning tank while the rest of the concentrates is pumped back to the rougher conditioning tank. Scavenger tailing is discharged from the circuit along with the rougher tailings.

The plant is controlled using CITECT, an Outotec On Stream Analyser (OSA) with twelve streams analysed and the recent (March 2016) commissioning of an SGS APC Flotation Expert System.

17.1.3 Concentrate

Final flotation concentrate is dewatered using a thickener and 2 disc filter presses. The copper gold concentrate is then bagged into 2.1 tonne bulk bags and placed in containers. Twelve bags are loaded in to each 6m container for trucking to the port at Nouakchott.

17.1.4 Magnetite Plant

The processing facility was extended in late 2014 early 2015 by adding a tailings processing plant for the extraction of magnetite from the flotation plant tailings.

The flotation tailings is pumped from a surge tank with a 30 minute capacity and fed to four rougher wet low-intensity magnetic separators (WLIMS) with two magnetic drums each. The rougher magnetite concentrate is transferred to the magnetite regrind flotation circuit, whilst the non-magnetic materials then go to the final tailings thickener.

Rougher magnetic concentrate is mixed with the regrind ball mill discharge slurry and pumped to hydrocyclones for classification with an overflow P_{80} of minus 53µm and the underflow fed to the regrind ball mill.

Hydrocyclone overflow reports to rougher flotation with three 100 m^3 flotation cells. Flotation reagents being the same as the copper-gold flotation plant (collector - sodium ethyl xanthate and frother) are supplied by the current mixing and storage systems of the copper-gold plant.

The flotation cell concentrate is recycled back to the copper-gold flotation plant via the Falcon/vertimill circuit.

The tails of the reverse-magnetite flotation circuit are pumped to the cleaner WLIMS consisting of four modules of triple drums per unit with the magnetic product from the drums discharging into magnetite concentrate filter feed tank.

All nonmagnetic tailings report to the tailings thickener feed box. Whilst operational, the plant produced approximately 80tph of magnetite at a grade in excess of 69% Fe.

The water supply for the magnetite recovery plant utilises the existing operating facilities and does not require additional water than that already in the circuit.

Unfortunately following commissioning and production of approximately 50,000 wt of magnetite the plant was put on care and maintenance due to the significant fall in the iron ore price. Testwork is currently in progress to produce magnetite of high quality that may be used for the dense media industry for cleaning of coal production – with a significant price premium over standard magnetite pricing.

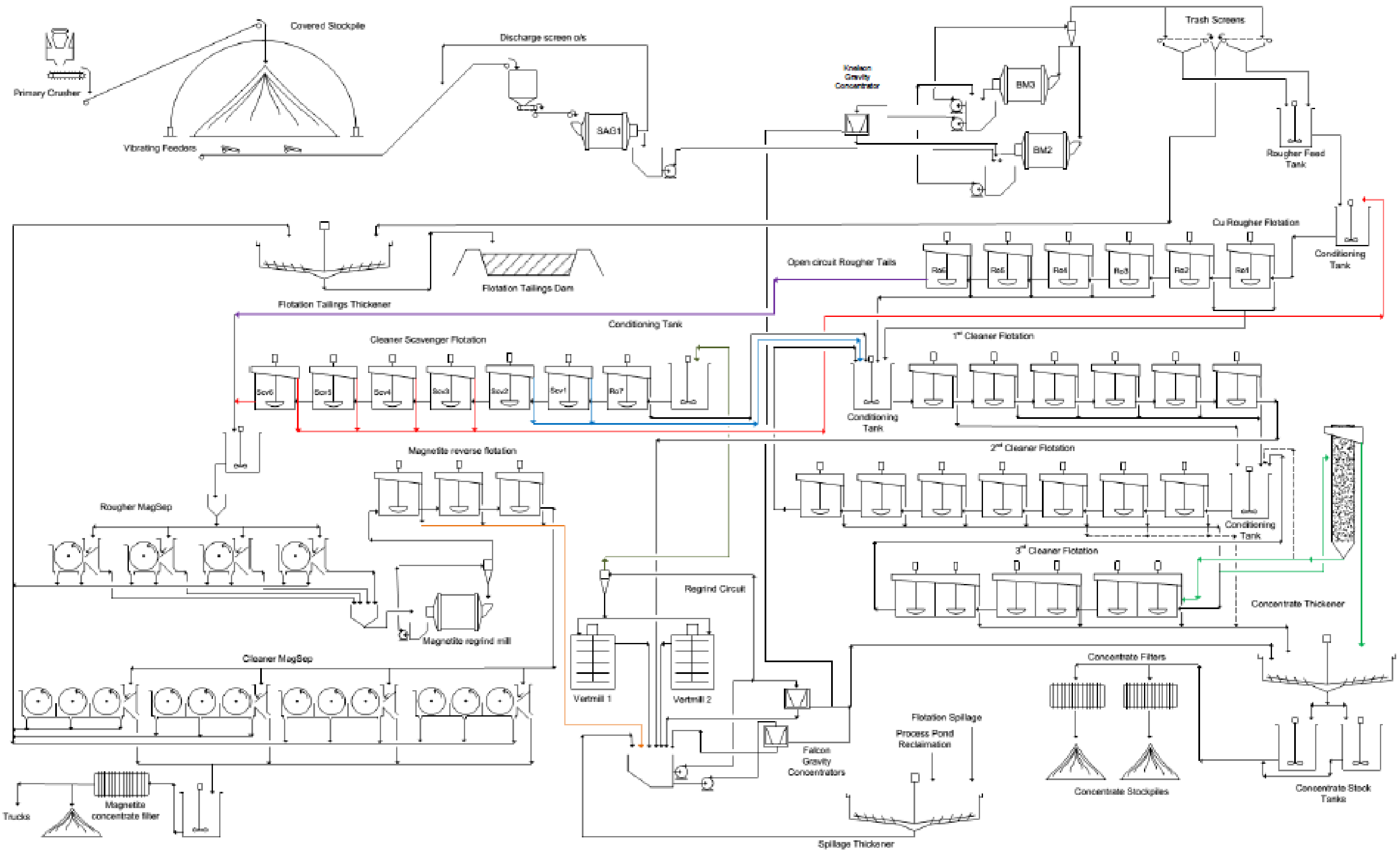
17.1.5 Tailings disposal

Guelb Moghrein has two active tailings storage facilities, TSF2 and TSF3. TSF2 was commissioned in September 2009, and TSF3 was commissioned in February 2015. Both are raised by the upstream deposition method using spigoted tailings. The dam supernatant is recycled to the process plant by means of a pump out decant.

Construction of a second TSF2 raise commenced in November 2012, however construction was discontinued due to the limited storage capacity required prior to the deposition of magnetite free tailings into a new TSF3 following commissioning of the magnetite processing plant in 2015. The magnetite processing plant was eventually put on care and maintenance later in 2015 and the TSF2 raise resumed. The raising of TSF2 is scheduled to be completed during Q1 2016 and will continue to be used as the main TSF for storage of magnetite-rich tailings.

As at the end of 2015, approximately 5.5 million tonnes of tailings had been deposited in the old TSF1, 17.3 million tonnes in TSF2 and 0.16 million tonnes in the new TSF3. Planned tailings production in 2016 is 3.80 million tonnes.

Figure 17-1 Flowsheet schematic



ITEM 18 **PROJECT INFRASTRUCTURE**

MCM have been operating the Guelb Moghrein mine since 2005 (over 10 years) and all the required infrastructure is in place and has been in use for a number of years. In fact, much of the Infrastructure was built by previous owners and operators of the mine and was in place prior to MCM's recommencement of mining and processing activities. Infrastructure currently includes:

- Open pit mine
- Flotation Processing facility
- CIL tailings storage facility;
- Waste rock dumps and ore stockpiles;
- Mine workshops and administration building;
- Two synchronised power generation stations;
- Explosives mixing plant and storage facility;
- Accommodation camp with messing facility as well as company owned housing in Akjoujt;
- Saline and potable water bore field at Bennichab, some 70Km away from the mine;
- Water storage reservoirs at site.

18.1 Roads and Transport

The property is accessed via a 250 km paved road which connects the capital Nouakchott with the town of Akjoujt. A 5 km gravel road connects Akjoujt with the mine site.

Nouakchott has an international airport with regular flights to Europe, and North and West Africa. Port facilities are available at Nouakchott and Nouâdhibou, with the latter being the export facility for Mauritania's iron ore production.

18.2 Power

The Guelb Moghrein mine has its own power station, using heavy fuel oil (HFO) as a fuel source. Where possible (street lighting etc), solar panels are used to supplement the power station supply.

18.3 Water

Guelb Moghrein's location in a dry region means that water is a critical supply item. Water is sourced from MCM's borefield in the Bennichab aquifer, 113 km to the southwest of the mine site. MCM pipes the water from this source for use at Guelb Moghrein and also supplies water to the town of Akjoujt.

ITEM 19 **MARKET STUDIES AND CONTRACTS**

MCM produces copper concentrate which also contains gold. The bulk of MCM product is sold to smelters in China. Commercial and sales arrangements are handled by Metal Corp Trading, a subsidiary of FQM. The off-take arrangements are subject to commercial confidentiality, however the base terms of these agreements have been utilized to develop the long term Mineral Reserves and cash flows.

Concentrate is bagged at site in 2t bags, then loaded in containers and trucked to the Port of Nouakchott from where it is shipped by Maersk line to customers in China. When gold doré is recovered through the CIL and/or gravity circuit, it is airfreighted from site via charters flight to Nouakchott where international air liners are used for export to Switzerland.

19.1 Contracts

As an operating mine MCM has a series of on-going contracts for the supply of various services, materials and consumables. These contracts are tendered and renewed as required on a regular basis.

The concentrate off-take contracts identified in section 19.1 are re-tendered and negotiated as needed to maintain an optimal commercial position for the mine.

ITEM 20 **ENVIRONMENTAL STUDIES, PERMITTING, SOCIAL AND COMMUNITY IMPACT**

MCM has operated to date and continues to operate under appropriate permits and regulation. Environmental liabilities associated with the site are those that would be expected from a mining site consisting of the open pit mine, process plant, waste dumps, tailing storage facilities, and exploration drilling sites. The site was subject to an environmental impact assessment prior to the commencement of the commercial production and has received all relevant permits and authorization. An environmental management plan was adopted prior to commercial production.

20.1 Approvals and Commitments

In November 2004, First Quantum Minerals Limited (FQM) acquired the Guelb Moghrein Mine. In a letter dated 22 August 2004 the Government of Mauritania indemnified FQM and MCM from responsibility for any environmental degradation or pollution caused by previous operators of the site.

In June 2005 all site environmental liabilities were documented by independent consultants in a report titled 'Guelb Moghrein Copper Gold Project, Environmental and Social Impact Assessment'. The existing environmental liabilities were principally present in the physical form of an open pit mine, waste rock dumps, magnetite tailings dump, redundant mill and gold plant, mining equipment, non-operational generators and transformers, various tailings dumps and buried asbestos dump, which appeared to have been abandoned by the previous mine operators without formal closure procedures.

Despite the indemnity, FQM made a commitment to clean-up the mine site where it was practicable and viable. A number of actions by FQM since 2004 have significantly reduced environmental liabilities. The actions are summarised as follows:

- The Morak tailings dam and contaminated sub soil were removed and placed within the lined CIL gold tailings storage facility. The Morak tailings footprint has since been rehabilitated with indigenous vegetation;
- Waste rock was dumped on the old TORCO tailings with the main objective being reduction of dust pollution;
- Significant non-hazardous and hazardous waste including scrap metal and hydrocarbons have been removed from site and disposed of in accordance with acceptable standards.

The most recent environmental impact study at Guelb Moghrein Mine assessed the impact of the proposed magnetite circuit. This EIA was approved by the Mauritanian Government in June 2014.

20.2 Safety Performance

Generally the workforce requires education with respect to safety attitude, however and despite this, MCM has developed and successfully implemented a good safety training system culminating in a good safety record.

20.3 Social and Community Related Requirements

The mine continues to pursue its aim to make its presence in the region an opportunity for its host community and the country as a whole. The Inchiry region is among the poorest in the country. MCM has been actively involved in community development programs. Of high importance is the restoration of the regional General Hospital, support to the community in the form of medicines, hospital equipment staffing and maintenance, funding of an HIV/AIDS awareness campaign, sponsoring national vaccination day, and many others.

In 2010 MCM commenced the renovation of some 260 km of the Nouakchott Akjoujt paved road. The mine also supplies running water to the town of Akjoujt as well as to the nomad population who keep livestock and live along the water supply pipeline from Bennichab.

As part of a capacity building program, MCM supports education in the region by funding the school renovation program, sponsoring a bursary for a local graduate, and lately the construction of a mining technician school in Akjout. Since 2005, MCM has spent more than $50 M on community development and social programmes.

As noted in the Archaeology section below, the Company has agreed to work with French authorities and academics in the CUPRUM project. One of the aims being to preserve the cultural patrimony of the Inchiri region and to create further development sustainability support by encouraging activities which can generate substantial incomes for people in the region. The first site visit related to the project was completed in 2015 with another site visit planned in mid-2016.

20.4 Archaeology

All archaeological sites identified prior to the commencement of production by MCM in 2006 have been investigated by a registered archaeological company. It is known that there was prehistorical mining activity around the site and in 2015 a new project (CUPRUM) involving co-operation with French archaeologists aims to investigate and highlight the mining history in the region.

20.5 Mine Closure Provisions

An independent Closure Plan was completed at the end of 2014. The Closure Plan included all environmental liabilities and not only those associated with activities after 2004. The Closure Plan for Guelb Moghrein Mine estimated that $ 15.7 million was required for planned closure and $ 20.2 million was required for rehabilitation.

20.6 Reclamation and Clean-up Activities

Prior to commissioning of TSF2, sulphide tailings were stored in a circular side-hill paddock type dam covering an area of 1.2 km^2 (TSF1). The tailings in this old storage facility will be reclaimed and processed at the end of mine life to recover the contained gold, copper and magnetite.

Reclamation of the old Morak gold tailings dam was completed in 2015. The tailings and contaminated sub soil was moved to the new CIL gold tailings storage facility. Rehabilitation of the Morak Tailings Dam covering 10.8 hectares was also completed during 2015. About 150 trees of local species (Acacia Flava) were planted in the area as part of the final rehabilitation plan. Acacia Flava has an excellent tolerance to dry condition. This program of rehabilitation will be continue with the additional planting of other local plant species.

Furthermore, rehabilitation of 7 ha of TORCO area (1970s processing; refer to Item 6.1) continued during 2015 with the main objective being reduction of dust pollution. The rehabilitation work entailed covering the area with waste rock.

Work to remove waste hydrocarbons produced by previous owners was also undertaken during 2015. 90% of the inventory and containers (mainly steel drums) has been removed from site by contractors for treatment in Europe and Senegal; the balance will be completed in Q1 2016. A rehabilitation of the area will then commence, with completion scheduled for Q3 2017.

ITEM 21 CAPITAL AND OPERATING COSTS

21.1 Capital Costs

The Guelb Moghrein copper mine has been operating for 10 years and there are no major capital expenditures planned at this point in time. Replacement of mining equipment and major processing plant components has been factored in to the operating costs used in this review.

As mentioned in other sections of this report, there are projects commencing in 2016 which may result in extending the mine life. These projects are of too early a stage to have capital allocated to them.

21.2 Operating Costs

The operating costs used in the cashflow summary in Item 22 of this report are based on actual costs from mining and processing activities up to and including December 2015 as well forecast costs taken from the MCM 2016 Budget/Five Year Forecast.

Table 21-2 Summary of Operating Costs by Cost Area for 2016 (basis for Life of Mine)

Ore processed	4.0	Mtpa	
Copper produced	34,000	Tonnes	
Gold produced	57,000	Ounces	
Cost Area	Annual Cost (US$1,000's)	Unit	Unit costs
Mining	26,700	US$/t mined	2.10
Processing	64,900	US$/t ore	16.24
G&A (incl Environment)	43,700	US$/t ore	10.92
Royalties	6,400	US$/t ore	1.59
		US$/lb Cu	0.08
TC and RC	30,600	US$/t ore	6.76
		US$/lb Cu	0.014

Note: Some numbers may not add up due to rounding

In pit optimisation terms, the Royalties along with the Treatement and Refining charges are referred to as metal costs (Item 15.1.2). Also the optimisation specifically included product transport charges as metal costs. In the cost model based on Actual and Budget cost items, the concentrate transport charges are part of a haulage contract and included in operating costs (concentrate is back-hauled by trucks bringing supplies to the mine).

21.2.1 Mining costs

The mining costs developed for the 2016 Budget were based on actual cost data (split by bench and stage) as well as haul profiles developed monthly for 2016 and quarterly for the remoander of the schedule. The budget mining cost takes account of:

- fuel consumption for drilling rigs, shovels/excavators and trucks
- tyre consumption for trucks
- explosives and mining equipment maintenance consumables
- operator wages
- maintenance
- trolley-assist waste haulage from mid-2016 onwards

21.2.2 Processing and G&A costs

Process and G&A operating cost inputs were also based on the detailed review of actual costs incurred in 2015 as well as the 2016 Budget costs. Table 21-3 below lists the inputs for the fixed component of the G&A costs.

Table 21-3 Fixed Cost Detail (basis for Optimisation and Life of Mine)

Cost_Area	Annual Cost (US$1,000's)	Unit costs (US$/t ore)
Administration/Overhead	28,499	
Dewatering	29	
Grade Control	1,606	
Total	30,133	7.53

Note: Some numbers may not add up due to rounding

ITEM 22 **ECONOMIC ANALYSIS**

The operating cost parameters used for pit optimisation (described in Section 15.1) and the physical mining schedule tabled in Section 15.6 were used to develop a simple cash flow model as summarised in Table 22.1. Funding costs, depreciation and company taxes are excluded from this model

Table 22.1 Cash Flow Summary – Guelb Moghrein Project

		UNITS		TOTAL	2016	2017	2018	2019	2020	2021	2022	2023
MINING												
	Waste	Tonnes	Mt	**54.0**	18.9	18.2	11.7	2.2	2.0	1.0		
	Ore	Tonnes	Mt	**21.4**	3.0	3.8	3.6	3.8	4.1	3.0		
	Total Mined	Tonnes	Mt	**75.4**	22.0	22.0	15.4	6.0	6.2	4.0		
	Strip ratio		t:t	**2.5**	6.2	4.8	3.2	0.6	0.5	0.3		
PROCESSING SUMMARY												
	Feed to Plant	Tonnes	Mt	**29.9**	4.0	4.0	4.0	4.0	4.0	4.0	4.0	1.9
		Cu	%	**0.76%**	0.92%	0.92%	0.92%	0.78%	0.81%	0.58%	0.51%	0.42%
		Au	g/t	**0.68**	0.72	0.75	0.73	0.72	0.70	0.63	0.60	0.55
	Plant Recovery	Cu	%	**89.9%**	92.1%	92.1%	92.2%	90.3%	88.5%	87.5%	87.5%	87.5%
		Au	%	**62.0%**	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%	62.0%
	Metal in Concentrate											
		Cu	Kt	**204.2**	33.9	34.0	34.0	28.1	28.6	20.4	17.9	7.2
		Au	koz	**407.5**	57.4	60.1	58.1	57.1	55.5	50.4	48.0	21.1
REVENUE SUMMARY												
	Metal Prices											
	(Source Dec 2015 Consensus)	Cu	$/lb		2.40	2.44	2.65	2.81	2.93	3.00	3.00	3.00
		Au	$/oz		1,158	1,159	1,159	1,153	1,200	1,200	1,200	1,200
REVENUE			$M	**1,699.9**	**245.5**	**253.0**	**265.6**	**240.2**	**251.3**	**195.2**	**176.0**	**73.1**
CAPITAL COSTS												
	Development capex		$M	**0.0**								
	Expansion capex		$M	**27.4**	27.3	0.1		0.1				
	Sustaining capex		$M	**0.0**								
	Closure and reclamation		$M	**35.9**							20.2	15.7
	subtotal		**$M**	**63.3**	**27.3**	**0.1**	**0.0**	**0.1**	**0.0**	**0.0**	**20.2**	**15.7**
OPERATING COSTS												
	Mining		$M	**157.0**	26.7	51.8	40.9	22.9	8.4	6.4		
	Processing		$M	**483.8**	64.9	64.5	64.6	64.6	64.6	64.6	64.6	31.4
	Site Administration		$M	**102.4**	13.7	13.6	13.7	13.7	13.7	13.7	12.2	7.9
	Other Direct Costs		$M	**192.9**	30.0	23.1	27.1	23.5	27.2	23.5	27.2	11.2
	subtotal		**$M**	**936.2**	**135.3**	**153.0**	**146.4**	**124.8**	**113.9**	**108.3**	**104.0**	**50.4**
METAL COSTS												
	Royalty		$M	**48.4**	6.4	7.2	8.2	7.3	7.5	5.2	4.7	1.9
	Treatment Charges		$M	**117.1**	20.7	20.5	20.3	16.1	16.7	10.2	9.0	3.6
	Refining Charges		$M	**56.4**	9.9	9.9	9.9	7.8	8.0	4.9	4.3	1.7
	subtotal		$M	**221.9**	**37.0**	**37.6**	**38.4**	**31.2**	**32.3**	**20.3**	**17.9**	**7.3**
CASHFLOW (Undiscounted)			**$M**	**478.5**	**45.9**	**62.3**	**80.8**	**84.2**	**105.1**	**66.6**	**33.9**	**-0.3**

The evaluation shows that the Guelb Moghrein mine has an undiscounted cashflow (not including taxes) of US$479 Million. Applying a 10% discount to the cashflow results in an NPV (prior to taxes and non-cash adjustments) of US$365 Million.

Sensitivity analyses carried out on metal prices and mining costs and their impact on NPV have provided the following results:

Table 22.2 Sensitivity of Metal Prices and Operating Costs on Cashflow

	+20%	Base	-20%
Copper Price $3.00/lb Base	$722.6 M	$478.5 M	$234.3 M
Operating Costs $1.80/t Base	$291.3 M	$478.5 M	$665.7 M

The Project is robust and relatively sensitive to both metal prices and operating costs. It is less sensitive to fluctuations to the variable portions of individual cost components (Mining Costs and/or Processing Costs)

ITEM 23 ADJACENT PROPERTIES

Exploration completed by the Company includes several campaigns focused on targeting mineralisation opportunities in the areas adjacent to the Guelb Moghrein deposit, within the Concession area. Results have sterilised these immediate surrounds for any deposits of similar or larger size to Guelb Moghrein. Hence, at the time of writing this report, there are no other projects or any significant exploration programs on the ground immediately adjacent to Guelb Moghrein.

In relation to the additional five exploration concessions held by the Company and totalling 5,581 km^2, the geology and mineralisation within these concessions is not considered to be material to the subject of this Technical Report.

ITEM 24 **OTHER RELEVANT DATA AND INFORMATION**

The QP’s are not aware of any relevant data or information not already presented in this report.

ITEM 25 INTERPRETATIONS AND CONCLUSIONS

25.1 Mineral Resource Modelling and Estimation

The updated Guelb Moghrein Mineral Resource estimate, subject of this report, uses all available drillhole data, including all diamond drill hole sample assay results, reverse circulation hole sample results and with blast hole sample data used to guide mineralisation volumes. In addition, the estimate is under-pinned by an improved interpretation of the prevailing geology that is now more relevant to the spatial distribution of copper and gold mineralisation. In-pit exposure of the geology and mineralisation has supported the local geology understanding and models. Interpolation parameters used during block estimation were based upon geostatistical and spatial analysis (variography) of the data coded to the geology domains and their volumes of mineralisation. The updated Mineral Resource estimates were classified according to geological continuity, QAQC, density data, drillhole grid spacing, grade continuity and confidence in the panel grade estimate. The Mineral Resource statement, depleted to 31st December 2015, has been reported in accordance with the guidelines of the Australasian JORC Code (JORC, 2012), which in turn complies with the Standards on Mineral Resources and Reserves of the Canadian Institute of Mining, Metallurgy and Petroleum (the CIM Guidelines, 2014).

25.1.1 Uncertainty and risk

In respect of the Mineral Resource estimate, and the opinion of David Gray (QP), the classifications applied to the estimates at Guelb Moghrein accurately reflect the confidences in the geological model and grade estimates.

Resources classed as Inferred were located along the deposit extremities where drillhole grid spacing was more than 100 m away. However, Inferred Mineral Resources only comprise 5% of the total available Mineral Resource, and therefore pose a low risk to the available mineralisation at Guelb Moghrein. Of the total resource, approximately 50% has been categorised as Indicated Mineral Resources which will benefit from improved confidence in the geology model and additional infill drillhole data.

Compared with the previous estimate, this updated Mineral Resource estimate has increased the tonnes and grades as guided by:

1. Additional diamond and reverse circulation drilling and sampling completed since the previous estimate as infill and extension at Oriental and Occidental deeps
2. Further development of the Oriental deposit
3. In-pit exposures and pit geology mapping of lithology and structure
4. Use of blast hole sample data for better definition of mineralised volumes
5. Improved understanding in geological and grade continuity has resulted in additional mineralisation domains, which in turn allow for more robust variography and robust block grade estimates
6. Improvement of estimation methods from improved geostatistics, block dimensions, sample selection routines

25.2 Mineral Reserve Estimation

The data is adequate to support the Mineral Reserve estimates using the categories of Mineral Reserve estimates permitted under NI 43-101 within the designed final pits and based upon Measured and Indicated Resources only.

25.2.1 Uncertainty and Risk

The Operation has been running for more than ten years and many of the operational parameters for the open pit and process plant, including recoveries and costs, are known. In respect of the Mineral Reserve estimate, and the opinion of Tony Cameron (QP), the classifications applied to the estimates at Guelb Moghrein accurately reflect the confidences in the Resource model and operational parameters and are deemed to be a low risk.

25.2.2 Mining

The mine footprint has expanded to the final pit limits and the final pushback is being developed in order to maintain ore supply for the life of mine. Production targets are being met and MCM has sufficient equipment on site to meet the future targets. The only issue in relation to mining, is blast performance. This has been found to be a product related issue and MCM is working with the supplier to resolve the issue. With respect to slope stability, the wall rock is competent and management systems are in place. The risk in relation to the mining activities at the Guelb Moghrein Mine is considered to be low.

25.2.3 Processing

Since commissioning, the Process plant has undergone several changes with the most significant being the increase in throughput from 2 Mtpa to 4 Mtpa following the installation of a new Outotec SAG Mill. Flow-sheet changes in the flotation circuit to handle the increased throughput along with the OSA analysing additional streams has enabled the copper recoveries to be maintained with lower feed grades and reduced residence time in the flotation circuit. In addition the introduction of the centrifugal gravity concentrators has enabled the gold recovery to be significantly improved – with further opportunities available as detailed in the recent gold deportment analysis.

With current management focussing on improving recoveries for both copper and gold with a strong ethos to reduce costs. Whilst a CIL plant was commissioned in 2008 and a magnetite plant was commissioned in 2015, both of these plants are currently idle as they are not economic to run under current commodity prices.

25.2.4 Environmental Compliance

The most recent environmental impact study at Guelb Moghrein assessed the impact of the magnetite circuit addition in early 2014. This EIA was approved by the Mauritanian Government in June 2014. To date MCM has met all obligations and commitments with respect to Environmental compliance. The environmental risk of the Guelb Moghrein Mine is considered to be low.

25.2.5 Social and Political Risk Management

The social and community risk of the Guelb Moghrein Mine is considered to be low.

25.2.6 Economic Sensitivity Analysis

The Guelb Moghrein mine is relatively robust and remains cashflow positive under conditions less favourable than being currently experienced. The economic risk of the Guelb Moghrein Mine is considered to be low.

25.2.7 Project Enhancement Studies

Mining of the Oriental deposit as a sulphide pit has been shown to be potentially economic using the input parameters developed for and described in this report. A review of this option has commenced.

ITEM 26 **RECOMMENDATIONS**

26.1 Geology and Mineral Resource estimation recommendations

Recommendations for continuous improvement in confidences of the Guelb Moghrein Mineral Resource estimates include:

- Continue with additional infill and extensional drilling in the near pit and deeper extension areas in order to improve confidence of Indicated Resources estimates
- Develop confidence in the Oriental Mineral Resources
- Continue to improve upon quality sampling, analysis and QAQC routines for drilled samples
- Develop the deposits 3D structural framework model for improved domaining and extensional targeting.

26.2 Mineral Reserve Estimation and Mining

The following recommendations have been developed during the course of writing this report:

- Continue to refine mine designs based on ongoing Geotechnical reviews.
- In order to maintain and improve operational standards, quarterly reviews of the pit end of month surveys are undertaken to monitor the accuracy of mining with respect to mine designs. The reviews have shown a marked improvement in floor level control over the years however, there is still room to improve further.
- Continue extensional drilling studies (Oriental and Occidental deeps) to extend mine life.

26.3 Processing

With the operation currently at a mature stage the following areas for improvements are in progress:

- Alternative flotation reagent trials optimise pyrrhotite depression;
- Additional Knelson by the Q3 2016;
- Investigation into gravity concentrate processing options to produce bullion;
- Testwork and subsequent plant trial is currently in progress to produce magnetite of high quality that may be used for the dense media industry for cleaning of coal production – with a significant price premium over standard magnetite pricing;
- Investigation on additional column cell in the final cleaning state.

26.4 Environment

The Government of Mauritania has indemnified FQM and MCM from responsibility for any environmental degradation or pollution caused by previous operators of the site. Nevertheless, FQM has made a commitment to clean-up the mine site where it is practicable and viable. Some of this work has been completed it is recommended that MCM aims to continue to meet the commitment.

26.5 Project Enhancement Studies

With near-mine infill and extensional drilling commencing in 2016, MCM is actively seeking to extend the life of the Project. The primary aims are to further evaluate the Oriental deposit as well as identify and assess open pit and underground opportunities (both as extensions to the current pit or as satellite projects). A tailings retreatment project is also being investigated and is primarily focussed on tailings from the early phases of mining and processing (i.e. prior to 2012).

It is recommended that preparation for the enhancement projects is completed as soon as possible so as to allow for expenditure on enhancement projects to be included in the 2017 annual budget (due September 2016).

ITEM 27 **REFERENCES**

Bargmann, C. J. and Dominy, S. C., (2008), *Technical Report on the Mauritania Copper Mines: Guelb Mogherin resource estimation Project No. L00131.* NI 43-101 Technical Report for Mauritania Copper Mines by Snowden Mining Industry Consultants Limited.

CIM (2010). *CIM Definition Standards on Mineral Resources and Mineral Reserves*. Prepared by the CIM Standing Committee on Reserve Definitions (adopted by CIM council 11-Dec-05).

Hitzman, M.W., Oreskes, N. and Einaudi, M.T. (1992). *Geological characteristics and tectonic setting of Proterozoic iron oxide (Cu-U-Au- REE) deposits*. Precambrian Research, 58, pp 241 287.

Hitzman, M. W. (2002). *Iron Oxide-Cu-Au Deposits: What, Where, When and Why.* In Porter T. M. (Ed), Hydrothermal Iron Oxide Copper- Gold & Related Deposits: A Global Perspective, Vol 1, 2nd Edition. PGC publishing, Adelaide. p. 9-25.

Independent Metallurgical Laboratories Pty. Ltd. (2005). *Project No. 2169: Metallurgical Ore Characterisation of Guelb Moghrein Copper Ore for First Quantum Minerals Ltd.,* August 2005.

JORC (1996). *Australian Code for Reporting of Identified Mineral Resources and Ore Reserves*, July 1996.

Kirschbaum, M. (2007). *Summary of 2007 Summer Field Work*. Unpublished internal Powerpoint presentation

Kolb, J., Sakellaris, G. A. and Meyer, F. M. (2006a). *Controls on hydrothermal Fe oxide-Cu-Au-Co mineralisation at the Guelb Moghrein deposit, Akjoujt area, Mauritania.* Mineralium Deposita, 41, 68-81.

Kolb, J., Sakellaris, G. A. and Meyer, F. M. (2006b). *Shear zone controlled IOCG mineralisation: the Guelb Moghrein deposit, Akjoujt, Mauritania*. Unpublished Powerpoint presentation.

Martyn, J. and Strickland, C. (2004). *Stratigraphy, structure and mineralisation of the Akjoujt area, Mauritania*. Journal of African Earth Sciences, 38, pp 489 503.

Turner, M. (2013). *Updated Guelb Moghrein Slope Design Guidelines.* Report to MCM, July.

White, G. and O'Connor M., (2012). *Summary Report on the Mineral Resource Estimate Update: Guelb Moghrein Copper- Gold Deposit Mauritania for First Quantum Minerals* (Unpublished Report By CSA Global UK Ltd, 20 pp.)

ITEM 28 **CERTIFICATES**

David Gray
First Quantum Minerals Ltd
24 Outram St, West Perth, Western Australia, 6005
Tel +61 8 9346 0100; david.gray@fqml.com

I, David Gray, do hereby certify that:

1. I am the Group Mine and Resource Geologist employed by First Quantum Minerals Ltd.
2. This certificate applies to the technical report entitled "Guelb Moghrein Copper Gold Mine, Inchiri, Mauritania, NI 43-101, Technical Report", dated effective 30th March 2016 (the "Technical Report").
3. I am a professional geologist having graduated with a Bachelor of Science degree with Honours (1988) in Geology from Rhodes University in Grahamstown, South Africa.
4. I am a Member of the Australasian Institute of Mining and Metallurgy and a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP).
5. I have worked as a geologist for a total of twenty six years since my graduation from university. I have over 16 years experience in production geology, over 5 years of exploration management of precious, base metal and copper deposits. During the last ten years I have consulted to and held senior technical mineral resource positions in copper mining companies operating in Central Africa and worldwide.
6. I have read the definition of "qualified person" as set out in National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I am a "qualified person" for the purposes of NI 43-101.
7. I most recently personally inspected the Guelb Moghrein property described in the Technical Report in November 2015.
8. I am responsible for the preparation of those portions of the Technical Report relating to geology, data collection, data analysis and verification and Mineral Resource estimation (namely Items 7 to 12 and 14).
9. I am not independent (as defined by Section 1.5 of NI 43-101) of First Quantum Minerals Ltd.
10. I have had prior involvement with the property that is the subject of the Technical Report. The nature of my prior involvement has been in the assurance of sampling QAQC, optimisation of estimation methods and the development of geology and mineralisation models.
11. I have read NI 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.
12. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required for it to be disclosed and to make the Technical Report not misleading.

Signed and dated this 30th day of March, 2016 at West Perth, Western Australia, Australia.

David Gray

Tony Cameron
Cameron Mining Consulting Ltd
20/F Central Tower, 28 Queen's Road, Central, Hong Kong
Tel +86 13521513186; tony@cameronmining.com

I, Tony Cameron, do hereby certify that:

1. I am a Consultant Mining Engineer employed by Cameron Mining Consulting Ltd.
2. This certificate applies to the technical report entitled "Guelb Moghrein Copper Gold Mine Inchiri, Mauritania, NI 43-101, Technical Report", dated effective 30th March 2016 (the "Technical Report").
3. I am a professional mining engineer having graduated with an undergraduate degree of Bachelor of Engineering (Mining) from the University of Queensland in 1988. In addition, I have obtained a First Class Mine Manager's Certificate (No. 509) in Western Australia, a Graduate Dilpoma in Business from Curtin University (Western Australia) in 2000, and a Masters of Commercial Law from Melbourne University in 2004.
4. I am a Fellow of the Australasian Institute of Mining and Metallurgy.
5. I have worked as a mining engineer for a period in excess of twenty five years since my graduation from university. Over the last fifteen years I have worked as a consulting mining engineer on mine planning and evaluations for base metals operations and development projects worldwide.
6. I have read the definition of "qualified person" as set out in National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I am a "qualified person" for the purposes of NI 43-101.
7. I most recently personally inspected the Guelb Moghrein property described in the Technical Report in January 2015.
8. I am responsible for the preparation of those portions of the Technical Report relating to Mineral Reserve estimation and Mining, namely Items 15 and 16, respectively. I am also responsible for the preparation of those items of the Technical Report not covered specifically by the other qualified persons which are Items 1 to 6 and 18 to 28.
9. I am independent (as defined by Section 1.5 of NI 43-101) of First Quantum Minerals Ltd.
10. I have not had prior involvement with the property that is the subject of the Technical Report.
11. I have read NI 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.
12. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required for it to be disclosed and to make the Technical Report not misleading.

Signed and dated this 30th day of March, 2016 at West Perth, Western Australia, Australia.

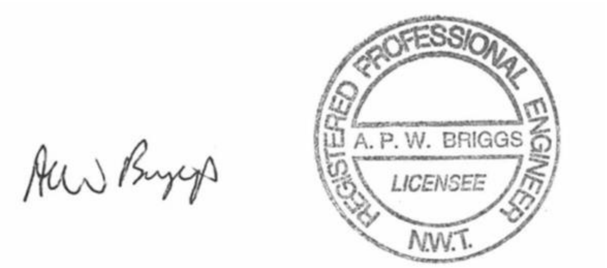
Tony Cameron

Andrew Briggs
First Quantum Minerals Ltd
24 Outram St
West Perth, Western Australia, 6005
Tel +61 8 9346 0100; andrew.briggs@fqml.com

I, Andrew Briggs, do hereby certify that:

1. I am the Group Consulting Project Metallurgist employed by First Quantum Minerals Ltd.
2. This certificate applies to the technical report entitled "Guelb Moghrein Copper Gold Mine, Inchiri, Mauritania, NI 43-101, Technical Report", dated effective 30th March 2016 (the "Technical Report").
3. I am a professional metallurgist having graduated in 1974 from the Imperial College (Royal School of Mines), London, with a BSc (Eng) First Class in Metallurgy.
4. I am a Fellow of the Southern African Institute of Mining and Metallurgy, and am a Professional Engineer licenced by NAPEG (#L770) – the Association of Professional Engineers, Geologists and Geophysicists of the Northwest Territories (and Nanavut), Canada.
5. I have worked as a process engineer and metallurgist since graduation in 1974 (41 years); the first 13 years of which were in operating positions up to Metallurgical Manager in the gold mining industry. This was followed by 19 years in engineering companies in Process Design for projects worldwide, and finally 9 years with First Quantum Minerals Ltd as a Process Consultant.
6. I have read the definition of "qualified person" as set out in National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I am a "qualified person" for the purposes of NI 43-101.
7. I most recently personally inspected the Guelb Moghrein property described in the Technical Report in June 2014.
8. I am responsible for the preparation of those portions of the Technical Report relating to mineral processing/metallurgical testing and recovery methods, namely Items 13 and 17, respectively.
9. I am not independent (as defined by Section 1.4 of NI 43-101) of First Quantum Minerals Ltd.
10. I have been involved with the property that is the subject of the Technical Report, since inception. This work has included metallurgical testwork, process design for the plant and associated infrastructure, project planning, and engineering studies.
11. I have read NI 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with that instrument and form.
12. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required for it to be disclosed and to make the Technical Report not misleading.

Signed and dated this 30th day of March, 2016 at West Perth, Western Australia, Australia.



Andrew Briggs