9.3.2 Cutoff Grade Analysis

RPM undertook a Whittle analysis using an individual ore type cut-off calculation in order to assess the pit optimization sensitivity associated to different cut-off grade strategies. The individual cut-off calculations are based on the different metallurgical recoveries as listed in ***Table 8-2***. RPM verified that the use of an internal constant 0.2% Cu cut-off grade to all ore types does not have a material effect on the minable quantities within the optimized pits. ***Tables 9-2, 9-3, and 9-4*** show a comparison between the two cut-off grade strategies.

Table 9-2 Ferrobamba Pitshell Comparison for Different Cut-off Grade Methods

Description	Quantity M tonnes	Cu % Cut-off	Strip Ratio	Cu %	Cu Mlbs	Mo %	Mo Mlbs	Ag gpt	Ag Mozs	Au gpt	Au Mozs
RPM Pitshell[2]											
Total Ore	**724**	**0.20**	**-**	**0.72**	**11,523**	**0.02**	**330**	**3.88**	**90**	**0.07**	**2**
Total Waste	**1,698**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Pit	**2,422**	**-**	**2.34**	**-**	**11,523**	**-**	**330**	**-**	**90**	**-**	**2**
RPM Pitshell[3]											
Total Ore	**865**	**-**	**-**	**0.63**	**12,016**	**0.02**	**330**	**3.25**	**90**	**0.06**	**2**
Total Waste	**1,606**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Pit	**2,471**	**-**	**1.86**	**-**	**12,016**	**-**	**330**	**-**	**90**	**-**	**2**
Comparison											
Total Ore											
Difference	141	-	-	-	493	-	-	-	-	-	-
Percentage	19%	-	-	-	4%	-	0%	-	0%	-	0%
Total Waste											
Difference	(92)	-	-	-	-	-	-	-	-	-	-
Percentage	-5%	-	-	-	-	-	-	-	-	-	-
Total Pit											
Difference	48.8	-	-	-	-	-	-	-	-	-	-
Percentage	2%	-	-	-	-	-	-	-	-	-	-

Notes:
1) *Tonnage in metric tonnes*
2) *Cut-off Grade of 0.2% Cu applied to all oretypes*
3) *Cut-off Grade based on Cu, Mo, Ag and Au vary according to the metallurgical recovery for each oretype*

Table 9-3 Chalcobamba Pitshell Comparison for Different Cut-off Grade Methods

Description	Quantity M tonnes	Cu % Cut-off	Strip Ratio	Cu %	Cu Mlbs	Mo %	Mo Mlbs	Ag gpt	Ag Mozs	Au gpt	Au Mozs
RPM Pitshell[2]											
Total Ore	**325**	**0.20**	**-**	**0.58**	**4,141**	**0.01**	**95**	**2.11**	**22**	**0.03**	**0**
Total Waste	**530**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Pit	**855**	**-**	**1.63**	**-**	**4,141**	**-**	**95**	**-**	**22**	**-**	**0**
RPM Pitshell[3]											
Total Ore	**467**	**-**	**-**	**0.45**	**4,630**	**0.01**	**142**	**1.67**	**25**	**0.02**	**0**
Total Waste	**468**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Pit	**935**	**-**	**1.00**	**-**	**4,630**	**-**	**142**	**-**	**25**	**-**	**0**
Comparison											
Total Ore											
Difference	142	-	-	-	489	-	47	-	3	-	0
Percentage	44%	-	-	-	12%	-	49%	-	14%	-	6%
Total Waste											
Difference	(62)	-	-	-	-	-	-	-	-	-	-
Percentage	-12%	-	-	-	-	-	-	-	-	-	-
Total Pit											
Difference	79.8	-	-	-	-	-	-	-	-	-	-
Percentage	9%	-	-	-	-	-	-	-	-	-	-

Notes:
1) Tonnage in metric tonnes
2) Cut-off Grade of 0.2% Cu applied to all oretypes
3) Cut-off Grade based on Cu, Mo, Ag and Au vary according to the metallurgical recovery for each oretype

Table 9-4 Sulfobamba Pitshell Comparison for Different Cut-off Grade Methods

Description	Quantity M tonnes	Cu % Cut-off	Strip Ratio	Cu %	Cu Mlbs	Mo %	Mo Mlbs	Ag gpt	Ag Mozs	Au gpt	Au Mozs
RPM Pitshell[2]											
Total Ore	**113**	**0.20**	**-**	**0.63**	**1,583**	**0.01**	**36**	**4.88**	**18**	**0.02**	**0**
Total Waste	**266**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Pit	**380**	**-**	**2.35**	**-**	**1,583**	**-**	**36**	**-**	**18**	**-**	**0**
RPM Pitshell[3]											
Total Ore	**186**	**-**	**-**	**0.45**	**1,844**	**0.01**	**53**	**3.78**	**23**	**0.01**	**0**
Total Waste	**289**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Pit	**475**	**-**	**1.56**	**-**	**1,844**	**-**	**53**	**-**	**23**	**-**	**0**
Comparison											
Total Ore											
Difference	72	-	-	-	261	-	17	-	5	-	(0)
Percentage	64%	-	-	-	16%	-	47%	-	27%	-	-9%
Total Waste											
Difference	23	-	-	-	-	-	-	-	-	-	-
Percentage	8%	-	-	-	-	-	-	-	-	-	-
Total Pit											
Difference	94.8	-	-	-	-	-	-	-	-	-	-
Percentage	25%	-	-	-	-	-	-	-	-	-	-

Notes:
1) Tonnage in metric tonnes
2) Cut-off Grade of 0.2% Cu applied to all oretypes
3) Cut-off Grade based on Cu, Mo, Ag and Au vary according to the metallurgical recovery for each oretype

9.3.3 Mine Design Parameters

The mine design parameters are listed in ***Table 9-5***. The pit limits for Ferrobamba, Chalcobamba and Sulfobamba have been designed with 10% gradient ramps, which is optimal from the equipment selected.

Table 9-5 Mine Design Parameters

Item	Ferrobamba	Chalcobamba	Sulfobamba
Haul Road Width	35 m	35 m	35 m
Intermediate Ramp Grade	10 %	10 %	10 %
Final Limit Ramp Grade	10 %	10 %	10 %
Bench Height	15 m	15 m	15 m
Interramp Slope Angle	42° to 50°	49° to 58°	48°
Overall Slope Angle	35.4° to 45.4°	44.5° to 52.4°	40°
Number of Phases	4	2	1

Source: Provided by the Company.

Feasibility level geotechnical studies have been completed by the Company and have been utilised top derive the mine designs. The Company recognizes additional geotechnical evaluation and characterization by rock type is still required and therefore intends to construct the initial phase 1 development of Ferrobamba at shallower angles than suggested in the geotechnical study. Adjustments as appropriate to the intermediate phases and the final design will be made based upon further geotechnical evaluation, actual slope performance and any stability issues. Following a review of the geotechnical parameters, studies and subsequent mine design, RPM considers this approach reasonable and appropriate particularly given the long mine life of the Ferrobamba pit (21 years), RPM recommends that a review of the oxide slope angles be completed prior to the undertaken of the Chalcobamba and Sulfobamba pits which have a shorter life to minimise the waste movement.

RPM has review the current mine plans for the three deposits which will mined over 21 years commencing and considers that the pit limits and phases were designed with suitable level of detail taking into account the recommended geotechnical and mining operation parameters. ***Table 9-6*** presents a comparison analysis between the Whittle pit shells generated by RPM and the designed pits provided by the Company. A review of these results indicates that the whittle pits are consistent with the Companies final pit designs as such has utilised these final pits as the basis for the production schedule and results Ore Reserves as present in this Report.

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Table 9-6 Pitshell and Designed Pit Summary

Description	Ore M tonnes	Waste M tonnes	Cu % Cut-off	Strip Ratio	Cu %	Cu Mlbs	Mo %	Mo Mlbs	Ag gpt	Ag Mozs	Au gpt	Au Mozs
Ferrobamba												
RPM Pitshell[2]	724	1,698	0.20	2.34	0.72	11,523	0.02	311	3.75	87	0.07	2
Designed Pit[3]	657	1,426	0.20	2.17	0.73	10,625	0.02	281	3.82	81	0.08	2
Comparison												
Difference	(67)	(272)	-	-	-	(898)	-	(29)	-	(7)	-	(0)
Percentage	-9%	-16%	-	-	-	-8%	-	-9%	-	-8%	-	-8%
Chalcobamba												
RPM Pitshell[2]	325	530	0.20	1.63	0.58	4,141	0.01	95	2.11	22	0.03	0
Designed Pit[3]	235	311	0.20	1.33	0.66	3,432	0.01	70	2.44	18	0.03	0
Comparison												
Difference	(90)	(219)	-	-	-	(709)	-	(25)		(4)		(0)
Percentage	-28%	-41%	-	-	-	-17%	-	-26%		-16%		-18%
Sulfobamba												
RPM Pitshell[2]	113	266	0.20	2.35	0.63	1,583	0.01	36	4.88	18	0.02	0
Designed Pit[3]	60	127	0.20	2.12	0.86	1,138	0.02	20	6.65	13	0.02	0
Comparison												
Difference	(53)	(139)	-	-	-	(444)	-	(16)	-	(5)	-	(0)
Percentage	-47%	-52%	-	-	-	-28%	-	-45%	-	-28%	-	-34%
Total Deposits												
RPM Pitshell[2]	1,163	2,494	0.20	2.15	0.67	17,247	0.02	442	3.40	127	0.06	2
Designed Pit[3]	952	1,865	0.20	1.96	0.72	15,196	0.02	371	3.66	112	0.06	2
Comparison												
Difference	(210)	(630)	-	-	-	(2,051)	-	(71)	-	(15)	-	(0)
Percentage	-18%	-25%	-	-	-	-12%	-	-16%	-	-12%	-	-10%
Total Deposits												
RPM Pitshell[2]	1,163	2,494	0.20	2.15	0.67	17,247	0.02	442	3.40	127	0.06	2
Reserves Report[4]	950	-	0.20	-	0.73	15,292	0.02	419	3.70	113	0.06	2
Comparison												
Difference	(213)	-	-	-	-	(1,955)	-	(23)	-	(14)	-	(0)
Percentage	-18%	-	-	-	-	-11%	-	-5%	-	-11%	-	-12%

Notes:
1) Tonnage in metric tonnes
2) Cut-off Grade of 0.2% Cu applied to all oretypes
3) The Company's pit design with Cut-off Grade of 0.2% Cu applied to all oretypes
4) Resource & Reserves Report as at 31 December 2013 (http://www.glencorexstrata.com/assets/Investors/GLEN-2013-Resources-Reserves-Report.pdf)

9.3.4 Waste Dumps

All waste is planned to be stored on surface for the three pits or utilised in the construction of the tails deposit wall in the early years of the mine life. Waste dump design was completed taking into consideration the following features of the site area: area availability, potential location of the primary crusher, infrastructure location, tailing location, and pit geometry and topography.

The Project includes the construction of three dumps for Ferrobamba, two dumps for Chalcobamba, and one for Sulfobamba. Portions of the waste generated by the Ferrobamba pit will be utilised during the construction of the tailing deposit wall. ***Table 9-7*** presents the waste dump capacity for each pit.

Table 9-7 Waste Dump Capacity

Lift Elevation	Volume (Million Bank Cubic Meters)
Ferrobamba	
4,470	32.4
4,420	54.4
4,370	82.8
4,320	117.8
4,270	141.2
4,220	42.4
4,170	13.3
4,120	8.7
4,070	16.3
4,020	19.9
3,970	16.7
3,920	12.9
3,870	7.0
3,820	1.2
3,770	0.0
Total	**567.1**
Chalcobamba	
4,485	33.9
4,435	40.7
4,385	47.8
4,335	33.0
4,285	18.4
4,235	8.7
4,181	1.2
Total	**183.7**
Sulfobamba	
4,490	19.6
4,440	24.8
4,390	16.1
4,340	5.4
4,290	0.2
Total	**66.2**
Grand Total	**817.0**

Source: Provided by the Company.

9.3.5 Equipment Plan

Following a review of the planned production rates and haulage profiles of the Company within the open pit and the resultant truck and shovel requirements RPM considers that an additional 2 truck at the Ferrobamba pit will be required to ensure the rate can be meet planned rates. RPM considers the forecast equipment number (***Table 9-8***) is reasonable.

Table 9-8 Mine Equipment Requirements by Deposit

	Ferrobamba		Chalcobamba		Sulfobamba		Total	
Item	Years 1-2	Peak	Years 1-2	Peak	Years 1-2	Peak	Years 1-2	Peak
Loading units (various sizes)	6	6	0	2	0	1	6	6
Haulage Trucks (300t)	25	50	0	12	0	12	25	52
Drills	8	8	0	4	0		8	9
Auxilliary Equipment							22	22

Source: Provided by the Company however edited by RPM to suit the Ore Reserves Production Schedule.

RPM notes that with the exception of haul trucks, the Company has chosen multiple equipment vendors in contrast to focusing on one vendor and common spare parts between units. This applies to loading, drilling and auxiliary equipment (dozers). The haul trucks purchased are all Komatsu brand (930's of a 300-tonne size with standard, rather than light-weight, beds.

Maintenance will be performed by equipment vendors under a MARC contract. A dispatch system has been budgeted, and Project staff is currently evaluating options from various vendors.

9.3.6 Equipment Already On-site

Several Komatsu haulage trucks have been delivered to site and assembled, however they have not been put into operation yet since stripping has not yet begun. As part of the education and training program the Company plans to utilise some of these units for trainee development. This will be completed on a nearby platform located 1 km away from the mine area (due working limitations within the mine final limits).

9.4 Life of Mine Plan and Pit Sequence

The three deposits are physically shown in relation to one another and to the property's facilities in ***Figure 9-1***. The first pit to be developed and exploited is the Ferrobamba pit, which contained 657 Mt of Ore Reserves. Dual primary crushers will be constructed adjacent to the Ferrobamba pit (Section 10).

The second deposit to be developed and exploited is the Chalcobamba pit which contained 235 Mt of Ore Reserves with production commencing in Year 4. In Year 6, a third primary crusher will be constructed adjacent to the Chalcobamba pit. Ore mined from Chalcobamba prior to the third primary crusher construction will be hauled to the Ferrobamba primary crushers. Lastly, the Sulfobamba pit containing 60 Mt of Ore Reserves will be developed and exploited starting in Year 7. Ore from Sulfobamba pit will be delivered to the third primary crusher near to Chalcobamba. ***Figure 9-2*** shows the timing of the different ore sources throughout the mine life.

During the development of the pits a number of phases or push back are planned. These phases are planned to ensure consistent ROM ore is produced and minimise long period of waste mining. The current mine plans contains four pit or mining phases for Ferrobamba, two for Chalcobamba and one in Sulfobamba as shown in ***Figures 9-2 through 9-6***.

RPM highlights that as part of the Ferrobamba pit the majority of the watershed feeding the Ferrobamba River will need to be diverted prior to the river's interception. As such the Company has planned a diversion canal which appear to be reasonable capacity, RPM however does note that a detailed review has not been completed to ensure a proper construction sequence and an confirmation a major flooding event can be contained. The river diversion structures include the tailings dam, the canal upstream of the tailings dam and the contact (settlement) water pond.

9.5 Forecast Production

The Project production plan prepared by RPM is based on measured and indicated resources only and is shown in ***Table 9-9,*** and ***Figure 9-2*** and ***Figure 9-7***. Specifically, the design pit used was based on measured and indicated material, and the inferred resource that fell within the design pit was included in the waste category. Mine plans have been designed to provide higher than average grade early in the mine life, and lower than average grade late in the mine life. This is accomplished through a staggered introduction of mining from the three deposits in order to maximise cash flow early. ***Table 9-10, Table 9-11 and Table 9-12*** present the production plan breakdown by pit.

Based on the Ore Reserve estimate, the Pit Development Sequence and the Pit Designs the forecast mine life is approximately 21 years from 1st January, 2014. RPM considers that the proposed Life of Mine Development Sequence and Production Forecast to be reasonable and achievable based on the current mining equipment and designs. RPM does however recommend that further optimisation and short term planning. This optimisation should focus of the sequence of development in conjunction with capital expenditure and short term grade variability to maximise the profitability of the Project.

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Figure 9-2 Life of Mine Project Development Sequence

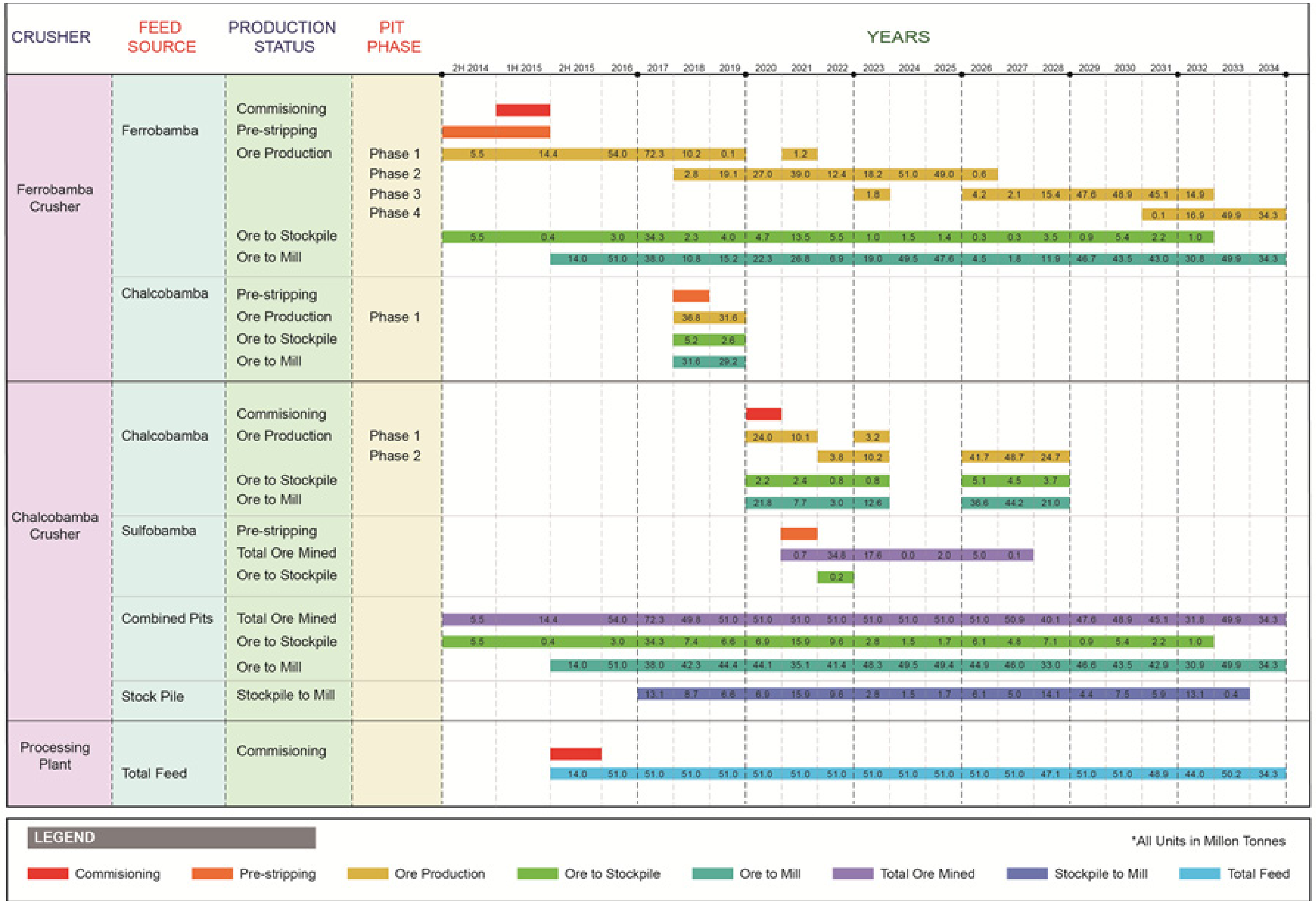

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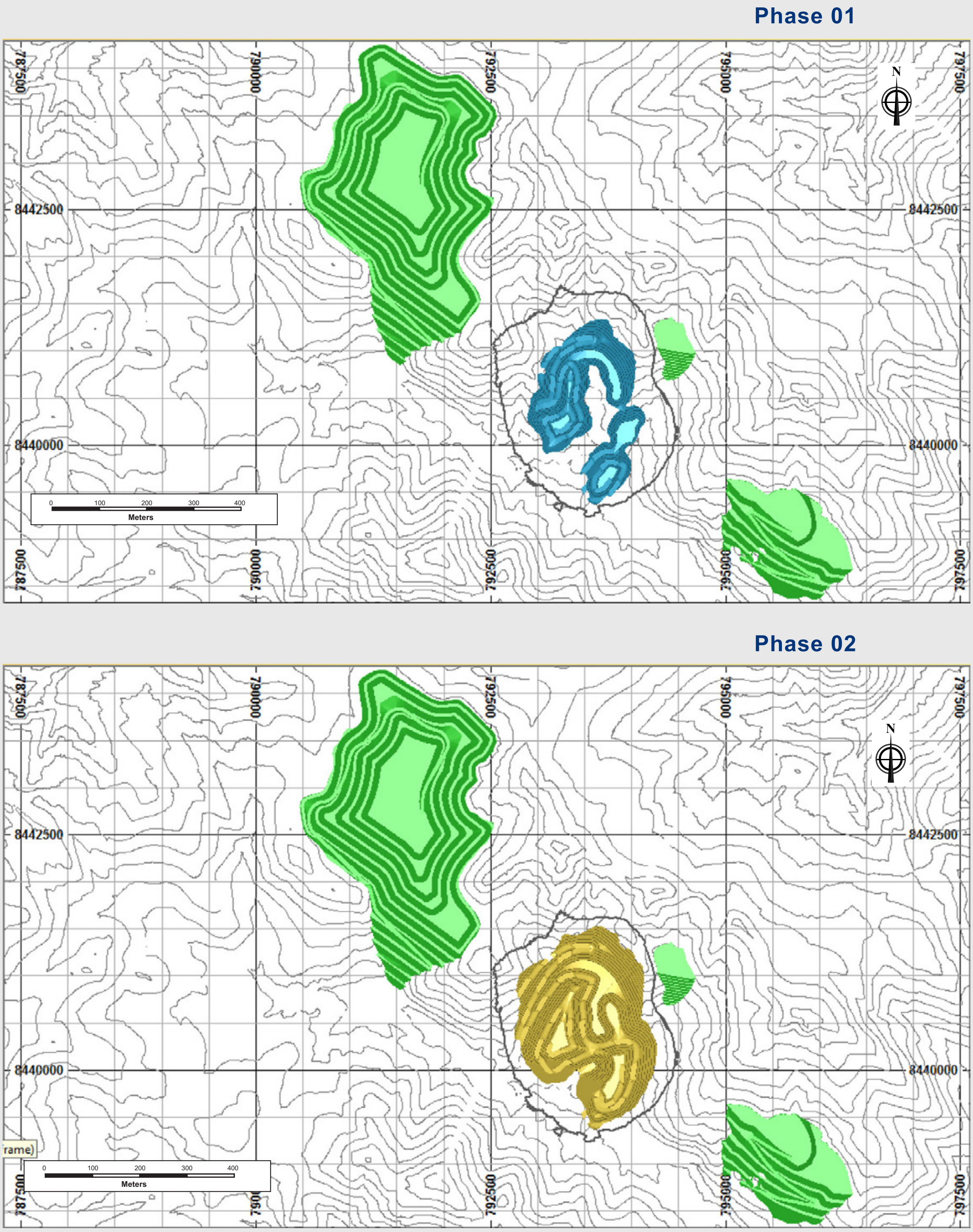
Table 9-9 Consolidated LOM Production Plan Summary

Year	Units	LOM	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Ore Mined	Mt	952.5	5.5	14.4	54	72.3	49.7	51	51	51	51	51	51	51	51	50.9	40.1	47.6	48.9	45.1	31.8	49.9	34.3
Cu	%	0.72	1.66	1.14	1.19	0.75	0.83	0.89	0.83	0.61	0.7	0.91	0.97	0.66	0.54	0.51	0.39	0.82	0.53	0.55	0.47	0.54	0.54
Mo	ppm	176	170	222	208	188	166	152	164	147	126	162	201	208	127	144	136	218	205	224	172	185	197
Ag	gpt	3.66	8.94	6.48	7.3	3.81	2.71	3.79	3.7	3.16	4.94	5.84	5.58	3	2.55	1.83	1.46	4.43	2.63	2.45	1.95	2.64	2.32
Au	gpt	0.06	0.18	0.13	0.14	0.07	0.04	0.06	0.06	0.06	0.03	0.07	0.11	0.05	0.03	0.02	0.02	0.1	0.05	0.05	0.04	0.05	0.04
Ore to Stock	Mt	123.1	5.5	0.4	3	34.3	7.4	6.6	6.9	15.9	9.6	2.8	1.5	1.6	6.1	4.8	7.1	0.9	5.4	2.2	1	-	-
Cu	%	0.39	1.66	0.31	0.29	0.44	0.37	0.3	0.31	0.28	0.27	0.26	0.26	0.25	0.26	0.27	0.26	0.24	0.24	0.24	0.24	-	-
Mo	ppm	107	170	90	77	112	149	99	104	93	103	123	51	78	130	115	85	78	78	73	65	-	-
Ag	gpt	1.57	8.94	1.32	1.17	1.6	1.44	1.05	1.15	1.09	1.16	1.13	0.91	0.95	1.09	0.95	0.91	1.03	0.76	0.76	0.91	-	-
Au	gpt	0.03	0.18	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.02	0.02	0.02	0.02	-	-
Waste to Dump	Mt	1,864.50	24.5	94.8	88.3	56.3	94.3	99	93	93	99	99	99	99	99	99.1	102.2	101.2	101.1	100.5	104.2	100.1	17.8
Total Rock Mined	Mt	2,817.00	30	109.2	142.3	128.6	144	150	144	144	150	150	150	150	150	150	142.4	148.8	150	145.6	136.1	150	52.1
Strip Ratio		1.96	4.45	6.58	1.63	0.78	1.89	1.94	1.82	1.83	1.94	1.94	1.94	1.94	1.94	1.95	2.55	2.13	2.07	2.23	3.27	2.01	0.52
Ore from Stockpile	Mt	123.1	-	-	-	13.1	8.7	6.6	6.9	15.9	9.6	2.8	1.5	1.6	6.1	5	14.1	4.4	7.5	5.9	13.1	0.4	-
Cu	%	0.39	-	-	-	1.02	0.46	0.38	0.37	0.34	0.31	0.3	0.3	0.3	0.29	0.29	0.28	0.27	0.27	0.26	0.24	0.23	-
Mo	ppm	107	-	-	-	166	142	93	90	92	123	98	78	66	66	68	104	135	144	77	78	143	-
Ag	gpt	1.57	-	-	-	5.07	1.47	1.45	1.31	1.33	1.03	1.05	1.04	1.04	1.04	1.03	1.05	0.85	1.31	1.04	0.93	1.53	-
Au	gpt	0.03	-	-	-	0.1	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.02	0.02	-
Total Rock Moved	Mt	2,940.10	30	109.2	142.3	141.6	152.7	156.6	150.9	159.9	159.6	152.8	151.5	151.6	156.1	155	156.5	153.2	157.5	151.6	149.2	150.4	52.1
Mining Rate	Mtpd	0.41	0.16	0.3	0.39	0.39	0.42	0.43	0.41	0.44	0.44	0.42	0.41	0.42	0.43	0.42	0.43	0.42	0.43	0.42	0.41	0.41	0.14
Total Ore toMill	Mt	952.5	-	14	51	51	51	51	51	51	51	51	51	51	51	51	47.1	51	51	48.9	44	50.2	34.3
Cu	%	0.72	-	1.16	1.24	1.02	0.83	0.9	0.84	0.63	0.71	0.91	0.97	0.67	0.55	0.51	0.38	0.78	0.53	0.53	0.41	0.53	0.54
Mo	ppm	176	-	226	215	234	164	151	162	146	130	161	201	208	119	139	134	214	210	213	146	184	197
Ag	gpt	3.66	-	6.63	7.66	5.62	2.69	3.84	3.72	3.24	4.91	5.84	5.59	3	2.55	1.83	1.42	4.19	2.64	2.35	1.67	2.63	2.32
Au	gpt	0.06	-	0.13	0.15	0.1	0.04	0.06	0.06	0.06	0.03	0.07	0.11	0.05	0.03	0.02	0.02	0.1	0.05	0.05	0.03	0.05	0.04
Stockpile Beginning	Mt	408.6	-	5.5	5.9	8.9	30.2	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	21.8	18.3	16.2	12.5	0.4	0
Stockpile Balance	Mt	408.6	5.5	5.9	8.9	30.2	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.8	21.8	18.3	16.2	12.5	0.4	0	0
Metal Recovery																							
Cu	%			87.77	88.41	88.02	86.95	86.28	85.79	83.87	89.17	88.94	88.62	87.89	81.76	80.68	82.42	89.15	87.61	87.07	85.97	86.73	87.11
Mo	%			63.06	64.04	64.88	63.44	56.93	58.2	58.59	55.03	59.14	64.69	71.98	56.79	57.11	60.71	69.19	68.1	69.22	70.84	68.74	72.37
Ag	%			64.58	64.81	64.68	68.43	67.19	65.72	63.97	65.74	65.91	64.74	64.64	60.44	56.07	59.31	64.61	62.75	63.64	63.63	64.1	64.09
Au	%			68.91	69.29	68.93	66.64	67.3	67.72	68.34	65.99	68.73	69.44	69.25	65.74	65.39	67.06	69.44	69.29	69.19	68.89	68.79	69
Concentrate																							
Cu Dry Quantity	kt	16,452.60		357.1	1,403.40	1,147.30	1,141.50	1,192.30	1,073.90	725.6	1,046.50	1,202.60	1,097.20	764.8	735.3	681.5	442.3	898.2	601	567.9	385.5	581.6	407.1
Cu	%	36.4		40.0	40.0	40.0	32.3	33.1	34.3	37.3	30.9	34.2	40.0	39.0	31.1	30.7	33.4	39.6	39.1	39.4	39.9	40.0	40.0
Contained Cu	t	5,987,710	0	142,794	561,197	458,795	369,070	394,696	368,817	270,896	323,742	411,608	438,748	298,285	228,575	209,174	147,944	355,743	234,718	224,035	153,626	232,453	162,792
Mo Dry Quantity	t	215,171		3,984	14,062	15,461	10,637	8,784	9,602	8,750	7,306	9,693	13,293	15,243	6,918	8,103	7,678	15,080	14,567	14,383	9,124	12,726	9,778
Mo	%	50		50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Contained Mo	t	107,585		1,992	7,031	7,730	5,318	4,392	4,801	4,375	3,653	4,846	6,646	7,621	3,459	4,051	3,839	7,540	7,283	7,191	4,562	6,363	4,889



OPEN PIT METALS xpac SOLUTIONS

RungePincockMinarco

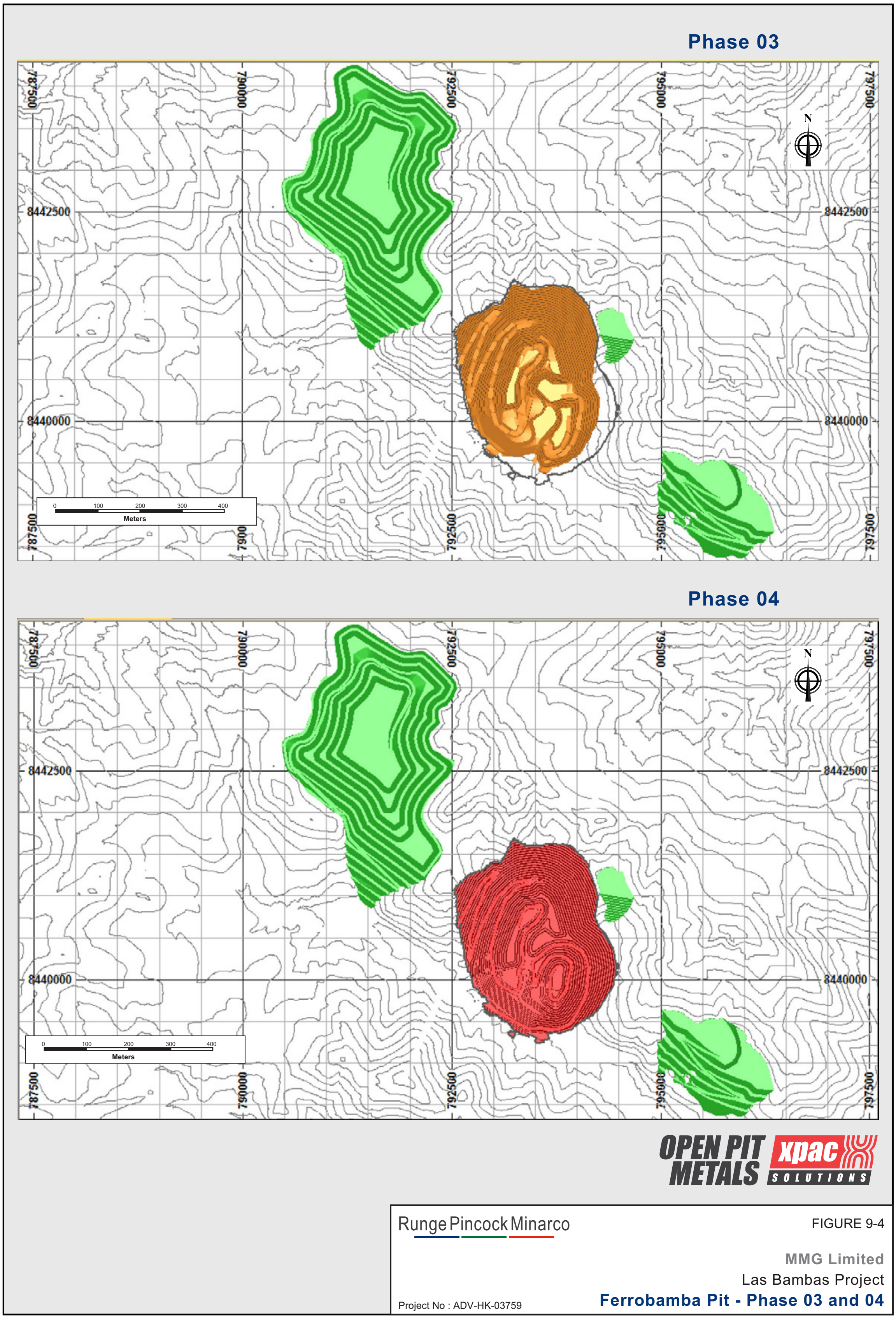
FIGURE 9-3

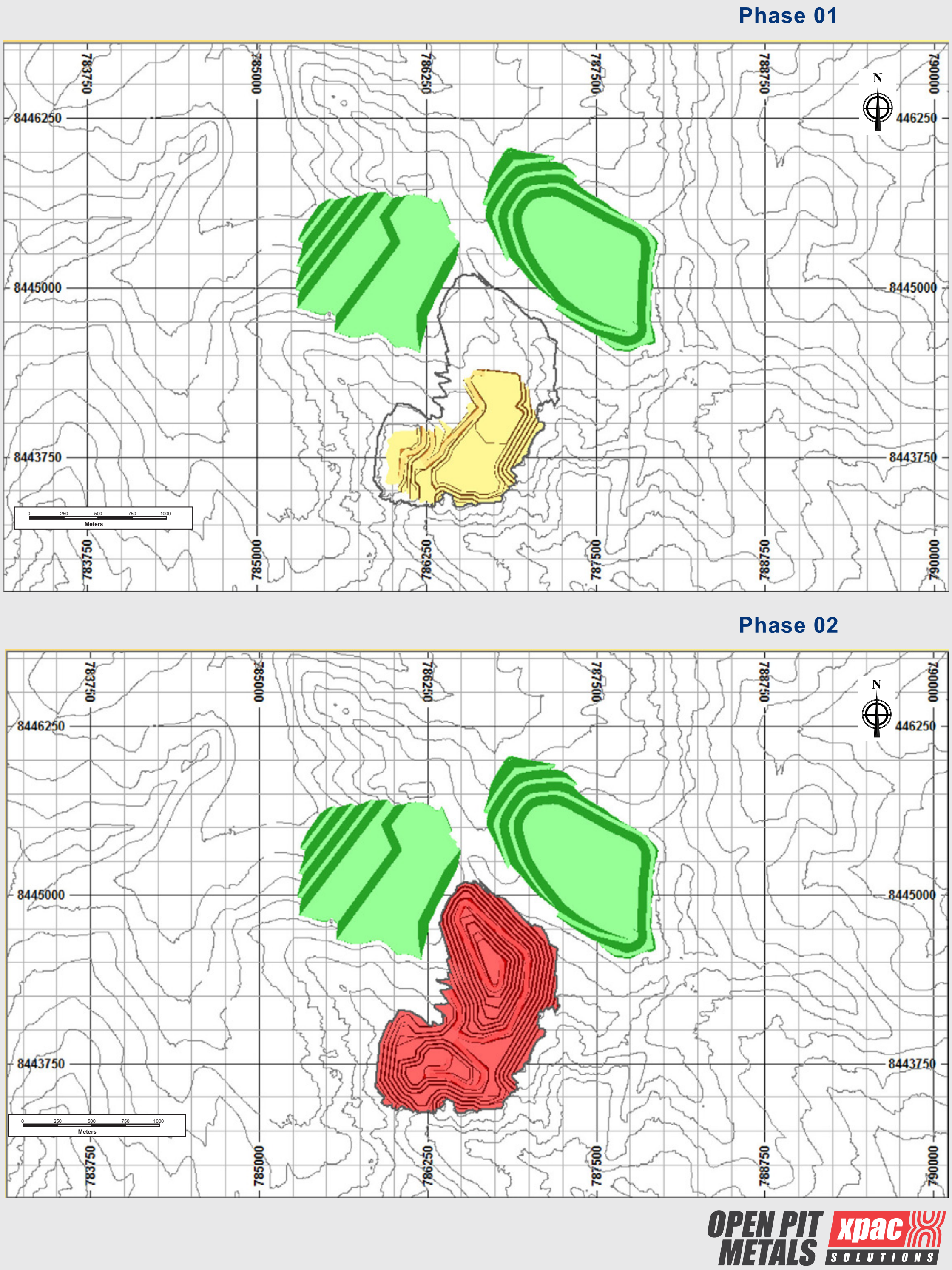
MMG Limited

Las Bambas Project

Ferrobamba Pit - Phase 01 and 02

Project No : ADV-HK-03759


Phase 03
787500
790000
792500
795000
797500
8442500
8440000
N
0 100 200 300 400
Meters
Phase 04
787500
790000
792500
795000
797500
8442500
8440000
N
0 100 200 300 400
Meters
OPEN PIT METALS
xpac SOLUTIONS
RungePincockMinarco
FIGURE 9-4
MMG Limited
Las Bambas Project
Ferrobamba Pit - Phase 03 and 04
Project No : ADV-HK-03759



RungePincockMinarco

FIGURE 9-5

MMG Limited

Las Bambas Project

Chalcobamba Pit - Phase 01 and 02

Project No : ADV-HK-03759

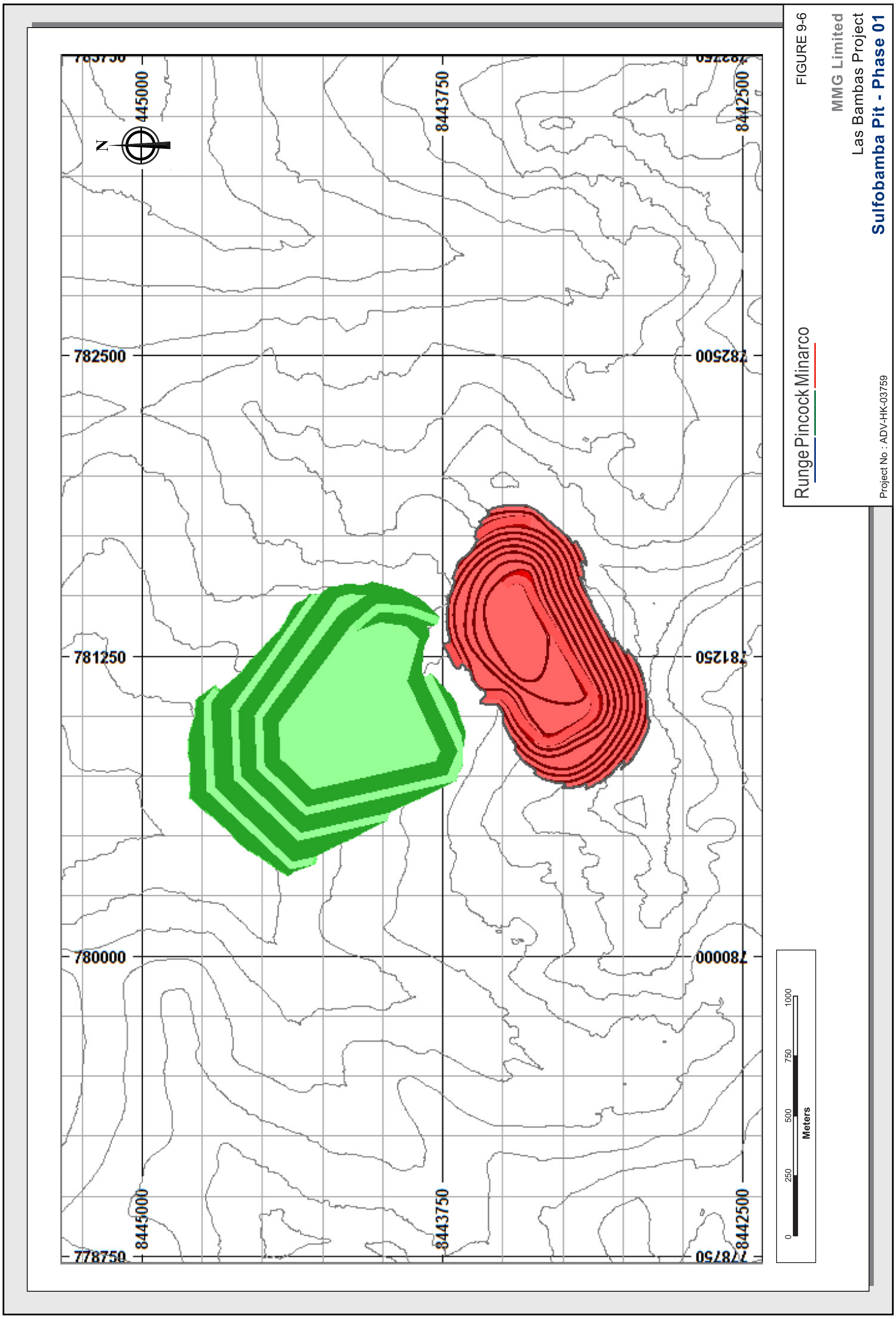


FIGURE 9-6
MMG Limited
Las Bambas Project
Sulfobamba Pit - Phase 01
Runge Pincock Minarco
Project No : ADV-HK-03759
8445000
8443750
8442500
782500
781250
780000
778750
0
250
500
750
1000
Meters

RungePincockMinarco

Figure 9-7 LOM Production with Cu and Mo Grade

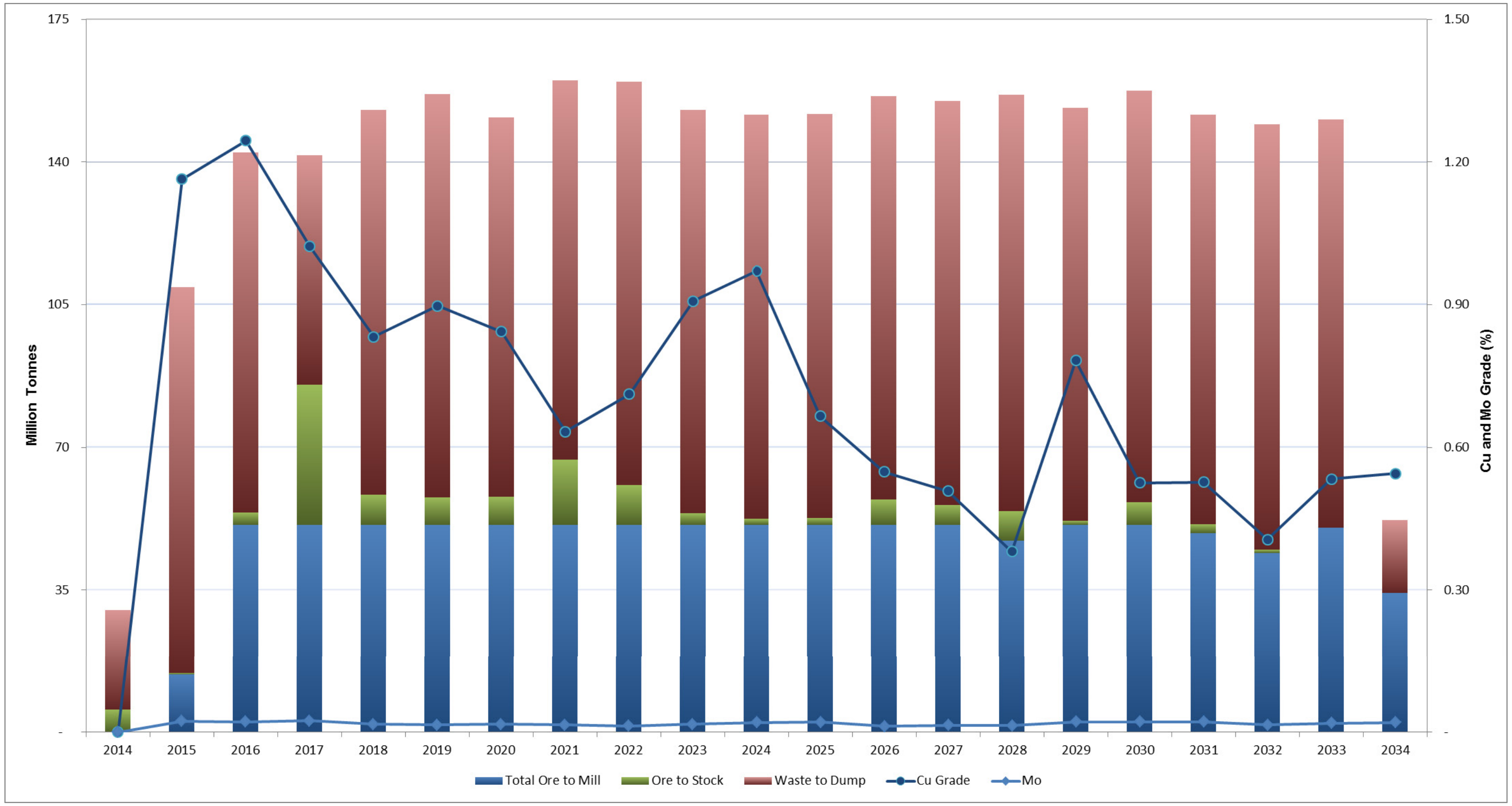


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Table 9-10 Ferrobamba Production Plan

Year	Units	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Ore Mined																							
Phase 01																							
Ore Mined (direct plus rehandle)	tonnes	157,583,539	5,509,614	14,400,000	54,000,000	72,250,000	10,193,231	41,853		1,188,840													
Cu	%	0.97	1.66	1.14	1.19	0.75	0.68	0.23		1.48													
Mo	ppm	203	170	222	208	188	279	5		198													
Ag	gpt	5.36	8.94	6.48	7.30	3.81	1.99	1.44		9.45													
Au	gpt	0.10	0.18	0.13	0.14	0.07	0.03	0.02		0.18													
Phase 02																							
Ore Mined (direct plus rehandle)	tonnes	218,549,735					2,776,579	19,145,862	26,968,175	38,972,054	12,437,326	18,158,369	51,000,000	49,028,671	62,700								
Cu	%	0.77					0.99	0.84	0.77	0.59	0.36	1.17	0.97	0.64	0.37								
Mo	ppm	179					155	221	175	135	79	166	201	211	98								
Ag	gpt	4.10					5.07	4.61	4.21	3.02	1.20	6.89	5.58	2.79	0.96								
Au	gpt	0.08					0.11	0.09	0.08	0.06	0.02	0.15	0.11	0.05	0.03								
Phase 03																							
Ore Mined (direct plus rehandle)	tonnes	180,079,141										1,795,320			4,211,220	2,137,260	15,402,149	47,557,780	48,933,931	45,103,760	14,937,720		
Cu	%	0.60										0.54			0.56	0.54	0.37	0.82	0.53	0.55	0.51		
Mo	ppm	209										228			235	191	144	218	205	224	211		
Ag	gpt	2.95										3.13			3.01	2.60	1.56	4.43	2.63	2.45	2.17		
Au	gpt	0.06										0.06			0.06	0.05	0.03	0.10	0.05	0.05	0.05		
Phase 04																							
Ore Mined (direct plus rehandle)	tonnes	101,084,880																		15,780	16,903,200	49,858,959	34,306,941
Cu	%	0.52																		0.31	0.43	0.54	0.54
Mo	ppm	181																		107	138	185	197
Ag	gpt	2.38																		1.26	1.75	2.64	2.32
Au	gpt	0.04																		0.01	0.03	0.05	0.04
Ferrobamba Pit																							
Ore Mined (direct plus rehandle)	tonnes	657,297,295	5,509,614	14,400,000	54,000,000	72,250,000	12,969,810	19,187,715	26,968,175	40,160,894	12,437,326	19,953,689	51,000,000	49,028,671	4,273,920	2,137,260	15,402,149	47,557,780	48,933,931	45,119,540	31,840,920	49,858,959	34,306,941
Cu	%	0.73	1.66	1.14	1.19	0.75	0.74	0.84	0.77	0.62	0.36	1.11	0.97	0.64	0.55	0.54	0.37	0.82	0.53	0.55	0.47	0.54	0.54
Mo	ppm	194	170	222	208	188	252	220	175	137	79	171	201	211	233	191	144	218	205	224	172	185	197
Ag	gpt	3.82	8.94	6.48	7.30	3.81	2.65	4.60	4.21	3.21	1.20	6.55	5.58	2.79	2.98	2.60	1.56	4.43	2.63	2.45	1.95	2.64	2.32
Au	gpt	0.08	0.18	0.13	0.14	0.07	0.05	0.09	0.08	0.07	0.02	0.15	0.11	0.05	0.06	0.05	0.03	0.10	0.05	0.05	0.04	0.05	0.04
Ore to Stock																							
Ore to Stock	tonnes	90,631,746	5,509,614	420,000	3,000,000	34,300,653	2,248,727	4,023,855	4,672,355	13,454,854	5,464,415	1,001,820	1,490,880	1,426,620	311,760	334,620	3,455,994	939,000	5,434,230	2,178,750	963,600		
Cu	%	0.42	1.66	0.31	0.29	0.44	0.34	0.30	0.31	0.28	0.27	0.27	0.26	0.26	0.25	0.26	0.25	0.24	0.24	0.24	0.24		
Mo	ppm	95.18	169.98	90.27	76.55	111.57	112.40	104.04	75.37	67.08	58.91	115.65	51.25	75.37	125.13	139.47	70.24	78.03	78.01	73.19	65.09		
Ag	gpt	1.71	8.94	1.32	1.17	1.60	1.35	1.02	1.22	1.11	0.82	0.72	0.91	0.86	1.13	0.76	0.88	1.03	0.76	0.76	0.91		
Au	gpt	0.03	0.18	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02		
Waste to Dump	tonnes	1,425,715,722	24,490,386	94,800,000	88,274,437	56,310,571	43,063,346	76,896,439	80,579,461	74,459,078	17,997,671	55,583,965	57,300,627	91,164,658	16,671,746	35,612,410	90,902,914	98,312,031	100,646,427	100,500,000	104,250,000	100,141,041	17,758,514
Total Rock Mined	tonnes	2,083,013,016	30,000,000	109,200,000	142,274,437	128,560,571	56,033,156	96,084,154	107,547,635	114,619,972	30,434,998	75,537,654	108,300,627	140,193,329	20,945,666	37,749,670	106,305,063	145,869,811	149,580,358	145,619,540	136,090,920	150,000,000	52,065,455
Strip Ratio		2.17	4.45	6.58	1.63	0.78	3.32	4.01	2.99	1.85	1.45	2.79	1.12	1.86	3.90	16.66	5.90	2.07	2.06	2.23	3.27	2.01	0.52
Ore from Stock																							
Ore from Stock	tonnes	90,631,746				13,050,653	6,566,646	6,617,048	6,895,490	12,864,656	5,133,542	2,751,206	1,490,880	1,646,700	6,123,036	4,978,503	9,109,562			966,420	12,253,340	184,063	
Cu	%	0.42				1.02	0.46	0.38	0.37	0.35	0.30	0.30	0.30	0.30	0.29	0.29	0.29			0.27	0.24	0.23	
Mo	ppm	95.18				165.81	107.70	93.42	90.19	81.50	97.95	98.27	77.82	65.77	66.38	67.81	81.20			15.14	77.21	135.90	
Ag	gpt	1.71				5.07	1.50	1.45	1.31	1.26	1.13	1.05	1.04	1.04	1.04	1.03	0.97			1.22	0.85	1.33	
Au	gpt	0.03				0.10	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			0.01	0.02	0.03	
Total Rock Moved	tonnes	2,173,644,762	30,000,000	109,200,000	142,274,437	141,611,224	62,599,802	102,701,202	114,443,126	127,484,628	35,568,540	78,288,859	109,791,507	141,840,029	27,068,702	42,728,173	115,414,625	145,869,811	149,580,358	146,585,960	148,344,260	150,184,063	52,065,455
Mining Rate	tpd	334,691	163,043	298,361	389,793	387,976	171,506	280,604	313,543	349,273	97,448	213,904	300,799	388,603	74,161	116,744	316,204	399,643	409,809	400,508	406,423	411,463	142,645
Ferrobamba Ore to Mill																							
Ore to Mill	tonnes	657,297,295		13,980,000	51,000,000	51,000,000	17,287,729	21,780,908	29,191,311	39,570,697	12,106,453	21,703,074	51,000,000	49,248,751	10,085,196	6,781,143	21,055,718	46,618,780	43,499,701	43,907,210	43,130,660	50,043,022	34,306,941
Cu	%	0.73		1.16	1.24	1.02	0.69	0.80	0.75	0.64	0.38	1.05	0.97	0.64	0.41	0.37	0.36	0.83	0.57	0.56	0.41	0.53	0.54
Mo	ppm	194		226	215	234	216	203	171	143	96	165	201	210	135	103	129	221	221	226	147	184	197
Ag	gpt	3.82		6.63	7.66	5.62	2.38	4.31	4.00	3.29	1.34	6.13	5.59	2.79	1.86	1.54	1.42	4.50	2.87	2.51	1.66	2.64	2.32
Au	gpt	0.08		0.13	0.15	0.10	0.04	0.09	0.08	0.07	0.03	0.14	0.11	0.05	0.04	0.03	0.03	0.10	0.05	0.05	0.03	0.05	0.04

Notes:
1) Tonnage in metric tonnes
2) Glencore Xstrata pit design with Cutoff Grade of 0.2% Cu applied to all oretypes
3) Figures reported are rounded which may result in small tabulation errors.

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Table 9-11 Chalcobamba Production Plan

Year	Units	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Ore Mined																							
Phase 01																							
Ore Mined (direct plus rehandle)	tonnes	105,891,271					36,780,190	31,812,285	24,031,825	10,074,610		3,192,360											
Cu	%	0.85					0.86	0.92	0.91	0.60		0.48											
Mo	ppm	145					135	111	151	191		406											
Ag	gpt	2.94					2.74	3.30	3.12	2.57		1.34											
Au	gpt	0.04					0.04	0.04	0.04	0.03		0.02											
Phase 02																							
Ore Mined (direct plus rehandle)	tonnes	129,096,521									3,765,252	10,243,820			41,694,930	48,676,361	24,716,157						
Cu	%	0.51									0.65	0.59			0.53	0.51	0.41						
Mo	ppm	128									88	109			118	142	131						
Ag	gpt	2.03									3.35	3.14			2.28	1.79	1.39						
Au	gpt	0.03									0.04	0.04			0.03	0.02	0.02						
Chalcobamba Pit																							
Ore Mined (direct plus rehandle)	tonnes	234,987,792					36,780,190	31,812,285	24,031,825	10,074,610	3,765,252	13,436,180	-	-	41,694,930	48,676,361	24,716,157	-	-				
Cu	%	0.66					0.86	0.92	0.91	0.60	0.65	0.56	-	-	0.53	0.51	0.41	-	-				
Mo	ppm	136					135	111	151	191	88	180	-	-	118	142	131	-	-				
Ag	gpt	2.44					2.74	3.30	3.12	2.57	3.35	2.71	-	-	2.28	1.79	1.39	-	-				
Au	gpt	0.03					0.04	0.04	0.04	0.03	0.04	0.04	-	-	0.03	0.02	0.02	-	-				
Ore to Stock																							
Ore to Stock	tonnes	27,195,581					5,157,539	2,593,193	2,223,136	2,412,326	810,840	797,640			5,073,302	4,457,504	3,670,101						
Cu	%	0.29					0.37	0.30	0.30	0.29	0.26	0.26			0.26	0.27	0.26						
Mo	ppm	135.30					164.66	89.92	164.49	235.71	84.21	126.19			123.41	113.79	98.23						
Ag	gpt	1.09					1.47	1.10	0.99	0.97	1.20	1.07			1.03	0.96	0.94						
Au	gpt	0.01					0.02	0.01	0.01	0.01	0.02	0.02			0.01	0.01	0.01						
Waste to Dump	tonnes	311,431,911					51,186,654	22,103,561	12,420,539	6,768,898	7,110,100	15,322,237	35,721,038	5,251,422	77,322,874	63,526,809	11,340,169	2,937,969	419,642				
Total Rock Mined	tonnes	546,419,703	-	-	-	-	87,966,844	53,915,846	36,452,365	16,843,508	10,875,353	28,758,417	35,721,038	5,251,422	119,017,805	112,203,170	36,056,326	2,937,969	419,642	-	-	-	-
Strip Ratio		1.33	-	-	-	-	1.39	0.69	0.52	0.67	1.89	1.14	-	-	1.85	1.31	0.46	-	-	-	-	-	-
Ore from Stock																							
Ore from Stock	tonnes	27,195,581					2,089,620			3,047,976	4,302,362						5,011,466	4,381,220	2,587,247	4,967,790	731,760	76,140	
Cu	%	0.29					0.44			0.32	0.32						0.27	0.27	0.27	0.26	0.25	0.23	
Mo	ppm	135.30					248.86			134.49	156.10						145.86	134.57	90.01	89.22	105.31	56.00	
Ag	gpt	1.09					1.37			1.64	0.87						1.18	0.85	0.91	1.01	1.35	1.63	
Au	gpt	0.01					0.02			0.02	0.01						0.02	0.01	0.01	0.01	0.02	0.01	
Total Rock Moved	tonnes	573,615,285	-	-	-	-	90,056,464	53,915,846	36,452,365	19,891,484	15,177,715	28,758,417	35,721,038	5,251,422	119,017,805	112,203,170	41,067,792	7,319,189	3,006,889	4,967,790	731,760	76,140	-
Mining Rate	tpd	208,182	-	-	-	-	246,730	147,311	99,869	54,497	41,583	78,575	97,866	14,387	326,076	306,566	112,514	20,053	8,238	13,573	2,005	209	-
Chalcobamba Ore to Mill																							
Ore to Mill	tonnes	234,987,792					33,712,271	29,219,092	21,808,689	10,710,261	7,256,774	12,638,540			36,621,628	44,218,857	26,057,522	4,381,220	2,587,247	4,967,790	731,760	76,140	
Cu	%	0.66					0.91	0.97	0.97	0.59	0.50	0.58			0.57	0.53	0.40	0.27	0.27	0.26	0.25	0.23	
Mo	ppm	136					138	113	150	164	129	183			117	145	139	135	90	89	105	56	
Ag	gpt	2.44					2.84	3.50	3.34	2.66	2.12	2.81			2.46	1.88	1.41	0.85	0.91	1.01	1.35	1.63	
Au	gpt	0.03					0.04	0.04	0.04	0.03	0.03	0.04			0.03	0.02	0.02	0.01	0.01	0.01	0.02	0.01	

Notes:
1) Tonnage in metric tonnes
2) Glencore Xstrata pit design with Cutoff Grade of 0.2% Cu applied to all oretypes
3) Figures reported are rounded which may result in small tabulation errors.

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Table 9-12 Sulfobamba Production Plan

Year	Units	Total	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Ore Mined																							
Sulfobamba Pit																							
Ore Mined (direct plus rehandle)	tonnes	60,183,177								725,986	34,797,421	17,610,132		1,971,329	5,031,149	47,160							
Cu	%	0.86								0.74	0.83	0.93		1.30	0.62	0.27							
Mo	ppm	140								65	147	138		137	112	78							
Ag	gpt	6.65								8.40	6.45	7.43		8.22	4.44	1.87							
Au	gpt	0.02								0.01	0.03	0.02		0.03	0.01	0.01							
Ore to Stock																							
Ore to Stock	tonnes	5,320,135								6,943	3,356,232	951,746		220,080	737,974	47,160							
Cu	%	0.27								0.26	0.27	0.25		0.23	0.29	0.27							
Mo	ppm	165.44								113.13	179.35	127.33		95.43	178.30	77.67							
Ag	gpt	1.65								1.61	1.70	1.60		1.54	1.50	1.87							
Au	gpt	0.01								0.01	0.01	0.01		0.01	0.01	0.01							
Waste to Dump	tonnes	127,364,196								11,810,534	73,892,228	28,093,798	5,978,335	2,583,920	5,005,380								
Total Rock Mined	tonnes	187,547,373	-	-	-	-	-	-	-	12,536,520	108,689,650	45,703,930	5,978,335	4,555,249	10,036,529	47,160	-	-	-	-	-	-	-
Strip Ratio		2.12	-	-	-	-	-	-	-	16.27	2.12	1.60	-	1.31	0.99	-	-	-	-	-	-	-	-
Ore from Stock																							
Ore from Stock	tonnes	5,320,135									195,583								4,913,052		103,500	108,000	
Cu	%	0.27									0.31								0.27		0.24	0.23	
Mo	ppm	165.44									60.60								171.84		7.40	215.83	
Ag	gpt	1.65									1.86								1.52		7.36	1.79	
Au	gpt	0.01									0.01								0.01		0.01	0.01	
Total Rock Moved	tonnes	192,867,508	-	-	-	-	-	-	-	12,536,520	108,885,233	45,703,930	5,978,335	4,555,249	10,036,529	47,160	-	-	4,913,052	-	103,500	108,000	-
Mining Rate	tpd	202,818	-	-	-	-	-	-	-	34,347	298,316	124,874	16,379	12,480	27,497	129	-	-	13,460	-	284	296	-
Sulfobamba Ore to Mill																							
Ore to Mill	tonnes	60,183,177								719,043	31,636,772	16,658,386		1,751,249	4,293,175				4,913,052		103,500	108,000	
Cu	%	0.86								0.74	0.89	0.97		1.44	0.67				0.27		0.24	0.23	
Mo	ppm	140								64	143	138		142	101				172		7	216	
Ag	gpt	6.65								8.47	6.92	7.76		9.06	4.94				1.52		7.36	1.79	
Au	gpt	0.02								0.01	0.03	0.02		0.04	0.01				0.01		0.01	0.01	

Notes:
1) Tonnage in metric tonnes
2) Glencore Xstrata pit design with Cutoff Grade of 0.2% Cu applied to all oretypes
3) Figures reported are rounded which may result in small tabulation errors.

This production schedule is based on mining multiple pits simultaneously and may be improved with further optimization evaluation. In compiling this production schedule, RPM took into account the timing of expected infrastructure constructions.

In order to achieve a practical production plan, RPM limited the total rock movement to 160 Mtpa and the upper limit of stockpile material to 65 million tonnes. Those constraints combined with the requirement of 51 ROM Mtpa year sent to the mill plus an efficient stockpile management allowed RPM to deliver an optimized mine plan. RPM also improved the area haulage network in order to present realistic rock movement in the LOM plan, which amounted to 5% higher haulage costs (Opex and Capex) than planned by the Company. Figure 9-7 shows the total material movement (million tonnes).

The material movement constraints imposed by RPM in the optimized mine plan resulted in a stockpile of lower grade ore that was less than half the stockpile tonnage suggested by the Company. Similar to the Company plan, RPM's optimal plan for total tonnes moved falls very close to 160 Mt.

9.6 Mine Construction works

As part of the development of the Project the Company is completing or plans to complete significant infrastructure construction. A detailed description of the infrastructure requirements are provided in ***Section 11***, however notes the specific mine related information below.

9.6.1 Review of Activities, Construction Work / Earthworks Completed To Date

Currently crews work 12 hours per day, seven days per week. There is not currently a night shift, so this is accomplished with two 32-person crews. Fifty percent of these crews are local residents, and for most it is their first exposure to safety training and to operating mining equipment. All employees are required to stay in the camp immediately prior to and throughout their rotation, regardless of the location of their home.

Training is done via class-room, equipment simulation, and hands-on in-field training. The mine staff has prepared Standard operating procedures' and task training and has provided trainers from throughout Peru.

The mine department is currently in the process of staffing up, making final operational plans, training personnel, assembling equipment and constructing a pioneer road that will be used to haul pre-stripping material to appropriate locations.

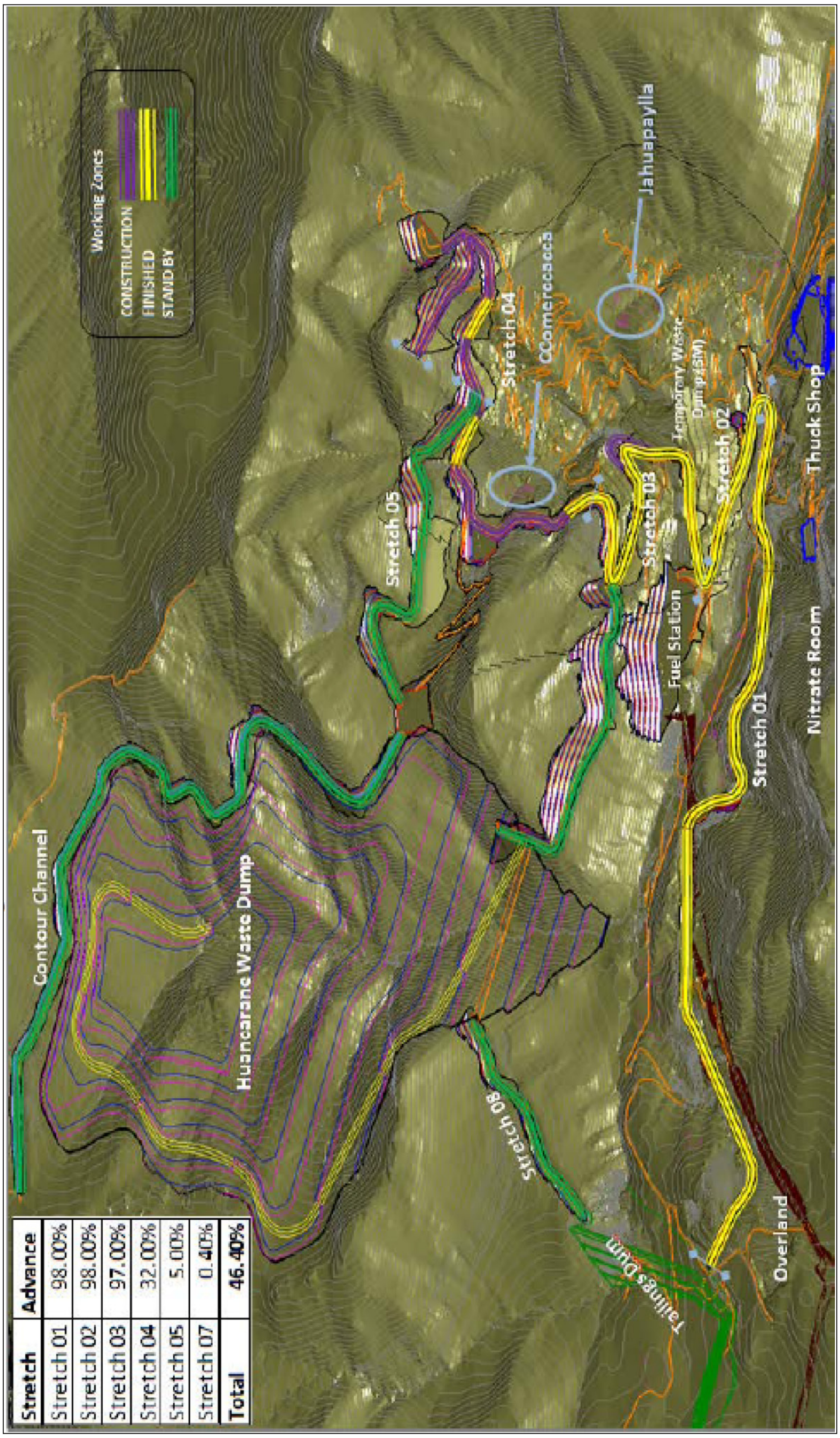
9.6.2 Pioneer Road

As part of the Project development the Company is constructing a road which will connect mine pre-stripping locations with both the tailings dam face, where waste from the mine will be used for construction purposes, and to the Ferrobamba waste dump. This road is critical to ensure the production ramp up and construction of the tails dam facility. The Company is constructing the pioneer road in segments and progress on each segment is shown in ***Table 9-13***. A contractor is constructing the Segment 1, to the tailings dam, while the Company is constructing the remainder. This road is planned to be completed in late 2014 and is graphically shown in ***Figure 9-8***.

Table 9-13 Pioneering Road Progress as at 28th February 2014

Segment	Progress
1	98.0%
2	98.0%
3	97.0%
4	32.0%
5	5.0%
7	40.0%
Overall	61.7%

Source: Provided by the Company.



Stretch	Advance
Stretch 01	98.00%
Stretch 02	98.00%
Stretch 03	97.00%
Stretch 04	32.00%
Stretch 05	5.00%
Stretch 07	0.40%
Total	46.40%

FIGURE 9-8

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MMG Limited

Las Bambas Project

Pioneering Road Progress through February 2014

Project No : ADV-HK-03759

9.7 Comments and Recommendations

RPM considers that an open cut mining method is best suited for the project and is the most effective means by which to exploit the mineralisation of the project. RPM's review of mine plans identified some potential opportunities associated with the mine plan and production schedule, mainly regarding additional mining studies developed by the Company in order to review the current resource base focusing on the expansion of the processing capacities, specifically regarding tailings limitations. These studies included the conversion of large tonnages of "inferred material", which in RPM's view has a high probability of converting to "Ore Reserves".

RPM considers that these studies highlight a number of opportunities within the current production plan, not only to increase revenue and reserve base but also decrease the risk of ore availability in the shorter term production plans.

RPM is aware that at least two other deposits have been identified that are regarded as high priority targets Initial exploration has produced positive results and additional drilling and exploration works is required to define resources

Finally, the Ferrobamba pit contains an approximately 125 million tonnes of "inferred material", which in RPM's view has a high probability of converting to "Ore Reserves" once better defined. It is also possible these additional "inferred resources" will allow management of Project to either: 1) mine the additional 125 million tonnes from the Ferrobamba pit to the currently designed tailings dam, which implies to mine less tonnes from either the Chalcobamba or the Sulfobamba pits, or 2) optimize the district cut-off grade by increasing it to a level that fills the currently designed tailings dam with material of a higher cut-off grade than currently anticipated. This could further optimize the project's NPV. Should more tailings space become available, additional options exist to extend the mine life,

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10 Metallurgy and Ore Processing

10.1 Summary

Ore is planned to be processed in a conventional Cu-Mo froth flotation plant which will be feed from the pits via primary crushers and overland conveyors. Milling of the crushed ore will be carried out using SAG and ball mills prior to a bulk Cu-Mo flotation and Mo separation flotation from the bulk concentrate. Separate Cu and Mo concentrate thickening, filtration, and loadout systems will be used and a tailings thickening facility employed prior to impoundment of "thickened" tailings in a slurry dam adjoining the plant.

Metallurgical testwork indicates that the ore responds well to standard processing methods, and RPM considers there to be no material difficulties in the proposed methods, however RPM notes the ore has a high abrasivity index (0.3 in the case of Ferrobamba) as a consequence of a high garnet content in the skarn component (which constitutes about 50% of the ore). This aspect is well known, and the plant design has taken this into consideration. Additionally, the magnetite-skarn fraction of the Chalcobamba deposit will only ever be a small proportion of mill feed (through blending) due to its very high magnetite content. This has been incorporated in Project planning.

The planned mill throughput rate is 140 ktpd or 51.1 Mtpa. The plant will generate an average of approximately 0.8 Mtpa of Cu concentrate and 11.0 ktpa of Mo concentrate. The ore contains a significant amount of gold and silver (an annual average of 3.6 Moz silver and 59 koz gold) which will add substantial value to the Cu concentrate.

RPM considers the metallurgical testwork adequate and the plant design appropriate. As is common in copper-molybdenum projects, the parameters for molybdenum extraction are difficult to determine and RPM considers the projected molybdenum concentrate grade value of 50% to be optimistic based on the test work completed, but achievable when compared to similar projects globally. RPM notes that the molybdenum revenue accounts for less than 10% of the project over the life of mine and hence production of a lower-grade molybdenum concentrate would not have a material impact on the economics of the project.

10.2 Metallurgical Testwork

Extensive metallurgical testwork has been conducted on the Project's ore type though the work has focused primarily on the Ferrobamba deposit, the deposit which will be processed initially and will make up the bulk of the ore in the first 5 years of operation. The testwork has included the following areas of investigation:

- Mineralogy,
- Comminution, and
- Flotation.

In addition, limited thickening testwork has been conducted but the parameters for sedimentation and filtration used for the plant design are based on industry standard practices.

RPM considers the metallurgical testwork is at a feasibility study level and reasonable and sufficient to establish the metallurgical parameters and production rates over the LOM to be included in a Ore Reserves and underpin the required flowsheet design. RPM further notes that the details designs of the plant are at a feasibility study level.

10.2.1 Mineralogy

The Ferrobamba ore that will be processed consists of the following three ore types:

- Skarn Sulfide,
- Skarn Oxide, and
- Porphyry.

The two skarn ore types make up about half the currently defined Mineral Resource with the porphyry the other half. Each of the ore types has a range of oxidation states which are classified as follows: low, medium, and high. A table showing the mineralogical makeup of the Ferrobamba ore types is shown in ***Table 10-1***.

Visual inspection of the drill core shows occurrences of minor oxide minerals penetrating up to 200 m deep in the deposit. RPM notes that the majority of the oxide material is associate with the level of water table up to 30m in depth, the oxide material below this is isolated mineral occurrences along structures and does not have a material impact on the economic minerals or recovery rates. Total planned mining depth is approximately 500 m; accordingly, lower recoveries are likely to occur in the initial years when processing oxidised dominant ore. The core also shows the skarn ore to have a high proportion of garnet, a fact which is also seen in ***Table 10-1***. Garnet is hard and abrasive; the hardness is not evident in the work index results but the abrasiveness is evident in the high abrasion index of the ore.

Table 10-1 Testwork – Mineralogical Makeup of Ferrobamba Samples Tested

Ore Type	**Skarn Sulfide**		**Skarn Oxide**		**Porphyry**	
Oxidation State	**Low**	**Medium**	**Medium**	**High**	**Low**	**High**
Bornite	1.9	1.8	1.8	0.1	0.2	0.5
Chalcocite	0.3	0.2	2.1	0.1	0.0	0.3
Chalcopyrite	0.3	0.8	0.0	0.1	0.8	0.1
Chrysocolla	0.0	0.1	0.4	0.8	0.0	0.4
Copper Mixes	0.5	1.3	1.8	5.8	0.1	1.1
Copper Silicates	0.0	0.1	0.1	0.6	0.0	0.2
Molybdenite	0.01	0.06	0.02	0.02	0.08	0
Iron Titanium Oxides	2.9	1.6	0.6	1.5	0.8	0.6
Other Oxides	0.0	0.1	0.1	0.0	0.0	0.0
Sulfates & Phosphates	0.5	0.4	0.2	0.2	0.4	0.4
Carbonates	7.5	5.8	10.4	3.6	0.7	0.1
Amphiboles	3.5	4.0	3.2	2.4	3.3	3.7
Feldspars	4.4	6.0	2.6	6.7	70.3	70.6
Garnets	53.7	52.1	54.5	56.8	0.1	0.0
Other Silicates	0.9	0.3	0.4	0.3	1.0	0.9
Phyllosilicates	2.8	2.3	2.1	1.8	2.5	4.5
Pyroxines	16.3	16.8	15.6	11.9	0.1	0.2
Quartz Group	4.6	6.4	4.0	7.3	19.7	16.5
Total	**100.1**	**100.2**	**99.9**	**100.0**	**100.1**	**100.1**

RPM Conclusions:
1. *Copper mineral in skarn mainly bornite*
2. *Copper mineral in porphyry mainly chalcopyrite*
3. *Main gangue mineral in skarn is garnet*
4. *Main gangue mineral in porphyry is feldspar*
5. *Skarn ore has high carbonate content*
6. *All ore has negligible pyrite content*

Source: Provided by the Company.

The Chalcobamba ore that will be processed is somewhat different to the Ferrobamba ore; it consists of the following four ore types:

- Skarn Magnetite
- Skarn Sulfide
- Porphyry
- Breccia

Approximately 60% of the Chalcobamba ore is skarn sulfide; the remainder is split about equally among the other ore types. The Chalcobamba ore types have not been subdivided into oxidation states; however, the ore appears less oxidized than that of the Ferrobamba ore, with the exception of the breccia ore which has significant oxide mineralisation. A mineralogical analysis of the Chalcobamba ore similar to that of the Ferrobamba ore has not been generated. Visual inspection of the drill core shows a very high content of magnetite in the magnetite skarn, ore which occurs on the upper surface of the deposit; excessive amount of this ore in the mill feed is likely to be problematical since magnetite will overload the plant tramp-metal magnets.

Mineralogical examination of Sulfobamba ore indicates that it is similar to that of the Chalcobamaba ore.

10.2.2 Comminution

The following comminution testwork has been undertaken:

- Point-load tests,
- Semi-Autogenous Mill Power Index (SPI) tests,
- Semi-Autogenous Mill Comminution (SMC) tests,
- Bond Ball Mill Work Index tests (shown in Table 10-2), and
- Bond Rod Mill Work Index tests.

Table 10-2 Ball Mill Work Indicies (kWh/tonne)

No.	Ferrobamba	Chalcobamba
1	8.5	13.7
2	12.7	14.2
3	6.7	13.5
4	11.8	11.9
5	9	12.1
6	14.2	12.4
7	12.4	12
8	15	11.4
9	16.5	9.4
10	11.2	10.4
11	10.9	11.4
12	11.3	13
13	13.7	10.9
14		8
15		14.2
16		12.5
17		13.3
18		13.2
19		12.7
20		13.1
21		13.4
22		13.7
Average	**11.8**	**12.3**

RPM Conclusions:
1. Ball mill work index of Ferrobamaba and Chalcobamba ore about the same
2. Ball mill work index of ore is about 12 kWh/tonne
3. Mill sizing may be undersized for harder ores.
Source: Provided by the Company.

On the basis of these tests, the Company's milling experts and the milling-machinery vendor evaluated the probable throughput rate of the comminution circuit. Results of the evaluations are varied and RPM has determined the throughput of Semi-Autogenous (SAG) Mill – Ball-Mill grinding circuit based on the following:

- SAG milling is 50% as efficient as ball milling,
- Availability of the grinding circuit is 90%, and
- Amount of installed mill-motor power transmitted is 90%.

On this basis, the adequacy of the circuit to process the ore at the design rate is determined as shown:

Input data:

- Planned plant throughput is 140 ktpd.
- Two grinding lines each consisting of:
  - SAG Mill with installed motor power of 24,000 kW,
  - Ball Mill with installed motor power of 16,400 kW,
- Ball mill work index is 13.2 (Wi),
- Feed size to the grinding circuit is 80-percent passing 150 mm (150,000 µm) (F), and
- Product size from the grinding circuit is 80-percent passing 240 µm (P).

Planned throughput per grinding line:

$$= \frac{140{,}000/2}{0.92 \times 24} = 3{,}170 \text{ tph}$$

Available grinding power per grinding line:

$$= (24{,}000 \times 0.5 \times 0.9) + (16{,}400 \times 0.95) = 26{,}980 \text{ kW}$$

Available grinding power per tonne of ore:

$$= 26{,}980/3{,}170 = 8.5 \text{ kWh/t}$$

Grinding power required:

$$= \frac{10 \times Wi}{\sqrt{P}} - \frac{10 \times Wi}{\sqrt{F}} = \frac{10 \times 13.2}{\sqrt{240}} - \frac{10 \times 13.2}{\sqrt{150{,}000}} = 8.2 \text{ kWh/tonne}$$

Since the available grinding power exceeds the required grinding power, RPM expects the plant will be capable of grinding the ore at the design rate of 140 ktpd.

10.2.3 Flotation

The flotation testwork consisted of open and locked-cycle bench testwork and pilot-plant testwork. Much of the bench-scale data in the feasibility study is presented in graphical form. Summaries of significant data provided in numerical form are shown in ***Table 10-3***. The grade of the samples tested are about 50 percent higher than the planned average ore grade that will be milled; accordingly, it is expected that the recoveries and concentrate grades will be slightly less than the values obtained in the testwork.

Table 10-3 Ore and Concentrate Grades and Recoveries

Parameter	Units	Ore and Concentrate Grades & Recoveries			
		Copper	Moly.	Gold	Silver
Pilot-Plant Testwork					
Ferrobamba					
Ore Grade	% & g/t	1.2	300	0.09	6
Concentrate Grade	% & g/t	42	1.1	2.8	186
Recovery	%	88	79	65	73
Chalcobamba					
Ore Grade	% & g/t	1.1	220	0.03	4
Concentrate Grade	% & g/t	29	0.5	0.9	75
Recovery	%	90	77	57	54
Bench-Scale Testwork, Ferrobamba Global Composites					
Low Oxide Skarn-Porphyry, Blend Average					
Ore Grade	% & g/t	1.3	330	0.13	
Concentrate Grade	% & g/t	45	0.9		
Recovery	%	91	77		
Low Oxide Skarn-Porphyry, Average of Separate Samples					
Ore Grade	% & g/t	1.3	330	0.13	
Concentrate Grade	% & g/t	33	1.1		
Recovery	%	91	79		
Skarn Sulfide and Oxide Medium Oxide, Average of Separate Samples					
Ore Grade	% & g/t	1.6	260	0.17	
Concentrate Grade	% & g/t	52	0.7		
Recovery	%	75	61		

RPM Conclusions:
1. *Average copper recovery for Ferrobamba ore will be about 87 percent*
2. *Average copper recovery for Chalcobamba ore will be about 89 percent*
3. *Average concentrate grade for Ferrobamba will be about 40 percent copper*
4. *Average concentrate grade for Chalcobamba ore will be about 30 percent copper*
5. *Average molybdenum recovery will be about 60 percent, assuming about 75 percent recovery from bulk concentrate*
6. *Average gold recovery will be about 60 percent*
7. *Average silver recovery will be about 65 percent*

Source: Provided by the Company.

Recoveries used for ore-reserve determination are shown in ***Table 10-4***. RPM concludes the forecast recoveries used for production projections match testwork results.

Table 10-4 Ore Reserve Parameters

Ore Type	Recoveries (percent)			
	Copper	Moly.	Gold	Silver
Data Including All Ore Types				
Ferrobamba				
Skarn low oxide	90	58	65	70
Skarn medium oxide	85	66	65	65
Porphyry low oxide	90	80	65	70
Porphyry medium oxide*	66	40	55	65
Breccia*	75	60	65	70
Weighted Average	**87**	**70**	**64**	**69**
Chalcobamba				
Skarn magnetite low oxide	88	55	65	70
Skarn magnetite medium oxide*	72	40	65	60
Skarn sullfide low oxide	90	55	65	75
Skarn sullfide medium oxide*	72	40	65	60
Porphyry low oxide	88	65	65	50
Porphyry medium oxide*	70	50	65	40
Breccia*	70	50	65	40
Unweighted Average	**83**	**54**	**65**	**59**
Data Excluding Poor-Performing Ore Types				
Ferrobamba				
Skarn low oxide	90	58	65	70
Skarn medium oxide	85	66	65	65
Porphyry low oxide	90	80	65	70
Unweighted Average	**88**	**68**	**65**	**68**
Chalcobamba				
Skarn magnetite low oxide	88	55	65	70
Skarn sullfide low oxide	90	55	65	75
Porphyry low oxide	88	65	65	50
Unweighted Average	**89**	**58**	**65**	**65**

** Poor performing ore types*
RPM Conclusions:
1. Recoveries, excluding poor-performing ore types, match testwork results and production projections
Source: Provided by the Company.

Limited testing of Mo separation from the bulk Cu-Mo concentrate has been undertaken. Such testwork is always difficult to accomplish for Cu/Mo projects because of the limited amount of sample available and, as a result, is usually inconclusive. The limited testwork completed indicates 75% Mo recovery from the bulk concentrate and a concentrate grade of 46% to 47% Mo. The Project has assumed that the average recovery for the life of the Project will be 61% and that the concentrate grade will be 50% Mo. The recovery value appears reasonable with a recovery of about 80% into bulk concentrate and a recovery of about 75% from the bulk concentrate. The Mo concentrate grade projection appears optimistic; it is likely to be in the order of 45%, though this is acceptable and will result in only slightly higher treatment charge than that for higher grade concentrate.

Though not presented in this Report, metallurgical testwork has also been conducted on Sulfobamba ore, the results of which indicate it responds similarly to Chalcobamba ore.

10.3 Ore Processing Facility

Ore is planned to be processed in a conventional Cu-Mo froth flotation plant which will be feed from the pits via primary crushers and overland conveyors. Milling of the crushed ore will be carried out using SAG and ball mills prior to a bulk Cu-Mo flotation and Mo separation flotation from the bulk concentrate. Separate Cu and Mo concentrate thickening, filtration, and loadout systems will be used and a tailings thickening facility employed prior to impoundment of "thickened" tailings in a slurry dam adjoining the plant.

Principal ore-processing parameters are presented in ***Table 10-5*** and a listing of principal ore-processing equipment is provided in ***Table 10-6***.

Table 10-5 Principal Parameters

Parameter	Units	Value
Throughput		
Annually	million tonnes	51.1
Daily	thousand tonnes	140
Ore Grade		
Copper	percent	0.69
Molybdenum	ppm	168
Gold	grams/tonne	0.06
Silver	grams/tonne	3.2
Copper Concentrate		
Concentrate Grade		38
Recovery		
Copper	percent	86
Gold	percent	62
Silver	percent	62
Concentrate Quantity	ktonnes/year (dry)	800.0
Molybdenum Concentrate		
Concentrate Grade	percent molybdenum	50
Recovery	percent	63
Concentrate Quantity	ktonnes/year (dry)	11.0
Metal Production		
Copper	ktonnes/year	286.0
Molybdenum	ktonnes/year	5.1
Ore Work Index	kWh/tonne	13.2
Abrasion Index		0.25
Grind Size		
Primary crusher	80% passing, microns	150,000
Primary grind	80% passing, microns	240
Copper regrind	80% passing, microns	40
Molybdenum regrind	80% passing, microns	30
Power Required	megawatts	145
Water Required	m3/day	46,667
Capital Cost	US$ billions	~2.1
Operating Cost (typical - 2018)	US$/tonne milled	5.87

Source: Provided by the Company.

Table 10-6 Principal Equipment List

Item	Description	kW each	Oper.	S'by.
Primary Crushers				
Rock breaker	hydraulic drive	110		2
Dump pockets	720-tonne capacity		2	
Primary crushers	gyratory, 60- x 113-inches	750	2	
Surge pockets	720-tonne capacity		2	
Apron feeders	hydraulic drive, 2.1- x 10.9-m	320	2	
Sacrificial Conveyor	2.1- x 229-m, 5-m lift	710	1	
Overland Conveyor No. 1	gearless drive, 1.8- x 2,613-m, 223-m lift	8,800	1	
Overland Conveyor No. 2	gearless drive, 1.8- x 2,729-m, 227-m lift	8,800	1	
Crushed Ore Stockpile	open, conical, 105,000-tonnes live		1	
Primary Grinding				
Reclaim Apron Feeders	hydraulic drive, 1.5- x 9.4-m	56	6	2
SAG Mill Feed Conveyors	1.8- x 274-m, 7-m lift	566	2	
Mill Motor Chiller Units		217	12	
SAG Mills Liner Handler		90		1
SAG Mills	gearless drive, 40- x 22-ft EGL w/trommel	24,000	2	
SAG Mill Screens	3.7- x 7.3-m, 2-deck, 35- & 13-mm openings		2	1
Pebble Stockpile	open, conical, 1,750-tonnes live		1	
Pebble Crushers	MP-1000	746	2	1
Ball Mills	gearless drive, 26- x 40-ft EGL w/mag. trommel	16,400	2	
Cyclone Feed Pumps	7,300-m3/h, 35-m TDH	2,100	4	
Primary Cyclone Clusters	33-inch, 12 cyclones/cluster		4	
Copper-Molybdenum Flotation				
Rougher/Scavenger Flotn. Banks	7-row banks of 257-m3 cells, 300-kW ea.	2,100	4	
Rougher Conc. Regrind Mill	ISA mill, M3000	1,500	1	
Rougher-Scav. Conc. Regrind Mills	ISA mill, M3000	1,500	2	
Regrind Mills Cyclone Feed Pumps	1,400 m3/h, 32-m TDH	300	3	3
Regrind Mills Cyclone Clusters	15-inch, 10 cyclones/cluster		3	
First-Stage Cleaner Flotn. Bank	5-row bank of 160-m3 cells, 150-kW ea.	750	1	
Cleaner-Scavenger Flotn. Bank	5-row bank of 160-m3 cells, 150-kW ea.	750	1	
Second-Stage Cleaner Flotn. Bank	6-row bank of 100-m3 cells, 110-kW ea.	660	1	
Third-Stage Cleaner Flot. Bank	6-row bank of 70-m3 cells, 90-kW ea.	540	1	
Concentrate Thickener	hydraulic drive, 60-m dia.	45	1	
Tailings Thickeners	80-meter dia.	150	2	
Tailings Thickeners O'flow Pumps	horizontal, 2,500-m3/h @ 132-m TDH	1,500	3	1
Molybdenum Flotation				
Rougher Flotation Banks	6-row bank of 28.3-m3 cells, 55-kW ea.	330	2	
First-Stage Cleaner Flotn. Bank	3-row bank of 8.5-m3 cells, 22-kW ea.	66	1	
Cleaner-Scavenger Flotation Bank	5-row bank of 8.5-m3 cells, 22-kW ea.	110	1	
Regrind mill	ISA mill, M100	75	1	
Second-Stage Cleaner Flotn. Cells	column-type, 1,25- x 8-m, 2 cells in parallel		1	
Third-Stage Cleaner Flotn. Cell	column-type, 1,25- x 8-m, 1 cell only		1	
Concentrate thickener	17-m dia.	11	1	
Concentrate filter	pressure-type, 15-m2 area	11	1	
Concentrate dryer	screw-type, circulating oil, electrically-heated	600	1	
Concentrate bagger			1	
Copper Concentrate				
Concentrate Thickener	hydraulic drive, 60-m dia.	45	1	
Copper Conc. Filters	pressure-type, 422-m2 area	579	2	1
Copper Conc. Storage	enclosed building, 40,000 tonnes capacity		1	
Copper Conc. Loadout	front-end loader truck loadout	TBD	1	

Source: Provided by the Company.

A flow diagram of the process through generation of bulk concentrate is shown in ***Figures 10-1*** through ***10-5*** and that for Mo separation is shown in ***Figure 10-6***. A general arrangement layout of the ore-processing facilities as well as a layout of the entire project showing the location of the primary crushers, overland conveyors, and tailings dam is shown in ***Figure 10-7*** and ***Figure 10-8*** respectively.

10.3.1 Primary Crushing and Overland Conveying

The primary crushers will be located 5 km from the concentrator and 0.5 km from the edge of the final open pit perimeter. Ore from the mine will be dumped in 2 large gyratory crushers operated in parallel. Both crushers will have truck access from opposite sides, allowing four trucks to be in the dumping cycle simultaneously.

Crushed ore will discharge from the crushers by apron feeders onto a short sacrificial conveyor ahead of 2 sequential overland conveyors. The overland conveyors will be of about equal length and both will be driven by large gearless drives. Both conveyors will also incorporate single, wide radius horizontal curves.

The final conveyor will discharge to a large, single, uncovered, conical stockpile with sufficient live capacity for about 18 hr of operation.

Plans are to construct a 3rd primary crusher next to the Chalcobamba pit in full production Year 6 and feed a mixture of Ferrobamba, Chalcobamba and eventually Sulfobamba ore to the plant in succeeding years. The installation will require the construction of a new overland conveyor of 3 km, from Chalcobamba to the concentrator. The transport capacity of the conveyors is 9,400 tph, providing more than ample throughput rate.

10.3.2 Comminution

The comminution circuit will consist of 2 grinding lines, each consisting of 1 SAG and 1 ball mill. The design and construction allows for the later addition of a ball mill for each grinding line, if required.

Ore will be reclaimed from the conical stockpile via 8 variable speed drive apron feeders, 4 for each of the 2 grinding lines. It is intended to operate with 3 apron feeders per line with 1 unit on standby. The apron feeders will discharge to conveyors that feed the SAG mills. Ball bins and ball feeding systems for both the SAG and ball mills will be located on the stockpile bench.

The SAG mills will incorporate wraparound, gearless, variable speed drives. The SAG mills will incorporate small trommel screens which will discharge to vibrating screens. There will be no installed standby vibrating screens; the system is designed to allow rapid screen change out with a spare unit for each grinding line close at hand. Screen oversize will be conveyed to an open pebble stockpile ahead of 3 cone crushers which are designed to have 2 units in operation and 1 on standby. Cone crusher product will be conveyed to the feed conveyors ahead of the SAG mills.

SAG mill screen undersize will join the discharge from the ball mills in separate pump boxes for each grinding line. Two cyclone feed pumps on each grinding line will pump to 2 cyclone clusters for each grinding line. Cyclone underflows will feed the ball mills. The ball mills will, like the SAG mills, incorporate wraparound, gearless, variable speed drives. The ball mills will be fitted with magnetic trommel screens that will remove magnetic scats. Cyclone overflows will pass directly to the flotation circuit.

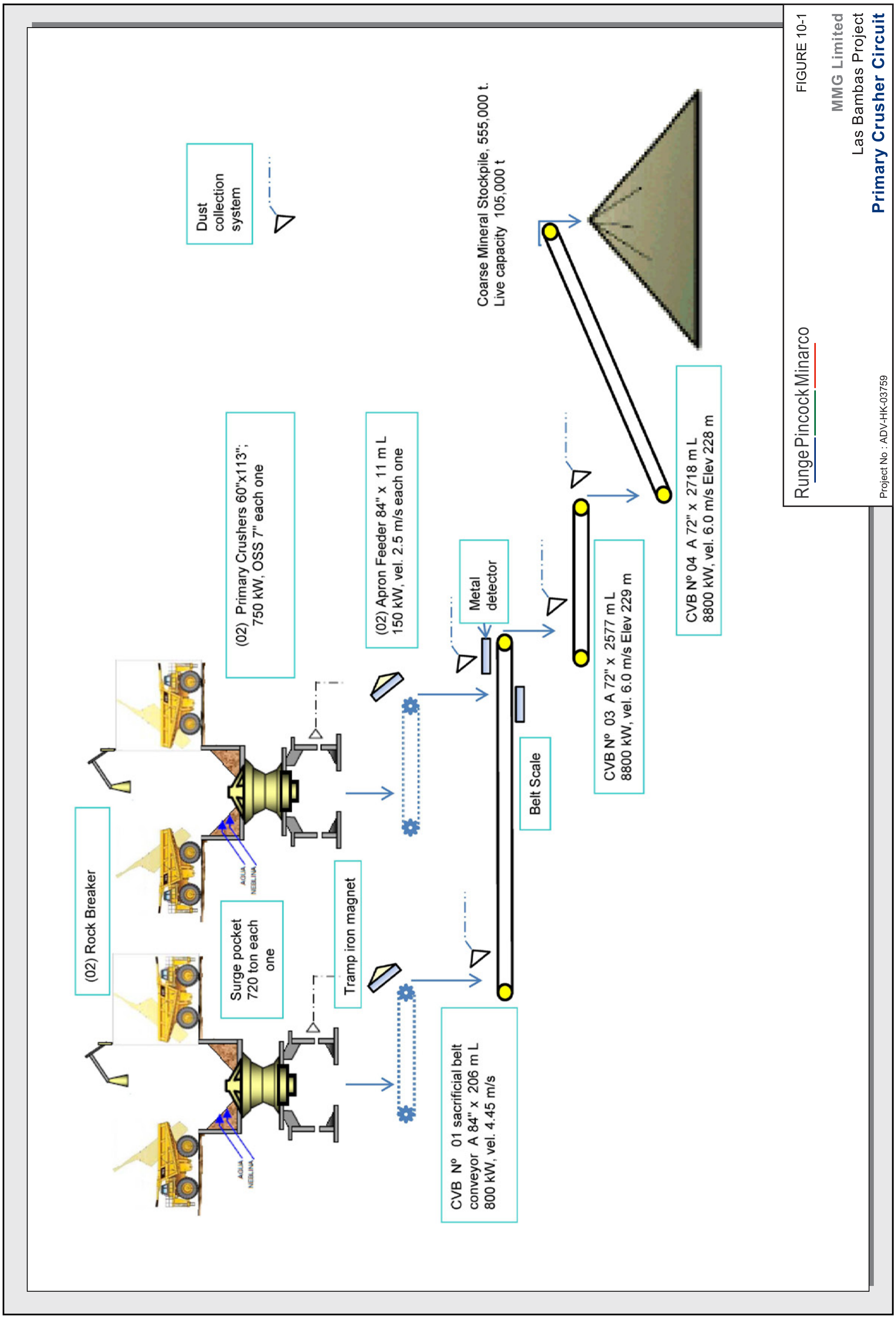


FIGURE 10-1
MMG Limited
Las Bambas Project
Primary Crusher Circuit

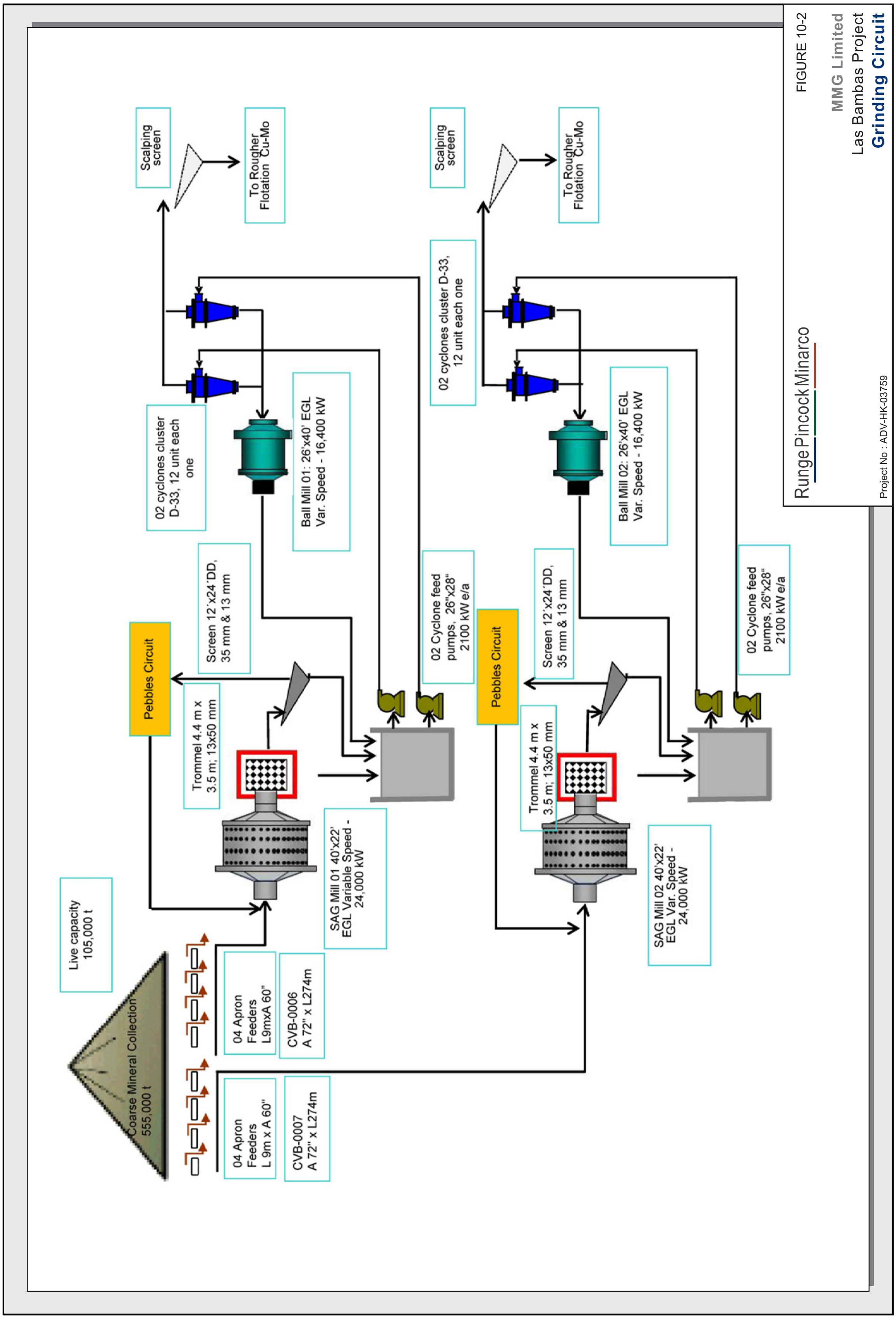
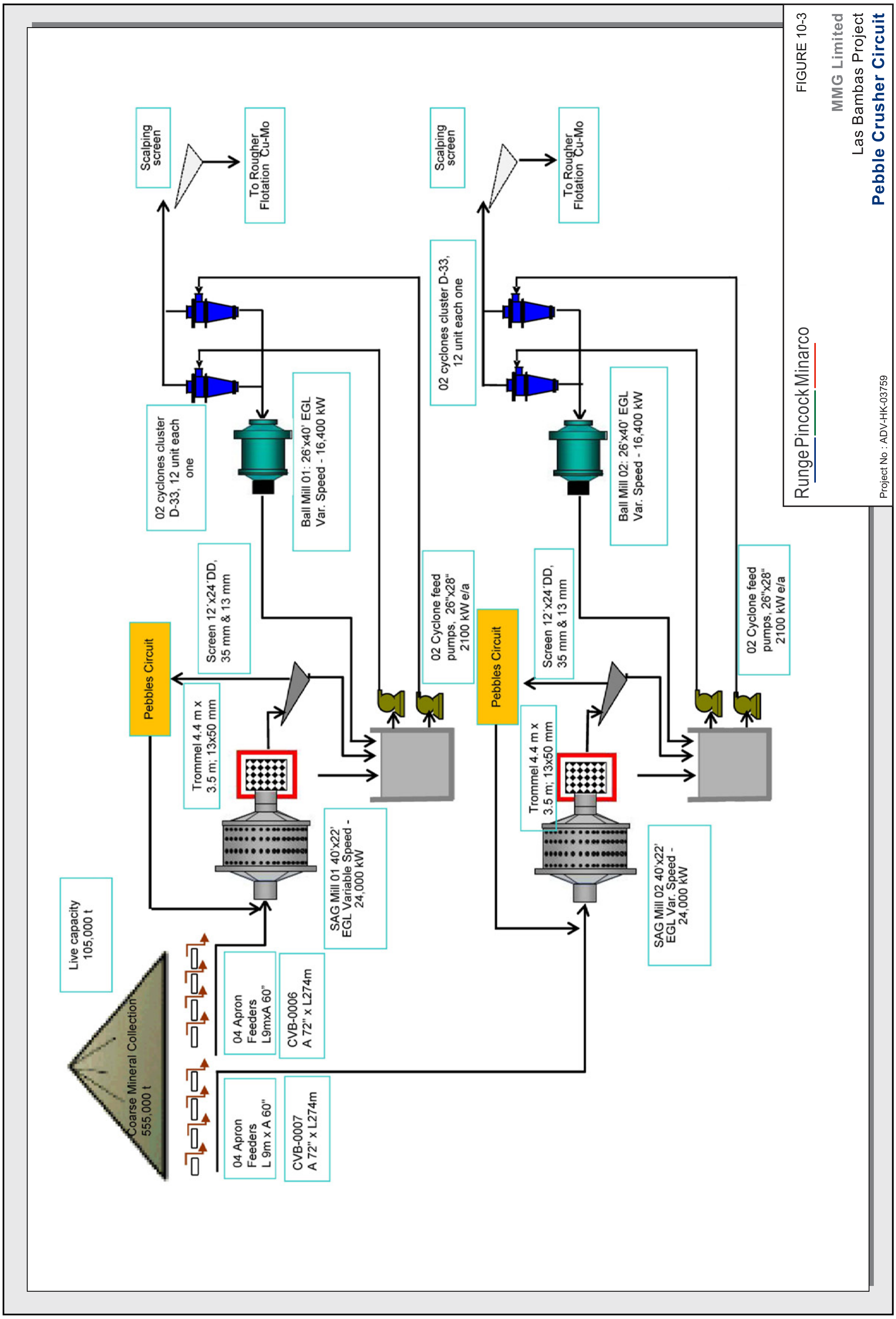


FIGURE 10-2
MMG Limited
Las Bambas Project
Grinding Circuit


Coarse Mineral Collection
555,000 t
Live capacity
105,000 t
04 Apron
Feeders
L 9m x A 60"
CVB-0007
A 72" x L274m
04 Apron
Feeders
L9mxA 60"
CVB-0006
A 72" x L274m
SAG Mill 01 40'x22'
EGL Variable Speed -
24,000 kW
SAG Mill 02 40'x22'
EGL Var. Speed -
24,000 kW
Trommel 4.4 m x
3.5 m; 13x50 mm
Pebbles Circuit
Screen 12'x24'DD,
35 mm & 13 mm
02 Cyclone feed
pumps, 26"x28"
2100 kW e/a
Ball Mill 01: 26'x40' EGL
Var. Speed - 16,400 kW
Ball Mill 02: 26'x40' EGL
Var. Speed - 16,400 kW
02 cyclones cluster
D-33, 12 unit each
one
02 cyclones cluster D-33,
12 unit each one
Scalping
screen
To Rougher
Flotation Cu-Mo
Runge Pincock Minarco
Project No : ADV-HK-03759
FIGURE 10-3
MMG Limited
Las Bambas Project
Pebble Crusher Circuit

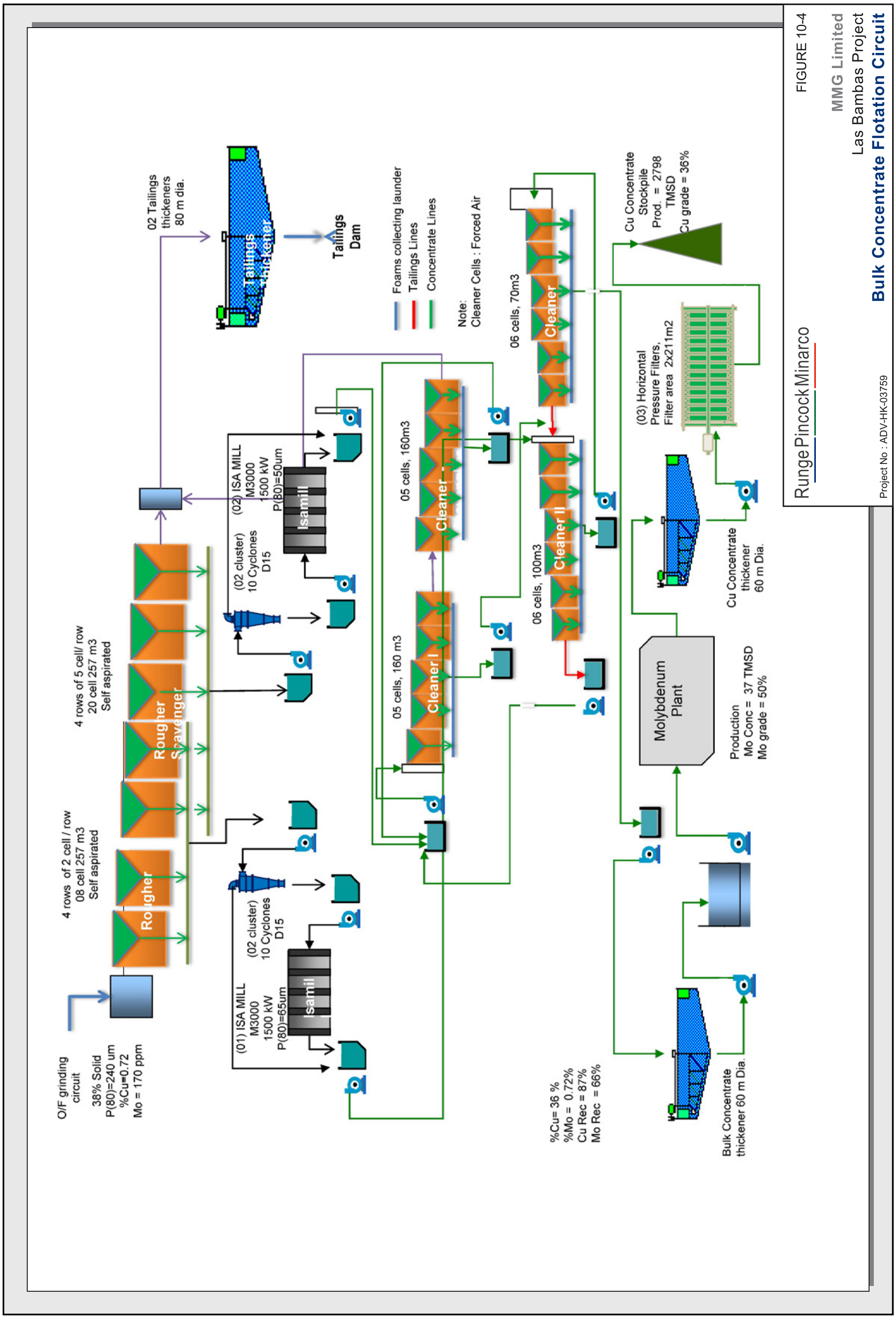


FIGURE 10-4
MMG Limited
Las Bambas Project
Bulk Concentrate Flotation Circuit
RungePincockMinarco
Project No : ADV-HK-03759
O/F grinding circuit
38% Solid
P(80)=240 um
%Cu=0.72
Mo = 170 ppm
4 rows of 2 cell / row
08 cell 257 m3
Self aspirated
Rougher
4 rows of 5 cell/ row
20 cell 257 m3
Self aspirated
Rougher Scavenger
02 Tailings thickeners 80 m dia.
Tailings Thickener
Tailings Dam
Foams collecting launder
Tailings Lines
Concentrate Lines
Note:
Cleaner Cells : Forced Air
(01) ISA MILL
M3000
1500 kW
P(80)=65um
Isamill
(02 cluster)
10 Cyclones
D15
(02) ISA MILL
M3000
1500 kW
P(80)=50um
Isamill
05 cells, 160 m3
Cleaner I
05 cells, 160m3
Cleaner
06 cells, 100m3
Cleaner II
06 cells, 70m3
Cleaner
Cu Concentrate Stockpile
Prod. = 2798 TMSD
Cu grade = 36%
(03) Horizontal Pressure Filters, Filter area 2x211m2
Cu Concentrate thickener 60 m Dia.
Molybdenum Plant
Production
Mo Conc = 37 TMSD
Mo grade = 50%
%Cu= 36 %
%Mo = 0.72%
Cu Rec = 87%
Mo Rec = 66%
Bulk Concentrate thickener 60 m Dia.

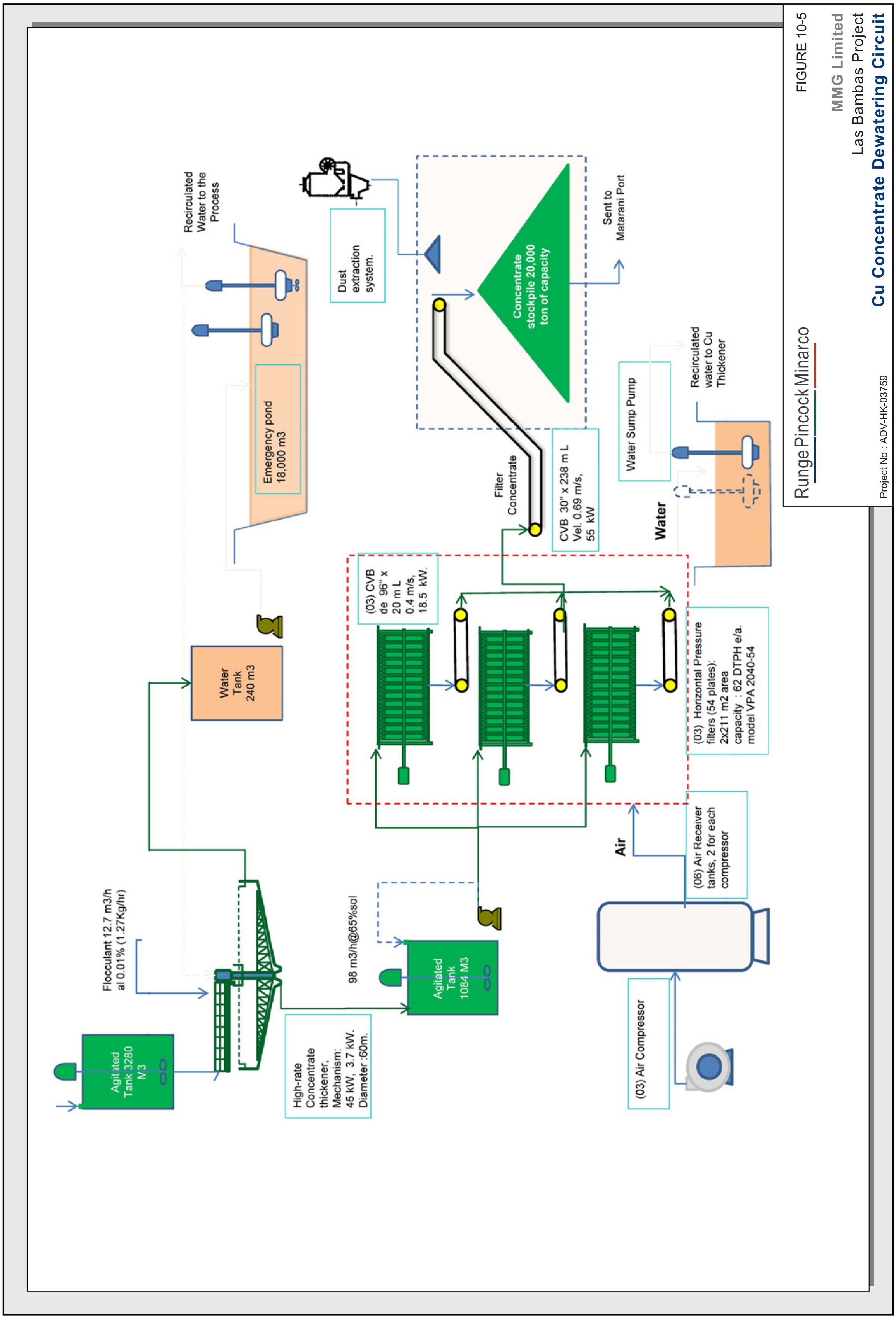
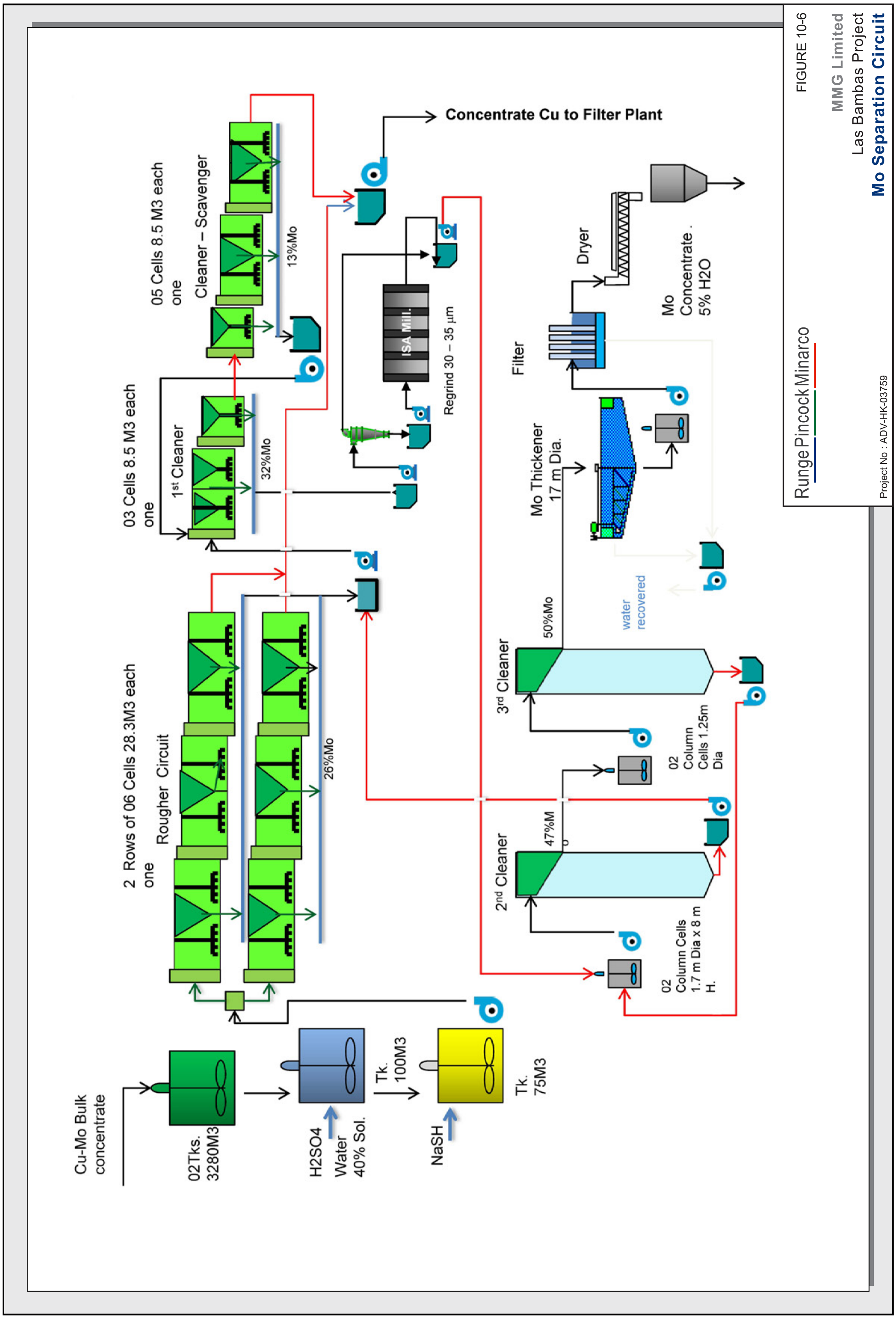


FIGURE 10-5
MMG Limited
Las Bambas Project
Cu Concentrate Dewatering Circuit
RungePincockMinarco
Project No : ADV-HK-03759
Agitated Tank 3280 M3
Flocculant 12.7 m3/h al 0.01% (1.27Kg/hr)
High-rate Concentrate thickener, Mechanism: 45 kW, 3.7 kW. Diameter :60m.
98 m3/h@65%sol
Agitated Tank 1084 M3
(03) Air Compressor
(06) Air Receiver tanks, 2 for each compressor
Air
Water Tank 240 m3
Emergency pond 18,000 m3
Recirculated Water to the Process
(03) CVB de 96" x 20 m L 0.4 m/s, 18.5 kW.
(03) Horizontal Pressure filters (54 plates): 2x211 m2 area capacity : 62 DTPH e/a. model VPA 2040-54
Filter Concentrate
CVB 30" x 238 m L Vel. 0.69 m/s, 55 kW
Dust extraction system.
Concentrate stockpile 20,000 ton of capacity
Sent to Matarani Port
Water
Water Sump Pump
Recirculated water to Cu Thickener


Cu-Mo Bulk concentrate
02Tks. 3280M3
H2SO4 Water 40% Sol.
Tk. 100M3
NaSH
Tk. 75M3
2 Rows of 06 Cells 28.3M3 each one
Rougher Circuit
26%Mo
03 Cells 8.5 M3 each one
1st Cleaner
32%Mo
05 Cells 8.5 M3 each one
Cleaner – Scavenger
13%Mo
Concentrate Cu to Filter Plant
ISA Mill.
Regrind 30 – 35 µm
2nd Cleaner
47%M
02 Column Cells 1.7 m Dia x 8 m H.
3rd Cleaner
50%Mo
02 Column Cells 1.25m Dia
water recovered
Mo Thickener 17 m Dia.
Filter
Dryer
Mo Concentrate. 5% H2O
FIGURE 10-6
MMG Limited
Las Bambas Project
Mo Separation Circuit
Runge Pincock Minarco
Project No : ADV-HK-03759

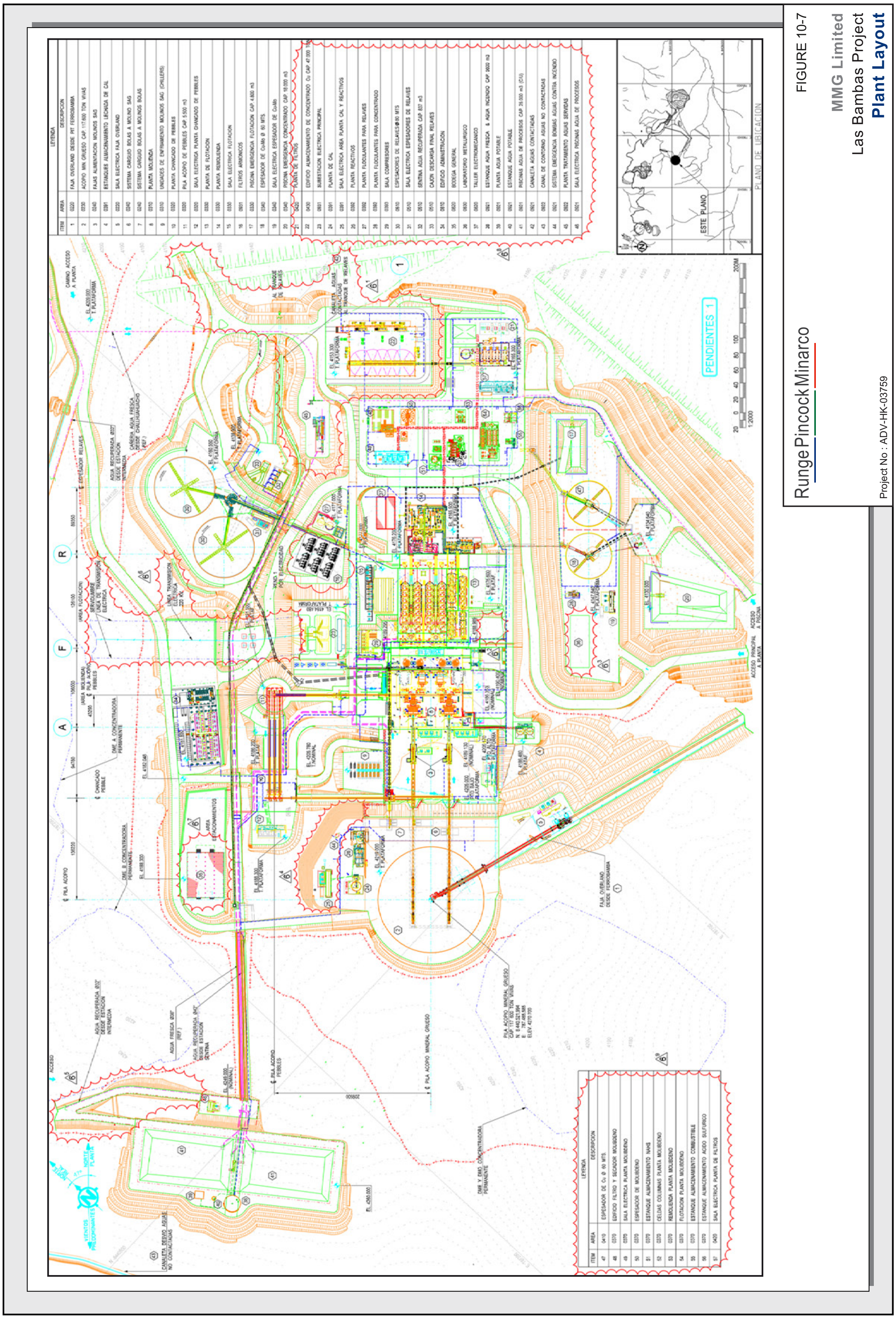


FIGURE 10-7
MMG Limited
Las Bambas Project
Plant Layout
Runge Pincock Minarco
Project No : ADV-HK-03759

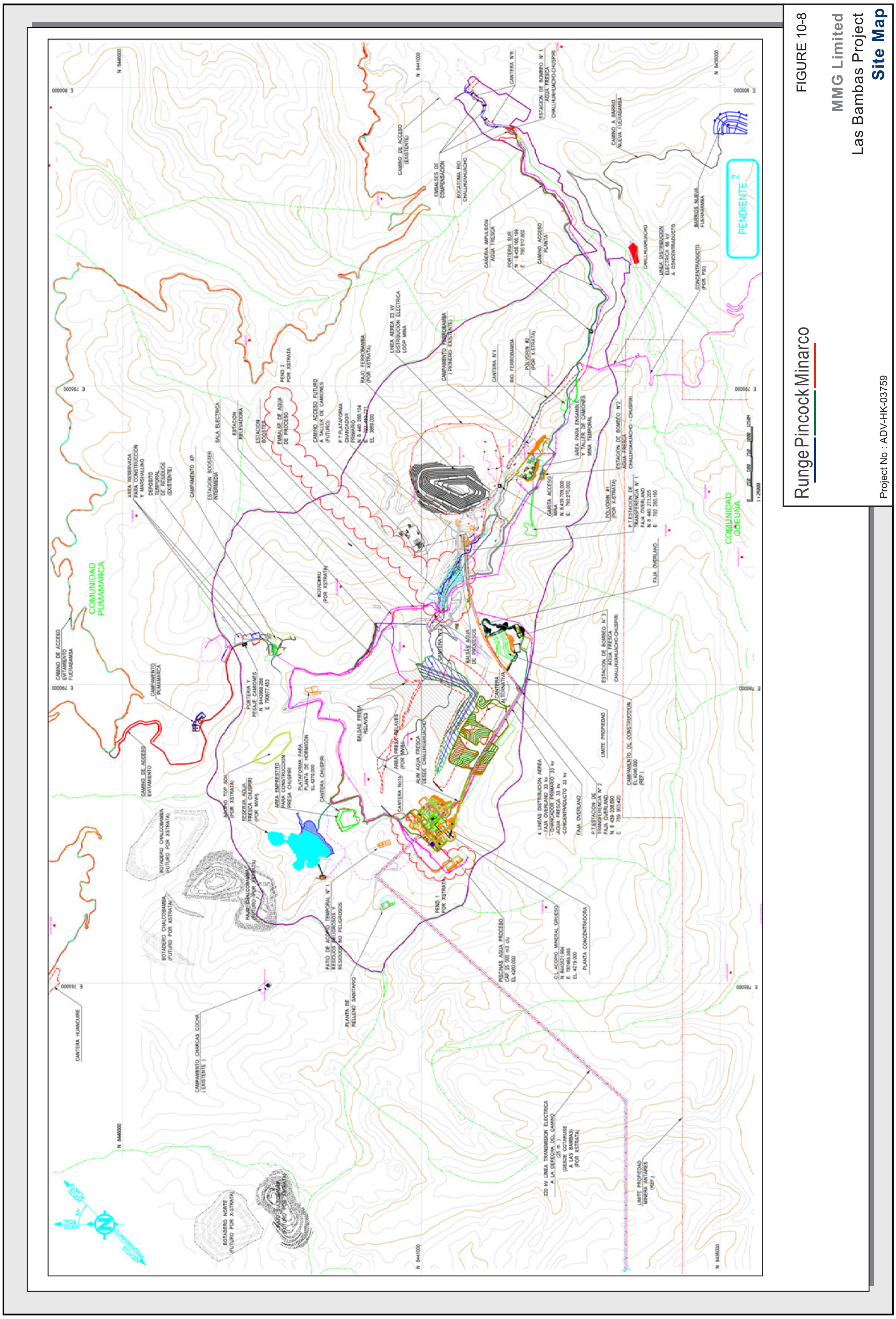


FIGURE 10-8
MMG Limited
Las Bambas Project
Site Map
Runge Pincock Minarco
Project No : ADV-HK-03759
COMUNIDAD PUMAMARCA
COMUNIDAD QUEUÑA
PENDIENTE 2

10.3.3 Bulk Flotation

The rougher flotation circuit will consist of 4 banks of 7-in-series tank cells. The first 2 tanks in each bank will serve as roughers and the remaining 5 as rougher-scavengers. The circuit will allow switching of the 3rd and 4th cells in each bank to produce either rougher or rougher scavenger concentrate as required.

The rougher and rougher scavenger concentrates will flow to separate regrind circuits, one for rougher concentrate and two for rougher scavenger concentrate. Both regrind circuits incorporate large surge tanks to allow for fluctuation in feed rate. Each regrind circuit will incorporate cyclones ahead of ISA mills and cyclone overflow will be combined with ISA mill product and feed the cleaner flotation circuit.

Reground rougher and rougher-scavenger concentrates will be combined and fed to a single bank of 6 first-stage cleaner cells followed by a 6 scavenger-cleaner cells. Scavenger-cleaner concentrate will be recycled to the head of the first-stage cleaners; scavenger-cleaner tails will join the rougher tails. Two further stages of cleaning will follow with tailings from each stage recycled to the head of the preceding stage. Final concentrate will be pumped to a bulk-concentrate thickener.

Rougher and cleaner-scavenger tails will be sent by gravity to 2 tailings thickeners that will operate in parallel. Thickener underflow will gravitate to the tailing dam which will be located just to the southeast of the concentrator.

10.3.4 Mo Separation

Bulk concentrate will be piped to a Mo separation plant adjoining the bulk flotation plant. Bulk concentrate will be conditioned in 2 conditioning tanks in series and a rougher concentrate will be generated by 2 banks of 6 cells in series. Rougher tails will constitute the final Cu concentrate and will pass to the Cu concentrate thickening and filtering plant.

Rougher concentrate will be pumped to the first stage cleaner consisting of 3 cells in series followed by a bank of 5 cleaner scavenger cells in series. Cleaner scavenger concentrate will be recycled to the head of the first stage cleaners; cleaner scavenger tails will join the rougher tails as part of the final Cu concentrate.

First stage cleaner concentrate will pass to a regrind circuit where the concentrates will be first cycloned with the cyclone underflow going to an ISA mill and the cyclone overflow and mill product going to 2 further stages of cleaning using column cells. The 2nd cleaner will use 2 column cells in parallel; the 3rd cleaner will consist of a single column cell. Tailings from each of the further stages of cleaning will be recycled to the head of the preceding stage. Rougher concentrate will pass to a Mo concentrate thickener.

10.3.5 Concentrate Filtering, Drying, and Loadout

Concentrate from the Cu concentrate thickener will be filtered on plate-and-frame pressure filters with 2 filters in operation and 1 on standby. Filtered concentrate will be stored in a 40,000-t capacity covered storage area and then loaded by front-end-loader onto a tube conveyor that will discharge to trucks.

Concentrate from the Mo concentrate thickener will be filtered on a plate-and-frame type pressure filter and filter cake will be dried in a screw dryer through which hot oil is circulated. Dried concentrate will be placed in canvas super sacks.

As indicated in ***Table 10-5***, the table of ore-processing parameters, the plant will generate about 0.8 million dry tonnes per year of Cu concentrate and about 11,000 dry tonnes of Mo concentrate when processing average-grade ore. The ore grade in the initial 5 years will be closer to 1.00-percent Cu which will result in the production of about 1.1-million dry tonnes of Cu concentrate per year, the equivalent of about 3,500 wet tonnes of concentrate per day.

10.4 Tailings Storage

The tailings storage facility (TSF) site will be located in the upper part of the Ferrobamba Valley, immediately east of the processing plant. The design uses high-density thickened tailings deposition technology and a rockfill containment dam constructed of waste rock from the Ferrobamba pit. The general TSF layout is shown in ***Figure 10-9***. The TSF will have capacity to store 582 Mm^3 of tailings, equal to 960 Mt of tailings or 983 Mt of ore.

The containment dam required at this site has an L-shape in plan view, which extends along the east and south sides of the TSF. The eastern portion is the main containment that closes the downstream side of the TSF, while the southern portion provides lateral closure. Additionally, there is a dike at the upstream end of the impoundment (southwest) to prevent tailings from flooding the plant area.

The containment dam will be raised progressively by the downstream construction method as the TSF grows. The additional dike at the upstream end of the impoundment will be constructed in one single stage prior to the tailings reaching the area adjacent to the plant (approximately Year 8).

Tailings will be processed to be discharged as high-density thickened tailings slurry, with 62 percent solids concentration. Water recovered from the thickening overflow will be recirculated to the plant. For the initial operation of the TSF, tailings will be discharged by gravity to the upper end of the TSF near the plant. The plant design includes provision for pumping the thickened tailings but the pumps will not be installed until the rheological characteristics of the tailings are established through actual operation. The planned tailings placement method, which is subject to change depending on actual rheological characteristics of the tailings, is to discharge the thickened tailings from the upstream end of the impoundment (west) and from the impoundment sides (north and south) by means of multiple "spigots" consisting of discharge pipes with lengths of up to about 300 m. This design considers that the tailings will form a final average beach slope of 0.5 % sloping from the discharge spigots towards a supernatant water pond.

The containment dam will be constructed with waste rock from the Ferrobamba pit. It will have a maximum height of 220 m and will be raised sequentially by the downstream method, starting from an 80-m high starter embankment. The upstream face will have a slope of 1.75H:1V as determined from the latest ATC Williams information. The downstream slope will be 1.75H:1V. The upstream slope will be covered with a polyvinyl chloride ("PVC") or a linear low-density polyethylene ("LLDPE") geocomposite liner installed on concrete curbs. A concrete plinth will be placed in a trench excavated to competent rock on the upstream toe of the dam and a cement-grout cut-off curtain established under the plinth to control infiltration from the impoundment.

The water associated with the TSF includes direct precipitation on the impoundment area, water expelled from the tailings due to consolidation. Contact water also includes runoff from upslope areas not intercepted by the non-contact water diversion channel during major storm events. Water will be collected in a supernatant water pond located in the central part of the impoundment toward its northeast corner, against the upstream slope of the containment dam. Water in the impoundment dam will be pumped to the plant using a floating barge pump in the supernatant pond. Although RPM understands this is current design, the final design prior to implementation is yet to be finalised and ongoing reviews are occurring to determine the best method prior to construction.

Stability analyses were performed for static and seismic loading conditions and indicate adequate factors of safety.

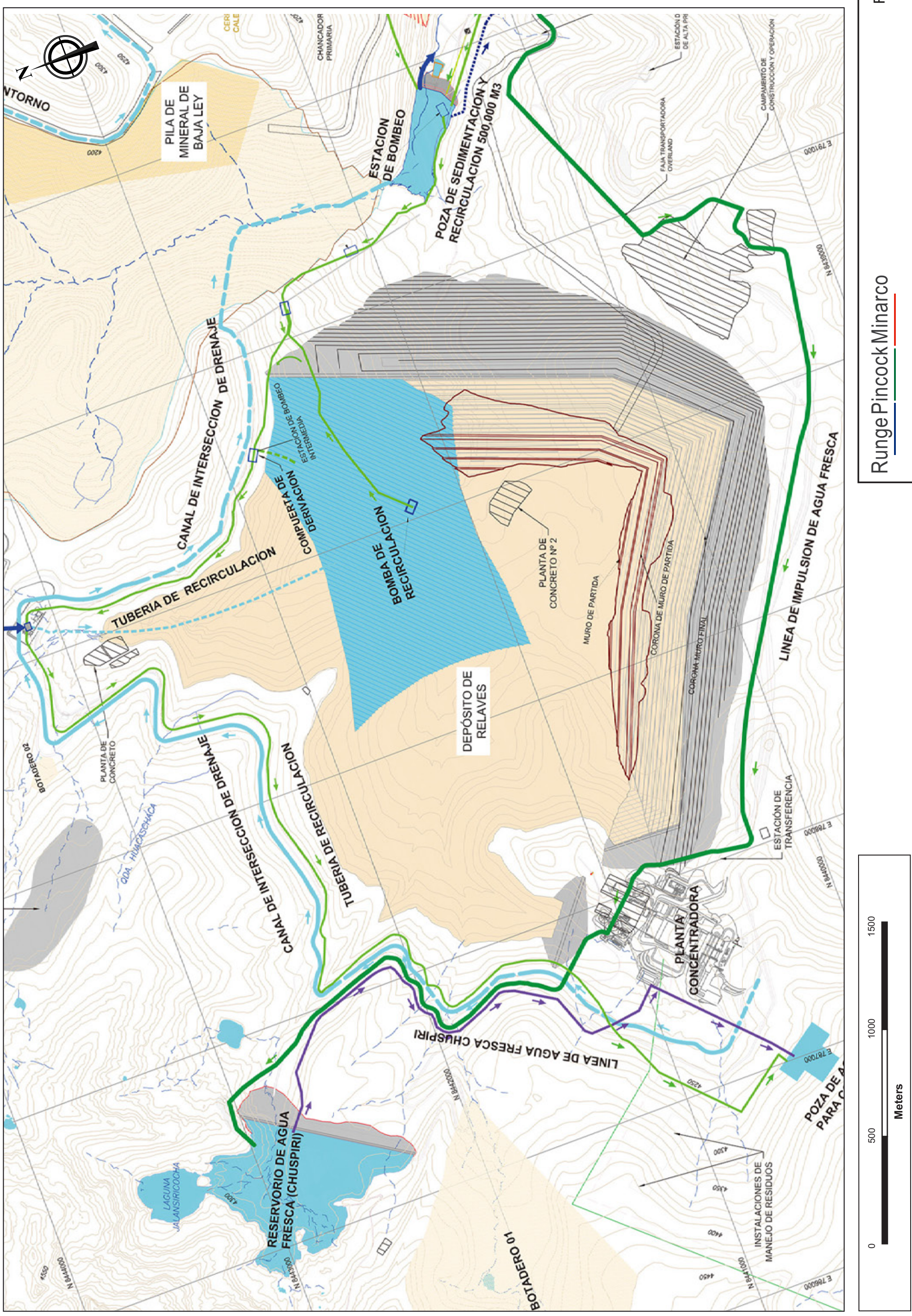


FIGURE 10-9

Runge Pincock Minarco

MMG Limited
Las Bambas Project
Tailings Storage Facility Layout

Project No : ADV-HK-03759

RungePincockMinarco

11 Infrastructure, Concentrate Transportation, and Administration

11.1 Summary

The Project is in a remote and isolated location with little infrastructure in the vicinity prior to Project development commencing, accordingly the infrastructure requirements are extensive. The principal non-mining or processing and concentrator infrastructure items include:

- A new 250 km access road;
- A new 130 km 220-kV power line;
- A 4.2 Mm3 capacity fresh-water dam built using nearby sourced material;
- A 0.5 Mm3 capacity sedimentation-pond dam built using mine waste rock;
- A 0.5 Mm3 capacity clarification-pond dam built using mine waste rock;
- A 550 Mm^3 solid capacity tailings dam with mine waste rock from the Ferrobamba open pit;
- A 800 L/s capacity fresh water pumping system from a nearby river to the fresh-water dam at 600-m higher elevation;
- A 3,000 m^3/hr tailings-reclaim-water and sedimentation-pond-water pumping system to the ore-processing plant;
- The typical site complement of buildings, including offices, shops, laboratories, warehouses, etc.required to support mining and processing activities;
- A 2,000 bed permanent camp;
- A 450 house town and associated amenities to house local residents displaced by the Project;
- A series of communication towers to connect to Cusco and Espinar;
- Explosives magazines;
- Copper concentrate transportation system; and
- Molybdenum concentrate transportation system.

At full production the operation is planned to employ approximately 1,300 people of which approximately 300 will be on site contractors.

Plans are to mine the Ferrobamba deposit for the first 3 full-production years prior to blending in Chalcobamba ore in Year 4 and Sulfobamba ore in Year 6. Detailed infrastructure related plans for the Chalcobamba and Sulfobamba pits have yet to be developed, however the current plans are considered suitable and to a prefeasibility study level as required by the JORC Code

RPM considers the infrastructure and administration plans suitable to support the planned production rates and underpin an Ore Reserve estimate.

11.2 Infrastructure, Excluding Water Systems

The principal infrastructure parameters of the Project, excluding water systems, are provided in ***Table 11-1***, and a listing of the groups of the non-water system components is provided in ***Table 11-2***.

As shown in ***Table 11-1***, total power requirements for the Project are considerable, at 180 MW excluding application of utilization factors. Most of the power will be consumed by the plant, amounting to about 25 kWhr/t milled, which is considered in line with similar operations for large scale Cu concentrators. The Project's mining operations will use electric shovels and drills which will also add significant power consumption as will be the water pumping systems. The mining operations will be the only significant consumer of fuel with an estimated consumption of 210 kl/d, the equivalent of about 6 fuel tank trucks per day. Each of the major components is described in ***Table 11-1 through to 11-2***..

Table 11-1 Principal Parameters, Excluding Water

Parameters	Units	Value	Comments
Power Requirements			
Mine	MW	17	
Ore processing	MW	145	
Infrastructure	MW	18	
Total	MW	180	Excluding application of utilization factors
Fuel Requirement	L/day	210,000	RPM estimate based on 0.5 liters/tonne moved
Personnel Requirements			
Administration	people	323	Company estimate
Mining	people	531	Company estimate
Ore processing	people	350	Company estimate
Contractors (located on site)	people	300	RPM estimate
Total	people	1,504	
Infrastructure Cost	US$ billions	~2.3	
G&A Cost			
Annual	US$ millions	49	
Unit (typical - 2018)	US$/tonne milled	0.96	

Source: Provided by the Company.

Table 11-2 Principal Facilities, Excluding Water

Item	Description
Roads	
Access road	A Heavy Haul Road (HHR) that includes part of the Cusco-Las Bambas road with the remainder consisting of a new road from Espinar to the junction with the Cusco-Las Bambas road; road is mostly gravel surface; overall length is ~280 km. Route between Espinar and Imata is currently being paved by the Transport Authorities.
Internal roads	~70 km of gravel-surface 2-lane roads
Power Supply System	
Cotaruse - Las Bambas line	Dual circuit 225 MW capacity, 220 kV, double line; 130 km long
Harmonic stabilizers	Included
Main substation	3 transformers (2 op., 1 s'by.) 220kV to 33kV
Emergency generators	4 MW at concentrator; 12 MW at the MCC camp
Fuel Supply System	2 each 1.3-million-liter tanks
Operational Buildings	Usual complement of offices, laboratory, workshops, warehouses, and change houses
Permanent Camp	Will use existing construction camp at the Main Construction Camp ("MCC")
Fuerabamba Village	Complete town of 450 houses for displaced persons plus all amenities
Communications Systems	Series of communications towers from the Project to Cusco
Waste and Sewage Systems	Sanitary fill on west side of site; several separate sewage systems for locations through site
Explosives Magazines	Two separate explosives magazine located south of the Ferrobamba pit
Mobile Equipment	Mobile cranes, bulldozer, front-end loaders, trucks, and forklifts

Source: Provided by the Company.