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Aditya Birla Minerals Limited

ASX RELEASE

Mineral Resource Estimation Update as at 31st March 2016

16th May 2016

For Further Information

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ADITYA BIRLA MINERALS LIMITED

Mineral Resource Estimation Update

31st March 2016

Highlights

Aditya Birla Minerals Limited (ASX – ABY) ("Aditya Birla" or "The Company") is pleased to announce an updated total in-situ Mineral Resource at the Company's Copper Operations of 79.73mt @ 1.28 % Cu for 1.02mt of contained copper.

- The "in-situ Sulphide" Mineral Resource for the Nifty Copper Operations as at 31/03/2016 totals 23.46Mt @ 2.03% Cu above a reporting cut-off grade 1.2% Cu.
- The "in-situ Oxide" Mineral Resource for the Nifty Copper project as at 31/03/2016 totals 4.33Mt @ 0.86% Cu above a reporting cut-off grade 0.4% Cu.
- The in-situ Mineral Resource for the Nifty Copper Project Heap Leach Pad **("Pad")** as at 31/03/2016 totals 3.31Mt @ 0.74% Cu at a cut-off grade 0.5% Cu.
- The "in-situ Oxide and Supergene" Mineral Resource for the Maroochydore Copper project as at 31/03/2016 totals 43.20Mt @ 0.91% Cu and 391ppm Co above a reporting cut-off grade 0.5% Cu.
- The "in-situ Sulphide" Mineral Resource for the Maroochydore Copper project as at 31/03/2016 totals 5.43Mt @ 1.66% Cu and 292ppm Co above a reporting cut-off grade 1.1% Cu.

Nifty Mineral Resource

The in-situ Sulphide Mineral Resource total has been adjusted for model updates and mining during the period between 01/04/2015 – 31/03/2016.

Changes to the in-situ Sulphide Mineral Resource since the last annual reporting for the Nifty Copper Operations include: -

- Updates to the Sulphide Mineral Resource model for Nifty to include additional geological information and ongoing re-interpretation.
- A revised estimation methodology.
- Changes to resource classifications to better reflect production results.
- Allowance for the full year production from the underground mine.

The Nifty Mineral Resource was updated using all appropriate information as at 31st March 2016 by Mr Sean Sivasamy (Sivasamy) of Aditya Birla Minerals Limited.

Production during the previous twelve months was depleted from the updated Sulphide Mineral Resource Model and the Nifty sulphide resource is now reported as 23.46Mt @ 2.03% at a cut-off grade of 1.2% Cu.

The Oxide and Supergene Resource for Nifty tonnes now reports at 4.33Mt @ 0.86% at a cut-off grade of 0.4% Cu, which also remained same as reported at 31st March 2015.

The Heap Leach Pad Mineral Resource for the Nifty Project remains same as estimated as at 31st March 2015 by DataGeo and totals to 3.31Mt at 0.74% Cu at a cut-off grade of 0.5% Cu.

The Mineral Resource has been classified and reported in accordance with the 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC, 2012).

The Nifty sulphide depletion work was carried out by Mr Sivasamy. The Nifty copper operation Mineral Resources are shown in Table 1.

Table 1 Nifty Deposit Mineral Resource as at 31st March 2016

MINTYPE	Cut-Off	CAT	Tonnes (Mt)	Cu %
Chalcocite and Chalcopyrite	1.2	Measured	17.34	2.16
		Indicated	3.29	1.80
		Inferred	2.83	1.52
Sub Total			***23.46***	***2.03***
Oxide	0.4	Measured	1.43	0.91
		Indicated	1.22	0.86
		Inferred	1.68	0.83
Sub Total			**4.33**	**0.86**
Heap Leach Pad	0.5	Measured	-	-
		Indicated	2.85	0.75
		Inferred	0.46	0.66
Sub Total			***3.31***	***0.74***
Total			**31.10**	**1.73**

Maroochydore Mineral Resource

The "in situ Oxide and Supergene" Mineral Resource for the Maroochydore Project as at 31st March 2016 remains same as estimated at 31st March 2013 by DataGeo. The Maroochydore Mineral Resource is 43.20 Mt @ 0.91% Cu and 391 ppm Co above 0.5% Cu cut-off grade.

The "In situ Sulphide" Mineral Resource for the Maroochydore copper project as at 31st March 2016 remains same as estimated at 31st March 2014 by Mr Sivasamy. The Sulphide Mineral Resource is 5.43Mt at 1.66% Cu and 292ppm Co above cut-off grade 1.1% Cu.

The Mineral Resource has been classified and reported in accordance with the 2012 Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC, 2012).

The Maroochydore Oxide and Sulphide Mineral Resources are shown in Table 2.

Table 2 Maroochydore Mineral Resource as at 31st March 2016

Cut-off	Min Type	Cat	Tonnes (Mt)	Cu%	Co ppm
0.5	Oxide	Measured	–	–	–
		Indicated	40.80	0.92	388
		Inferred	2.40	0.81	451
Sub Total			*43.20*	*0.91*	*391*
1.1	Sulphide	Measured	–	–	–
		Indicated	–	–	–
		Inferred	5.43	1.66	292
Sub Total			*5.43*	*1.66*	*292*
Total			**48.63**	**1.00**	**380**

Aditya Birla Mineral Resource Changes

RESOURCE RECONCILIATION									
Project	**31st March 2016 Resource**			**31st March 2015 Resource**			**Difference**		
	Tonnes (Mt)	Cu Grade (%)	Co Grade (PPM)	Tonnes (Mt)	Cu Grade (%)	Co Grade (PPM)	Tonnes (Mt)	Cu Grade (%)	Co Grade (PPM)
Nifty Sulphide	23.46	2.03	-	25.25	2.11	-	-1.79	-0.08	-
Nifty Oxide	4.33	0.86	-	4.33	0.87	-	-	-0.01	-
Nifty Heap Leach Pad	3.31	0.74	-	3.31	0.74	-	-	-	-
Maroochydore Oxide	43.20	0.91	391	43.20	0.91	391	-	-	-
Maroochydore Sulphide	5.43	1.66	292	5.43	1.66	292	-	-	-
Total	**79.73**	**1.28**		**81.52**	**1.32**		**-1.79**	**-0.04**	**-**

Small discrepancies may occur due to the effects of rounding

Appendix – 1 Aditya Birla Minerals Limited Mineral Resources as at 31st March 2016

	Cut-off Grade	Measured Resource		Indicated Resource			Inferred Resource			Total Resource		
NIFTY COPPER OPERATIONS – Mineral Resources as at 31st March 2016												
	%	Tonnes (Mt)	Cu %	Tonnes (Mt)	Cu %	Co ppm	Tonnes (Mt)	Cu %	Co ppm	Tonnes (Mt)	Cu %	Co ppm
In situ Oxide	0.4	1.43	0.91	1.22	0.86	–	1.68	0.83	–	4.33	0.86	–
Sub Total Oxide		**1.43**	**0.91**	**1.22**	**0.86**	–	**1.68**	**0.83**	–	**4.33**	**0.86**	–
In situ Sulphide	1.2	17.34	2.16	3.29	1.80	–	2.83	1.52	–	23.46	2.03	–
Broken Ore Stocks – Sulphide	N/A	–	–	–	–	–	–	–	–	–	–	–
Sub Total Sulphide		**17.34**	**2.16**	**3.29**	**1.80**	–	**2.83**	**1.52**	–	**23.46**	**2.03**	–
Heap Leach Pad	0.5	–	–	2.85	0.75	–	0.46	0.66	–	3.31	0.74	–
Sub Total Heap Leach pad		–	–	**2.85**	**0.75**	–	**0.46**	**0.66**	–	**3.31**	**0.74**	–
Total Mineral Resource		**18.77**	**2.06**	**7.36**	**1.24**	–	**4.97**	**1.21**	–	**31.10**	**1.73**	–
MAROOCHYDORE COPPER PROJECT – Mineral Resources as at 31st March 2016												
In situ Oxide and Supergene	0.5	–	–	40.80	0.92	388	2.40	0.81	451	43.20	0.91	391
In situ Sulphide	1.1	–	–	–	–	–	5.43	1.66	292	5.43	1.66	292
Total Mineral Resource		–	–	**40.80**	**0.92**	**388**	**7.83**	**1.40**	**341**	**48.63**	**1.00**	**380**
GRAND TOTAL		**18.77**	**2.06**	**48.16**	**0.97**		**12.80**	**1.32**		**79.73**	**1.28**	

Small discrepancies may occur due to the effects of rounding

Competent Person Statement:

The information in this release that relates to Mineral Resources for the Nifty and Maroochydore deposits is based on and accurately reflects reports prepared by Mr Sean Sivasamy and Mr Peter Ball from 2013 to 2016.

Mr Sivasamy is a Member of the AusIMM and Mr Ball is a member of the AusIMM (CP-Geo). Mr Sivasamy and Mr Ball have the necessary experience relevant to the style of mineralisation, the type of deposit and the activity undertaken to qualify as a 'Competent Person' under the JORC Code for Reporting of Mineral Resources and Ore Reserves (2012 Edition). Mr Sivasamy and Mr Ball have given their consent to the inclusion of the material in the form and context in which it appears. Mr Sivasamy is a full time employee of Aditya Birla Minerals Limited (ABML). Mr Ball is Principal of DataGeo Geological Consultant (an independent geological consultancy).

The Measured and Indicated Mineral Resources tabled above are inclusive of those Mineral Resources modified to produce the Ore Reserve. In all Resources tables, significant figures do not imply precision. Figures are rounded according to JORC Code guidelines.

The depletion of the Mineral Resources for the Nifty Sulphide operation for the 2016 reporting is based on and accurately reflects information prepared by Mr Sivasamy. Mr Sivasamy is a Member of the AusIMM. Mr Sivasamy have the necessary experience relevant to the style of mineralisation, the type of deposit and the activity undertaken to qualify as a 'Competent Person' under the JORC Code for Reporting of Mineral Resources and Ore Reserves (2012 Edition). Mr Sivasamy has given his consent to the inclusion of the material in the form and context in which it appears. Mr Sivasamy is a full time employee of Aditya Birla Minerals Limited (ABML).

Section 1 Sampling Techniques and Data		
Criteria	**Explanation**	**Comments**
Sampling techniques	• *Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down whole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.*	The drilling and sampling data utilised for mineral resource estimation is as follows: Nifty Deposit has 798 diamond and RC holes containing 143,497m. Maroochydore has 294 diamond, RC and percussion holes totalling 45,500m. The holes for all deposits are drilled mostly perpendicular to the orientation of the mineralisation. The Nifty Heap Leach pad has been drilled and sampled using RC techniques in three programs with the holes on spacings ranging from 25m x 50m to 50m x 50m. In total 274 vertical holes totalling 3,921.5m have been drilled into the pad.
	• *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.*	Drilling and sample collection used industry standard techniques for diamond coring, RC and sludge sampling. Diamond sample representivity is assumed given the drilling is mostly perpendicular to the mineralisation and the very good core recovery achieved. Similarly orientated RC holes generate samples for each 1m drilled which are collected from the cyclone, sample recovery is generally reported as good although not recorded. Sludge samples are collected from the flushed return and copper grades were adjusted based on test results. For Nifty Heap Leach Pad 2014 and 2015 drilling the samples are collected over 1m intervals from the cyclone using a cone splitter. No information is available for how the 2007 samples were collected.

	• *Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (eg 'reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.*	For the diamond drilling the mineralised intervals and adjacent locations were sampled by cutting the core in 1/2 based on the logging. The preparation and analysis was undertaken at an accredited commercial laboratory. The entire sample was dried and crushed to 2mm and then split and a portion pulverised to 80% passing 10micron. The analysis was by fire assay with either atomic absorption finish or gravimetric determination. RC samples are split in the field to approximately 2.5Kg and then prepared and assayed in the same manner as for the diamond samples. Sludge samples were collected in 20L plastic buckets from 1.8m sample intervals and then transferred to poly-weave bags. These samples are prepared and assayed in the onsite and commercial laboratories using 3 acid digest and AAS finish. For the Nifty Heap Leach Pad 2014 and 2015 drilling 2 samples were collected for each 1m interval with between 1.5 and 3Kg of material collected via a cone splitter. The RC holes were 150mm diameter. The samples were sent to a commercial laboratory for preparation (drying, crushing, splitting and pulverising) with a 50gm sample analysed using after a 4 acid digest with an AAS finish. For the 2007 drilling a single sample (of up to 2.4Kg) collected for each hole (method unknown) with the sample assayed by size fraction using similar 4 acid digest techniques and the total copper reported as a weighted combination of the 3 size fraction values.

Drilling techniques	• *Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).*	The diamond core was of variable diameter with surface holes drilled using HQ and NQ whilst underground holes were mostly NQ sized core. Diamond drilling is mostly cored from collar and hole depths range to 1316.5m. The earlier core was not orientated however more recent holes are orientated using a spear. The method of drilling the RC holes at Nifty and Maroochydore is the use of a face sampling hammer in a 150mm diameter hole, these holes vary in length to 208m. Sludge sampled holes used a jumbo rig and vary in length to 121m. The Nifty Heap Leach Pad RC holes vary in length to 3m to 17m. The 2014 and 2015 holes were drilled using a face bit in a hole of 150mm diameter. No information is available for the 2007 drilling.
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.*	The core information is recorded in the database for some holes as recovered length and recovery is determined as recovered length/interval length. These measurements are made by the responsible geologist or field technician under supervision. The average core recovery is in excess of 93%.
		Blast holes were drilled using jumbo rigs with 1.8m rods, the sludge sample return is flushed into 20L buckets and then transferred into poly-weave bags. No documentation on the sample recovery for the RC holes.

	• *Measures taken to maximise sample recovery and ensure representative nature of the samples.*	Core recovery is extremely good and no additional measures are required to maximise recovery. The representative of the core in terms of copper grade is appropriate given the QAQC conducted and the mining history. At Nifty some calibration issues were noted with one of the laboratories. Sludge sample return is maximised by placement of the bucket. There is little other control on the sampling. There is no documentation on the sample collection/recovery for the RC holes.
	• *Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.*	Whilst no assessment has been conducted / reported the competency of the core as demonstrated by the high average recovery would tend to preclude any potential issue of sampling bias. Sludge sample Cu grades are adjusted by formulae based on test work. The lack of documentation on the sample recovery for the RC holes precludes any assessment.
Logging	• *Whether core and chip samples have been geologically and geotechnical logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.*	For core geological recording of lithology, mineralisation, veining, alteration, weathering, structure is appropriate to the style of the deposit. Sludge samples have lithological information recorded. Chip lithological logs are maintained for the RC samples.
	• *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography*	For core, geological logging is both in summary and detailed as for the information listed above and includes mineralisation type and content, some angle to core axis information, vein type, incidence and frequency, magnetic content. For sludge samples only lithology is recorded. For RC the logging is qualitative.

	• *The total length and percentage of the relevant intersections logged.*	The entire length of all diamond and RC holes, apart from surface casing and Nifty Heap Leach Pad holes, was logged.
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.*	Based on information provided and observed in photographs all core to be sampled was 1/2ed using a mechanical saw. It is not known if the core was consistently taken from one side of the stick.
	• *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.*	The entire sludge sample is dried, pulverised and split prior to analysis. RC samples are collected by either rotary splitter or riffling.
	• *For all sample types, the nature, quality and appropriateness of the sample preparation technique.*	Based on information relating to the previous companies and knowledge of the current owners the approach of using commercial laboratory facility for the preparation of samples is industry standard practice for this type of material with the copper mineral content demonstrated.
	• *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.*	Prior to Aditya Birla the inclusion of QAQC samples (standard and blanks) and the use of duplicates and re-submissions was not well documented and potentially fairly random. Aditya Birla has adopted industry best practice with respect to the numbers of standards and blanks inserted with the core the samples submitted however the use of non-certified blank material is discouraged. Aditya Birla also uses an umpire laboratory and field duplicates on occasions.
		Sludge sample QAQC is restricted to duplicates and repeats.

	• *Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.*	The QAQC results are on most occasions supportive of the copper grades however Aditya Birla does not regularly follow up the occasional apparent laboratory issues. Duplicate sampling when conducted is supportive of the original results. No 1/2nd half core duplicate assay results have been observed.
	• *Whether sample sizes are appropriate to the grain size of the material being sampled.*	The mineralisation style and the relatively low local grade variance combined with the domaining and supported by the QAQC validation provides confidence in the overall grade of the deposits being fairly represented in the estimates.
Quality of assay data and laboratory tests	• *The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.*	The assay techniques applied for the measurement of copper content is appropriate for the determination of the level of copper in the sample. The routine technique was aqua regia digest with ICPES analysis with over range values repeated using four acid digest with atomic absorption spectroscopy finish.
	• *For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.*	On occasions down hole EM is adopted to detect sulphide presence with some success.

	• *Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.*	Standards and Blanks have been included at rates varying from 1 in 20 to 1 in 40 relative to the number of routine samples for the recent diamond holes. The results were acceptable although occasional potential bias has been observed in Standards and there is evidence of potential sample preparation issues in a small number of blank samples. Neither of the issues is considered significant enough to negate the use of the impacted sample results. Umpire laboratory checking also provided support for the original results. For the recent Nifty Heap Leach Pad RC drilling a standard and a blank were included with each hole.
		Sludge sample duplicates and assay repeats give supportive results for the onsite laboratory.
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.*	High grade mineralisation in the core was observed and verified by Aditya Birla personnel and external consultants reviewed the intercepts compilation reported.
	• *The use of twinned holes.*	No specific twinning program has been conducted however in many positions within the Deposit drilling is in close proximity and the comparison of assay results is supportive

	• *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols*	Primary data was recorded directly onto electronic spread sheets and validated against code tables by the database manager.
	• *Discuss any adjustment to assay data.*	Sludge samples with assay results >2% Cu are adjusted by a graphical transform related to Cu content.
Location of data points	• *Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.*	The recent collar positions are surveyed by Aditya Birla or its contractors from known surface and underground datum. Documentation for previous drill holes indicates a similar methodology. The orientation and dip at the start of the hole was recorded and similar information is recorded down hole by single shot camera.
	• *Specification of the grid system used.*	For the Nifty Project the regional Grid is GDA94, Projection MGA Zone 51. All information is located on the Nifty Mine Grid which is a transformation and rotation based on local control point. 10000 is added to the AHD elevation. Maroochydore is located in the same regional grid as Nifty and a local grid converted from regional about local control with a 45° (approx) rotation is used for modelling
	• *Quality and adequacy of topographic control.*	Topographic control is taken from site surveys (aerial) and hole collar surveys and is adequate for the control required. Underground control is from known datums.

Data spacing and distribution	• *Data spacing for reporting of Exploration Results.*	Spacing varies by Deposits and position within the deposit. At Nifty the most concentrated drilling is on 40m spaced sections along strike with holes approximately 10 to 50m apart of section. Elsewhere spacing on varies to 80m. At Maroochydore the drilling is on sections between 100 and 200m apart along strike with holes on section between 10 and 50m apart near surface expanding to 200m apart at depth. For the Nifty Heap Leach Pad drill spacing varies with position with the 2007 holes (eastern 1/3 of the pad) drilled on a nominal 25mE x 50mN spacing; the 2014 holes (remainder of the pad) are drilled on a nominal 50m x 50m spacing. The 2015 drilling "in-filled" the 2007 drilling and was drilled on an irregular 100mE x 50mN pattern
	• *Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.*	Successive drilling programs have in filled the previous drilling and on the majority of occasions drilling has returned mineralisation in the expected locations. This provides a high degree of confidence in the geological continuity. Relatively close spaced drilling in many deposits provides good support for positioning of mineralisation. Successful mining at Nifty further enhances confidence in the geology interpretation.
	• *Whether sample compositing has been applied.*	Only occurs in those deposits with RC drilling and then is not regularly adopted.
Orientation of data in relation to geological structure	• *Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.*	The drilling is oriented as best as possible to perpendicular to the structure/geology containing or controlling the mineralisation. Drilling is in some locations down plunge/dip and the

		influence of this drilling is recognised in the estimation methodology.
	• *If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.*	No sampling bias is considered to have been introduced.
Sample security	• *The measures taken to ensure sample security.*	The chain of custody adopted by Aditya Birla is documentation based and the responsibility of the site geologist and the database manager. Each facet of the sample collection, site numbering and preparation and despatch to the laboratory is documented.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	Aditya Birla has standard operating procedures for drilling, sample collection, sample storage, data base management etc. It monitors and audits its own procedures.

Section 3 Estimation and Reporting of Mineral Resources		
Criteria	**Explanation**	**Comments**
Database integrity	• *Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes.*	The data utilised has been validated by the database manager by comparing laboratory result sheets and sample intervals on the drill logs to the contents of the database. Previous to this numerous external consultants have reviewed, compiled and validated the data also.
	• *Data validation procedures used.*	Utilises a SQL Server database and loads data with the contents checked against validation tables. The previous audit provided sufficient confidence in the database contents to state that it accurately represents the drill information.
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.*	The competent person regularly visits all of the sites. DataGeo has not visited any of the sites.
	• *If no site visits have been undertaken indicate why this is the case.*	Given the relationship between DataGeo and Aditya Birla (a cooperative approach to mineral estimation) no site visit is considered necessary for DataGeo.
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.*	The confidence in the geological interpretation is considered good as it is supported by the mining history and reconciliation (on some Deposits) and close spaced drilling providing adequate geological information. Any mineral domaining is generally constrained by well-known structural controls or within lithological conditions.
	• *Nature of the data used and of any assumptions made.*	Only physical data obtained in the field was utilised.

	• *The effect, if any, of alternative interpretations on Mineral Resource estimation.*	The application of hard boundaries to reflect the position of the deposits and domains within the deposits is supported by the field and drilling observations and if appropriate mining. The domaining of the high-grade is considered very important and requires ongoing assessment. No other interpretations are thought appropriate for the deposits.
	• *The use of geology in guiding and controlling Mineral Resource estimation.*	A Cu grade boundary of 0.2% to 0.3% appears to define statistically and geologically the margins of the mineralisation. The presence of structural controls and/or the positioning of appropriate rock types (for hosting mineralisation) provides the geological control and this combined with presence of copper is used to constrain the interpretation. The surveyed extents of the Heap Leach Pad were used as the constraints for the estimate of the Nifty Leach Pad.
	• *The factors affecting continuity both of grade and geology.*	At the Nifty Deposit the mineralisation is within 4 styles depending on position, oxide, transition, supergene and sulphide. All styles are defined by copper grade and/or mineral type plus position and lithology. In the sulphide style the higher-grade mineralisation is constrained in two well defined carbonate units within an overall well defined sedimentary sequence (total 8 units) which also carries mineralisation. The oxide, transition and supergene mineralisation is limited to the northern limb position within 300m of surface. At the Maroochydore Deposit the oxide, transition, fresh and sulphide mineralisation zones are defined by grade, mineral type and lithology. The position and style of mineral impacts the grade continuity.

Dimensions	• *The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource.*	At Nifty the sulphide strike length, measured along the hinge of the fold, is 1200m within the modelled area and extends further down plunge to the east. The Nifty sulphide sequence in both limbs of the fold is up to 1200m in length and extends to 500m below surface. The mineralised sequence is between 50 and 100m thick. The oxide, transition and supergene mineralisation occurs mostly near surface on the northern limb to a depth of up to 300m over a width of up to 100m. At Maroochydore the mineralisation is generally flat lying and extends over a strike length of 3000m, over a width of up to 600m and to a depth of 500m below surface. The Nifty Heap Leach pad occurs over an EW length of 1550m and has a maximum NS dimension of 400m. The maximum height of the pad is 20m.
Estimation and modelling techniques	• *The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used.*	At Nifty unfolding is applied and the grade is estimated from un-cut 1m composites using ordinary kriging into blocks representing the sulphide mineralisation subdivided into the 8 units in the mineralised sequence. Search ranges were varied by unit with up to 200m along strike, 100m across strike and up to 10m in the thickness of the unit. The orientation for variogram calculation was changed from the previous variography and aligned with the general mineralisation control in the unfolded space. Calculation and modelling of correlograms in planes that reflect the underlying geological and structural controls on the mineralisation. Varying parameters such as lag distance and angular tolerance to refine the structures. At Maroochydore the oxide, transition and fresh has been estimated using indicator kriging based on un-cut 1m composites with each zone estimated separately. The search strategy (distance and orientation) was based on geostatistical analysis. The sulphide mineralisation was estimated by ordinary kriging on uncut 1m composites. Grade estimation was carried out in either of the VulcanTM, Surpac or Datamine applications. The Nifty Heap Leach pad consists of excavated material with assumed

		construction parameters and that there is no continuity (either geological or grade) copper estimation was carried out in VulcanTM application using inverse distance to the power of 3 techniques to apply most weight to the closest composite data to the point being estimated. All holes were composited to 2m down hole regardless of position relative to the Pad. Density was assigned as a default based on six results from excavated pits. Estimated blocks were informed a three step strategy with orientation set to the assumed orientation of the construction of the pad. The initial (primary) search was 25mE x 25mN x 2mRL. This search range was expanded to 25mE x 50mN x 4mRL for blocks which were not informed in the primary search and to 50mE x 100mN x 10mRL for blocks not in formed in the first two searches. This strategy informed 70% of the blocks in the primary and secondary search. Any block not estimated was assigned a grade based on position as the average of the input data.
	• *The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.*	The Nifty mineral resource estimates has been the subject of numerous comparative estimates producing similar results. At Nifty the comparison to production data supports the estimate in a global sense. The oxide, transition and fresh estimate at Maroochydore has been subject of previous estimates by various parties on the same data giving similar results.
	• *The assumptions made regarding recovery of by-products.*	At Nifty there has been no assessment of any potential by-products. At Maroochydore whilst Co and Zn have been estimated their value has not been assessed.
	• *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).*	No assessment of deleterious elements has been made.

	• *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.*	At Nifty the block model was constructed using blocks which were 20mE (along strike) x 10mN (across strike) by 5m in the vertical plane. Sub-celling to 1/2 the block size in each direction was adopted to ensure accurate volume representation. At Maroochydore the block size for the oxide, transition, fresh and sulphide was 20mE x 50mN x 10mRL. Sub-celling to 1/2 the block size in each direction was adopted to ensure accurate volume representation. In all cases estimation was to the parent block size. The Nifty Heap Leach Pad block model was constructed using blocks sized at 25mE x 25mN x 2mRL with sub-celling to 1/2 the block size in each direction adopted to ensure accurate volume representation. Grade estimation was to the parent block size.
	• *Any assumptions behind modelling of selective mining units.*	not applicable
Estimation and modelling techniques (continued)	• *Any assumptions about correlation between variables.*	Whilst correlation between Cu and other elements has been undertaken for some Deposits the results do not influence the Cu estimation process.
	• *Description of how the geological interpretation was used to control the resource estimates.*	Hard boundaries where applied to the Domains within the Deposits. Grade was estimated within these boundaries.
	• *Discussion of basis for using or not using grade cutting or capping.*	Statistical analysis of the Cu composite data indicated that most domains within most Deposits had elevated coefficients of variation. The influence of outlier grades was either minimised using top-cuts with high-grade influence restricted by search for ordinary kriging or inverse distance estimation or the use of an estimation methodology which accommodated grade variability with orientation and range.
	• *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	Volume validation was carried out by comparison of the solids representing the mineralisation to the block model. Grade validation was carried by both global comparison of the average estimated grade

		to the average input grade and spatially by comparison of the estimated grades to the input grades by position. Also visual comparison was used. If appropriate production information was compared to modelled information (Nifty) with variable results.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	Density was determined by wet and dry measurements or calculated from Cu and Fe content. This information was then used to model/assign density either estimated using inverse distance methods, assigned using empirical methods based on Fe and Cu or using nearest neighbour methods. The tonnages estimated using density determined by copper content thus can be considered dry. The Nifty Heap leach Pad tonnage was estimated using a dry density default value based on six measurements from pit excavated samples using the Sand Cone method.
Cut-off parameters	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	For the Nifty Project a cut-off of 1.2% Cu is used for reporting that sulphide material with sufficient grade for economic underground mining by long hole open stoping methods. The use of 0.4% for oxide and transition is justified by studies and previous mining of this type of material. For the Maroochydore project the 0.5% Cu cut-off applied to the oxide, transition and fresh material describes that material from which open cut studies have identified economical outcomes by transporting and processing the material at Nifty. It is assumed that the Maroochydore sulphide will be mined and treated in a similar way with a higher reporting cut-off applied to identify material closer to the sulphide operating grade at Nifty. The Nifty Heap Leach Pad estimate is global and the application of a cut-off (0.5%) is considered appropriate to try to identify higher-grade material within the pad in a global sense. Additional “grade control” style information and/or reconciliation to the individual cells which comprise the pad would be used in assisting in selectivity and cut-off able to be supported.

Mining factors or assumptions	• *Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made.*	For the Nifty sulphide Deposit long hole open stoping has been successfully utilised for many years. 5.6 million tonnes at 2.58% Cu of Nifty Sulphide Resource has been depleted compared to the previously reported mineral resource estimate 31st March 2015, reflecting the impact of mineral resource losses resulting from sinkhole event. For the near surface oxide open pit studies have indicated its viability at the lower 0.4% cut-off. For the Maroochydore Project the reporting cut-off for open cut mining (oxide, transition and fresh material) of 0.5% is based on mining studies and ore transport to Nifty for processing. Similarly the sulphide material will be treated at Nifty and the higher cut-off is justified by average grade requirements. The Nifty Heap Leach pad material is crushed and stacked and thus easily available for re-claim. The assumption of 0.75% Cu being economic for processing relies on the assumption of supplementing the higher-grade material from the Nifty underground operation and yet to be determined process requirements which will determine the minimum economic grade. The estimate when compared to the production metal balance appears to be globally understated by up to 25% in grade and 15% in tonnage.
Metallurgical factors or assumptions	• *The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the metallurgical assumptions made.*	The Nifty mineralisation has been successfully treated for several years to produce copper in concentrate. An initial study on Maroochydore material indicates that a similar treatment to Nifty will be appropriate.

Environmental factors or assumptions	• *Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.*	At the Nifty Site the mining and processing is ongoing and it is planned to treat the Maroochydore Deposit at the Nifty facility.
Bulk density	• *Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples.*	For the Nifty Deposit a large number of determinations have been made based on copper content. For the Maroochydore Project no density information has been collected and values for modelling are taken from the Nifty deposit by material type.
	• *The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc), moisture and differences between rock and alteration zones within the deposit.*	The rocks within all Deposits do not display significant porosity thus the technique adopted is appropriate.
	• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	The material is generally fairly uniform as evidenced by the consistency in the specific gravity information.

Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.*	The classification is based on the quality and amount of input data, the grade continuity model, the physical domaining, the results of mining in some Deposits and drilling observation of the mineral system. The lacks of drilling QAQC for some of the data have been offset by the amount of drilling data with supportable assay information. Higher confidence areas have more supporting data (and in some case a mining history), areas of lower geological support reflect a lower classification.
	• *Whether appropriate account has been taken of all relevant factors (ie relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data).*	The input data particularly the more recent data is consistent and closely spaced enough to support the projection of the geological interpretation at depth and along strike/down plunge which in terms of style of mineralisation is consistent with other deposits within the same or similar geological setting. Later drilling programs have successfully in filled earlier programs in mineralised locations predicted by the initial program. The estimated grade correlates reasonably well with the input data given the nature of the mineralisation and to production information (particularly at Nifty)
	• *Whether the result appropriately reflects the Competent Person's view of the deposit.*	The Mineral Resource estimate reflects the Competent Persons understanding of the Deposit.
Audits or reviews.	• *The results of any audits or reviews of Mineral Resource estimates.*	Audits are routinely undertaken by external consultants.

Discussion of relative accuracy/ confidence	• *Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate.*	The mineral resource estimates are volume and sample constrained in well-defined geological locations and the confidence in the Mineral Resource is defined by the classification adopted as per the guidelines of the 2012 JORC code.
	• *The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.*	The statement relates to global estimates of tonnes and grade.
	• *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	At Nifty the comparison to production is good.