Diatreme Resources Limited
ABN: 33 061 267 061

ASX

ANNOUNCEMENT

ASX:DRX

CYCLONE ZIRCON PROJECT RESOURCE UPGRADE – WORLD CLASS ZIRCON DEPOSIT

Diatreme Resources Limited is an Australian based diversified mineral explorer with significant projects in WA and QLD.

The Board and senior personnel exhibit wide experience, ranging through the exploration, development and financing phases of resource project management.

Australian Securities Exchange Codes: DRX, DRXO

Board of Directors Non-executive:
William Wang - Chairman
Andrew Tsang
Daniel Zhuang

Executive:
Neil McIntyre – Chief Executive
Tuan Do – Chief Financial Officer
Ian Reudavey – Chief Geologist

Joint Company Secretaries:
Leni Stanley
Tuan Do

Key Projects:
• Cyclone Zircon Project
• Clermont Copper Project
• Cape Bedford Silica/HMS Project
• Tick Hill Gold Project

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9 April 2015

HIGHLIGHTS

- **Diatreme is pleased to announce a review and update of the Cyclone Project HM mineral resource estimate following the recent acquisition of the Cyclone Extended HM deposit from Image Resources.**
- **The Mineral Resource for Diatreme's flagship Cyclone Zircon Project is now estimated at 211 million tonnes (Mt) at 2.3% heavy minerals (HM) containing 4.8 Mt HM, increasing contained HM by 60%.**
- **The Zircon content of the HM is estimated at 27% (comprising 1.27 Mt of zircon in the mineral resource), an increase of 40% from previously reported estimates – confirming Cyclone's status as one of the highest zircon grade projects awaiting development.**
- **Approximately 75% of the resource tonnes and 80% of the HM tonnes are classified as Measured, with the remainder classified as Indicated.**
- **The estimate again highlights the low levels of slimes (-53um) at 4.2% and oversize (>2mm) at 4.9% within the Cyclone mineralisation. These characteristics are conducive to simple, low cost, mining, processing and tailing operations.**

Diatreme Resources Limited (ASX:DRX) has confirmed a significant expansion of the mineral resource at its flagship Cyclone Zircon Project, with the compilation of a resource estimate that incorporates data from the recently acquired Cyclone Extended deposit.

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CYCLONE DEPOSIT RESOURCE UPDATE

Discovered in 2007, the Cyclone Deposit is located along the Barton shoreline within the Wanna Lakes area of the northern Eucla Basin, 25 kilometres within Western Australia from the state border with South Australia and 220 kilometres north of the transcontinental railway.

Cyclone is interpreted as a Tertiary beach strandline HM system with analogies to Iluka's Jacinth/Ambrosia HM deposit in the eastern Eucla Basin. Mining of beach strandline deposits is well understood and has formed the basis of global mineral sands production to date.

Following completion of initial resource definition drilling by both Diatreme and Image in 2009, a substantial infill drilling program was conducted at Cyclone by Diatreme in several stages from late 2010 to mid-2012, and at Cyclone Extended by Image in mid-2011. Mineral Assemblage analysis was undertaken by Quantitative Evaluation of Minerals by Scanning Electron Microscopy ("QEMSCAN®").

The geological interpretation of the mineralisation includes 3 distinct geological domains;

- a "Beach" domain of well sorted marine and reworked dunal sands occurring as 2 broadly tapered elongate mineralised sand units originating from a common point and extending for over 7km
- a "Strand" domain of higher grade (>4%) HM mineralisation occurring as a series of continuous elongate strandline features within the broader "Beach" domain.
- A "Nearshore" domain of bimodal marine sands with fine grained HM mineralisation underlying the western beach unit and extending for over 8km as an arcuate feature.

Although these domains display some distinctive geological characteristics, they are expected to be extracted as a combined body of mineralisation.

The total resource estimate for Cyclone now stands at 211 Mt at 2.3% HM at 1% HM cut-off grade - refer Table 1 below:

TABLE 1: CYLONE RESOURCE ESTIMATE

Category	HM cut-off %	Material Mt	HM %	HM Mt	Slime %	OS %	Head Grade				Zircon Kt
							Zircon %	HiTi %	Alt Ilm %	Si TiOx %	
MEASURED	2.0	69	3.7	2.55	3.6	3.8	1.05	1.17	0.48	0.82	729
MEASURED	1.5	102	3.1	3.13	3.9	4.4	0.87	0.96	0.40	0.67	891
MEASURED	1.0	156	2.4	3.79	4.2	5.1	0.69	0.77	0.32	0.53	1,072
INDICATED	2.0	13	3.2	0.41	3.8	4.3	0.64	1.05	0.73	0.59	81
INDICATED	1.5	24	2.5	0.61	3.9	4.8	0.50	0.82	0.55	0.45	123
INDICATED	1.0	55	1.8	0.99	4.1	4.5	0.36	0.61	0.37	0.31	201
TOTAL	2.0	82	3.6	2.96	3.6	3.9	0.99	1.15	0.52	0.79	809
TOTAL	1.5	127	3.0	3.74	3.9	4.5	0.80	0.94	0.43	0.63	1,013
TOTAL	**1.0**	**211**	**2.3**	**4.78**	**4.2**	**4.9**	**0.60**	**0.72**	**0.34**	**0.47**	**1,273**
					Mineral Assemblage		**27%**	**32%**	**15%**	**21%**	

Table 1 & 2 Notes

- Rounding may generate differences in last decimal place
- A constant SG of 1.7 has been used to derive material tonnes
- Slime refers to material typically <53um
- OS refers to material typically >2mm
- Mineral Assemblage derived from QEMSCAN® analysis
- High Titanium Oxides (HiTi) – Ti-oxides containing 70 - 95% TiO_2, Altered Ilmenite (Alt Ilm) – Ti-oxides containing <70% TiO_2, Siliceous Ti-Oxide (Si TiOx) – Ti-oxides containing >10% silica rich Ti minerals.
- "Strand", "Beach" and "Nearshore" represent differing geological domains based upon varying sediment grain size and sorting (i.e. depositional environment), mineralogy and HM grade.

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TABLE 2: CYLONE RESOURCE ESTIMATE BY DOMAIN

Category	HM cut-off %	Material Mt	HM %	HM Mt	Slime %	OS %	Head Grade				Zircon Kt
							Zircon %	HiTi %	Alt Ilm %	Si TiOx %	
STRAND DOMAIN											
MEASURED	1.0	18	6.0	1.08	3.0	2.9	1.73	1.91	0.70	1.41	309
INDICATED	1.0	1	6.3	0.08	2.7	3.3	1.32	2.04	1.24	1.30	18
TOTAL	**1.0**	**19**	**6.0**	**1.16**	**3.0**	**2.9**	**1.70**	**1.92**	**0.74**	**1.41**	**327**
Mineral Assemblage							**28%**	**32%**	**12%**	**23%**	
BEACH DOMAIN											
MEASURED	1.0	110	2.1	2.27	4.3	4.7	0.57	0.64	0.32	0.43	625
INDICATED	1.0	35	1.8	0.65	4.4	3.7	0.34	0.58	0.49	0.30	119
TOTAL	**1.0**	**145**	**2.0**	**2.92**	**4.3**	**4.5**	**0.51**	**0.63**	**0.36**	**0.40**	**744**
Mineral Assemblage							**25%**	**31%**	**18%**	**20%**	
NEARSHORE DOMAIN											
MEASURED	1.0	28	1.6	0.44	4.6	7.9	0.49	0.52	0.10	0.34	138
INDICATED	1.0	19	1.3	0.25	3.6	5.9	0.34	0.55	0.07	0.25	64
TOTAL	**1.0**	**47**	**1.5**	**0.70**	**4.2**	**7.1**	**0.43**	**0.53**	**0.09**	**0.30**	**202**
Mineral Assemblage							**29%**	**36%**	**6%**	**20%**	

Figure 1 shows the outlines for the Cyclone HM resources and the drill hole collars, representative cross sections are presented as Figure 2. Technical details concerning the deposit, exploration drilling program and the resource estimation are presented in Appendix 1 (including JORC Table 1).

Note that previous ASX announcements relating to a combined resource for the Cyclone Project (DRX ASX Announcements 24 Mar 2015 and 11 Nov 2014) were based upon simple addition of the Diatreme Cyclone Mineral Resource (released 9 Jan 2014) and the Image Resources Cyclone Extended Mineral Resource (released 23 Jul 2010). The variance between the previously reported combined Cyclone resource (223 Mt at 2.1% HM) and this resource estimate (211 Mt at 2.3% HM) relates to:

- The use of practical modelling parameters based upon knowledge gained during feasibility studies of the Cyclone Project
- Inclusion of a significant amount of drill data for the Cyclone Extended deposit which was collected by Image Resources in Aug-Sep 2011 (i.e. post the published Cyclone Extended resource estimate)
- Use of an integrated database with no buffers/offsets for tenement boundaries

Neil McIntyre
CEO

Competent Person Statement

The information in this report, insofar as it relates to Mineral Resources is based on information compiled by Mr Ian Reudavey, who is a full time employee of Diatreme Resources Limited and a Member of the Australian Institute of Geoscientists. Mr Reudavey has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he has undertaken to qualify as a Competent Person as defined in the 2012 Edition of 'The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Reudavey consents to the inclusion in the report of the matters based on the information in the form and context in which it appears.

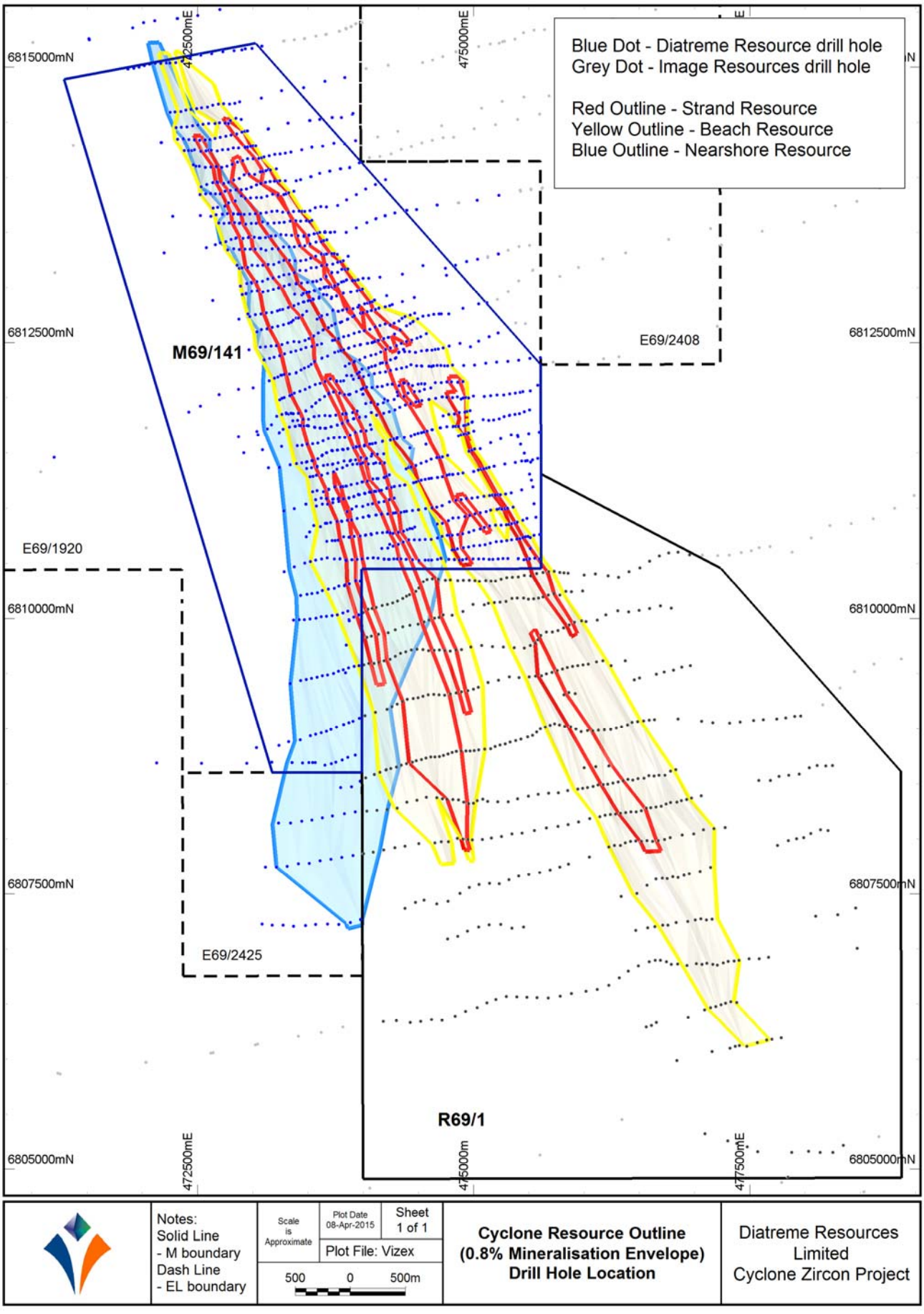

Figure 1a: Location Map Cyclone Resource

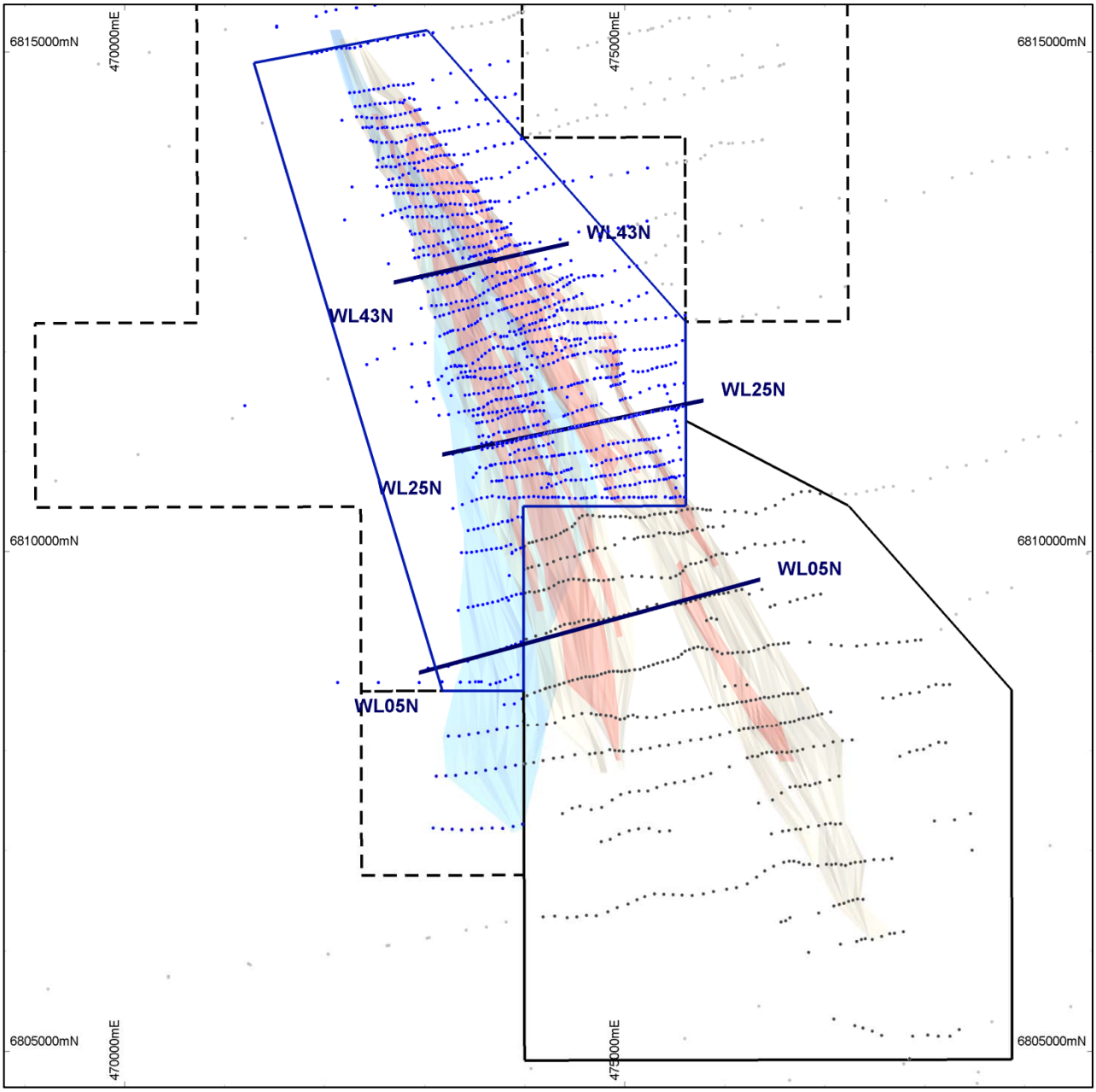

Figure 1b: Cross Sections Cyclone Resource

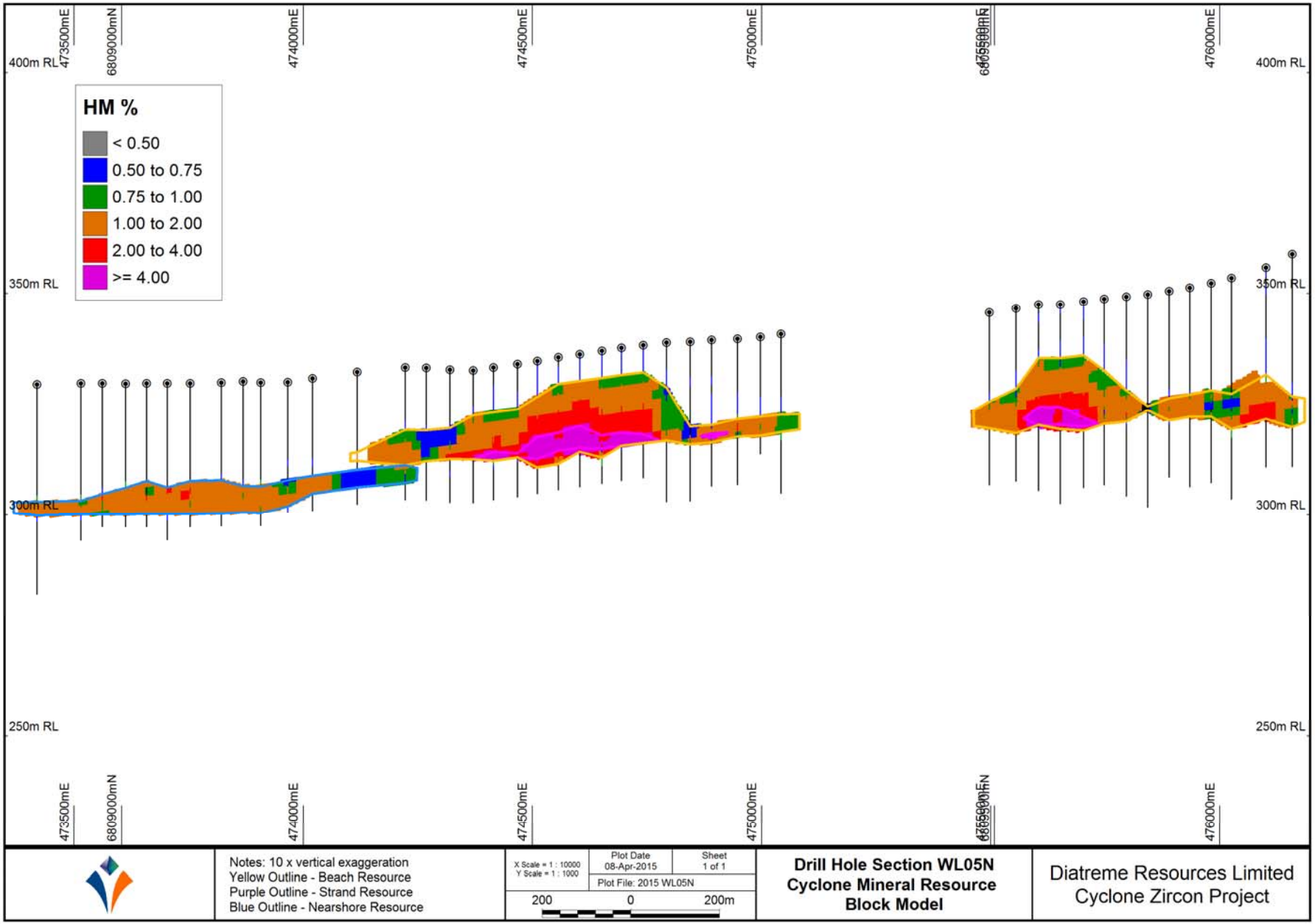

Figure 2a: WL05N Cross Section

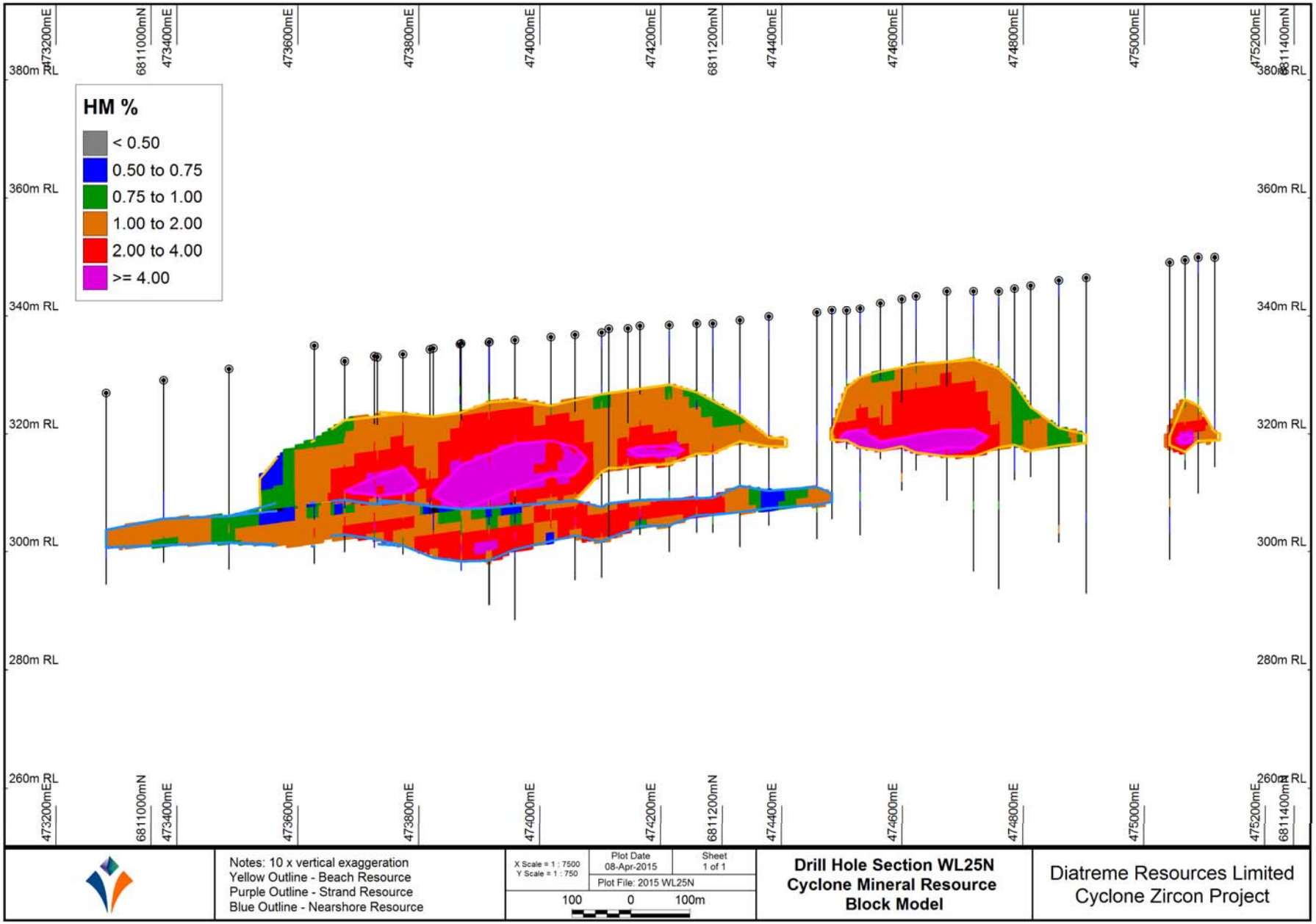

Figure 2b: WL25N Cross Section

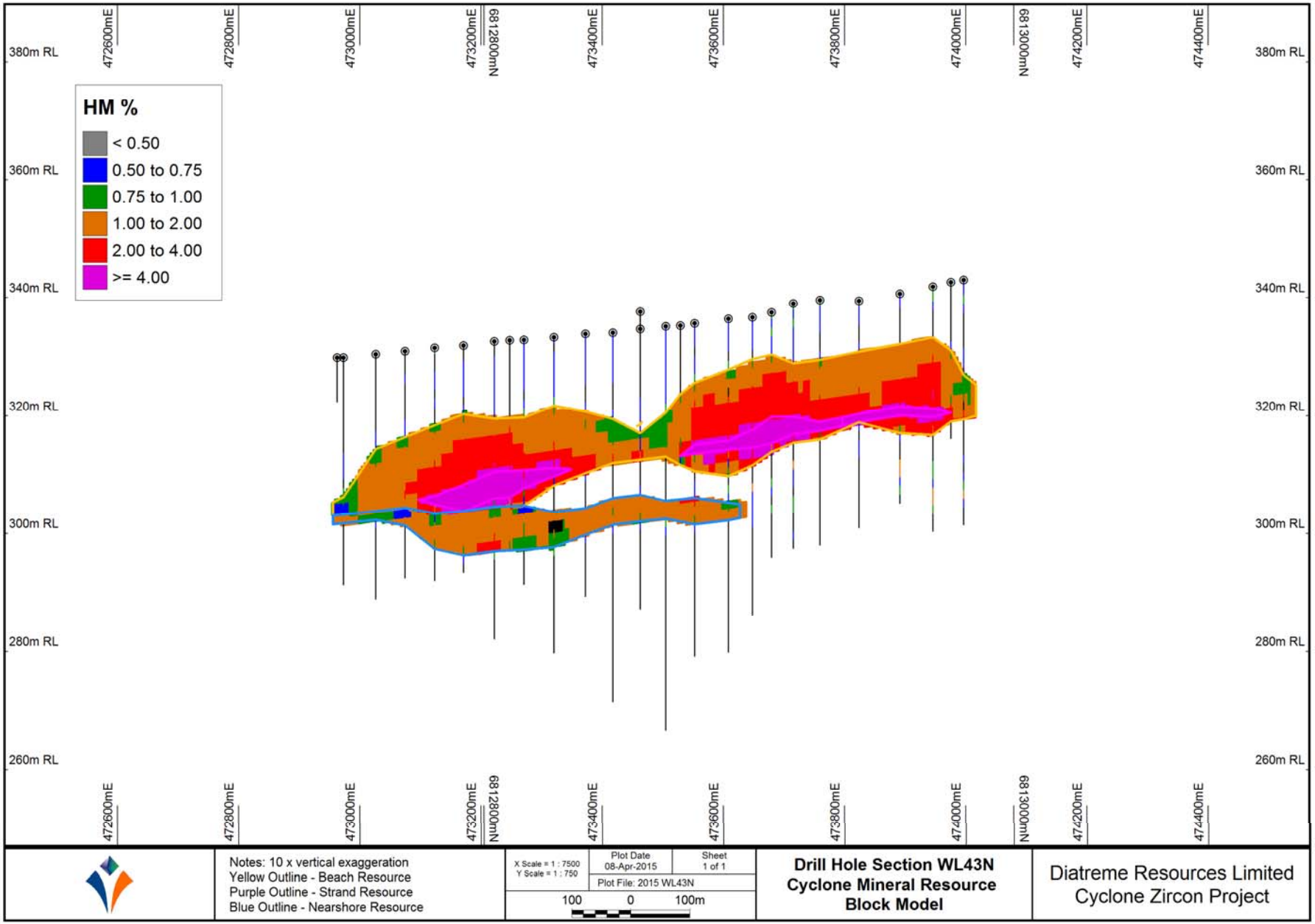

Figure 2c: WL43N Cross Section

APPENDIX 1 - Technical Details

Geology

The Cyclone Deposit is made up of a number of mineralised strand systems which represent Tertiary beach placer deposits with associated overlying dunal and underlying near shore deposits. The mineralised sands are free flowing with very little induration (rock) and low slimes contents which are favourable to traditional mining techniques. A thin Quaternary cover sequence of aeolian sands and loamy soils overlies the Tertiary sands.

Drilling Program

- All drilling has been completed using the NQ Air Core system of drilling.
- The Cyclone Deposit was discovered and broadly delineated by Diatreme Resources in mid-2007. A small program of re-drilling was carried out in September 2008 over the deposit which highlighted that much of the mineralisation was not recognised during the original drilling program and therefore a more thorough drilling and sampling program was organised and completed by July 2009. Infill drilling was carried out in Dec 2010, focussing on the proposed mine start-up area, Additional infill drilling was carried out in early 2011 in conjunction with drilling for bulk sample collection. Several small programs were completed in the second half of 2011 for infill and edge definition purposes, including southern extensions of the near shore resource. A final program of infill drilling was completed in mid-2012 for edge definition of strand mineralisation and further bulk sample collection.
- Following the discovery of Cyclone, Image Resources confirmed the continuation of mineralisation (i.e. Cyclone Extended) in to their adjoining tenure with three drilling programs subsequently completed. A reconnaissance drilling program in late 2008, a resource definition drilling program in mid-2009 and an infill and edge definition drilling program in mid-2011.
- A total of 2,152 holes for 87,715m of drilling have now been completed over the global Cyclone deposit with the resource estimate using 1,384 holes (1,094 by Diatreme and 290 by Image).
- The majority of the Cyclone deposit has been drilled at 50m hole spacing and drill lines are generally 150m apart with some lines spaced at 300-500m. The Cyclone Extended deposit has been drilled at 50m holes spacing with drill lines between 250m and 600m apart.
- The grade of heavy minerals for each sample was determined by heavy liquid analysis. Mineralogical assemblage determined by QEMSCAN® (with routine XRF confirmation) over selected sample composite intervals and incorporated in to the geological database.

Resource Estimation

- Geological and mineralisation domains have been interpreted from drill hole data using a nominal 0.8% HM mineralisation envelope. Solid wireframe models have been generated from these interpretations and used to control estimation into a resource block model using an Inverse Distance Cubed interpolation technique for HM, Slimes and Oversize, and Nearest Neighbour interpolation technique for mineralogy.
- The mineral resource has been reported using a 1.0% HM cut-off from this wireframe model.
- A specific gravity of 1.7 was applied to mineralised zone.
- The Cyclone Resource is up to 10.5km long and 2.0km wide. This resource estimate relates to mineralisation within both M69/141 and R69/1.
- Sectional interpretation shows good continuity both along and across the trend of the deposit.
- The resource is classified as Measured and Indicated based on the criteria set out in the "Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves" (JORC, 2012).

Note: The HM (Heavy Minerals) referred to in this report are all those minerals that have a density greater than 2.92 tonnes/cubic metre, as determined by heavy liquid separation. The amount of Valuable Heavy Mineral (VHM) such as Ilmenite, Rutile, Leucoxene and Zircon is determined by other methods (QEMSCAN®). The HM% values do not imply that all of the HM is VHM.

JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Criteria	JORC Code explanation	Commentary
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 hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.* • *Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.* • *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.*	• Sampling techniques are considered to be mineral sands "industry standard' for dry beach sands with low levels of induration and slime. • Samples are down hole intervals of air-core drill cuttings collected from cyclone mounted rotary splitter, approximately 2-3kg (representing ~20%) of drill material is sampled. • Diatreme samples are 1.5m intervals, Image samples are either 2m or 1m intervals, with visibly mineralised zones typically sampled at 1m intervals. • Sample representivity validated by twin drill holes, sample duplicate analysis and bulk sample testwork. • For Diatreme samples Heavy Mineral (HM) is defined as mineral grains within 53 to 710 µm size range with an SG greater than 2.9 • For Image samples Heavy Mineral (HM) is defined as mineral grains within 63 to 1,000 µm size range with an SG greater than 2.9
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).*	• Vertical NQ air-core drilling utilizing blade bit, 3m drill runs
Drill sample recovery	• *Method of recording and assessing core and chip sample recoveries and results assessed.* • *Measures taken to maximise sample recovery and ensure representative nature of the samples.* • *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.*	• Visual assessment and logging of sample recovery and sample quality • Reaming of hole and clearance of drill string after every 3m drill rod • Sample chute cleaned between samples and regular cleaning of cyclone to prevent sample contamination • No relationship is evident between sample recovery and grade
Logging	• *Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.* • *Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.* • *The total length and percentage of the relevant intersections logged.*	• Geological logging of the total hole by field geologist, with retention of sample in chip trays to allow subsequent re-interpretation of data • The total hole is logged; logging includes colour, grain size, sorting, induration and estimates of HM, slimes and oversize utilizing panning. • Logging is captured in Micromine data tables, with daily update of field database and regular update of master database.

Criteria	JORC Code explanation	Commentary
Sub-sampling techniques and sample preparation	• *If core, whether cut or sawn and whether quarter, half or all core taken.* • *If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.* • *For all sample types, the nature, quality and appropriateness of the sample preparation technique.* • *Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.* • *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.* • *Whether sample sizes are appropriate to the grain size of the material being sampled.*	• Rotary split on site (approx. 80:20), resulting in approximately 1.5 – 2.0kg of dry sample (as all mineralization occurs above the water table) • Diatreme sample is then dried, screened and washed to determine oversize and slimes content in company sample preparation facility. 100g sample for HLS (HM assay) is riffle split from homogenized screened and de-slimed sample • Diatreme duplicate HLS splits submitted at 1 in 40, results support sample representivity • Image sample is dried and a 100g split screened and washed to determine oversize and slimes content in contractor sample preparation facility. The remaining sand fraction is then submitted for HLS (HM assay) • Sample size is considered appropriate for the material sampled • Mineralogy samples are typically down hole composites of HM from the mineralized zone(s) with multiple hole composites across section for some of the thinner mineralized zones
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.* • *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.* • *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.*	• Diatreme sample preparation laboratory operated by subsidiary company with methods and procedures adopted from industry standards • Diatreme HM analysis undertaken by recognised independent HM laboratory (Diamantina Labs) utilizing TBE • Image sample preparation and analysis undertaken by recognised independent HM laboratory (Western Geolabs) • Duplicates and external laboratory checks regularly undertaken for HM analysis, acceptable levels of accuracy and precision have been established • Mineralogy of the HM fraction determined by QEMScan analysis. • Valuable heavy minerals reported are Zircon, HiTi (Ti-oxides 70 – 95% TiO_2), Altered Ilmenite (Ti-oxides <70% TiO_2) and Si TiOx (siliceous Ti-oxides containing >10% silica rich Ti minerals) • Potentially deleterious minerals are also assayed (e.g. andalusite) as well as proportions of clean, coated and composite grains
Verification of sampling and assaying	• *The verification of significant intersections by either independent or alternative company personnel.* • *The use of twinned holes.* • *Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.* • *Discuss any adjustment to assay data.*	• Significant intersections validated against geological logging and local geology / geological model. • Significant intersections verified by company personnel. • Selected significant intersections independently validated as part of due diligence exercise by BaoTi in 2011. • A number of twinned holes occur across the deposit and these have verified the sampling and assaying results. • All data captured and stored in electronic format, with compilation and storage completed by external contractors.
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*	• All holes initially located using handheld GPS with an accuracy of 5m • Subsequent DGPS survey of drill hole collars, accurate to within 1m in X and Y

Criteria	JORC Code explanation	Commentary
	used in Mineral Resource estimation. • *Specification of the grid system used.* • *Quality and adequacy of topographic control.*	as survey was often taken of rehabilitated drill site (i.e. estimated collar location) • UTM coordinates, Zone 52, GDA94 datum. • Topographic surface generated from processing Ikonos satellite imagery and DGPS control points, collar RL's levelled against this surface to ensure consistency in the database and with the block model.
Data spacing and distribution	• *Data spacing for reporting of Exploration Results.* • *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.* • *Whether sample compositing has been applied.*	• Diatreme drill lines established at 150m to 300m spacing in interdunal swales with holes 50m apart in the beach mineralisation, 50-100m apart in the areas of nearshore only mineralisation and 25-50m apart in the narrower higher grade strand mineralisation. • Image drill lines established at 250m to 500m spacing in interdunal swales with holes 50m apart in the main body of mineralisation and 50-100m apart on the marginal areas of mineralisation. • Drill spacing and distribution is sufficient to allow valid interpretation of geological and grade continuity appropriate to the estimation procedure and classification applied. • Sample compositing (down hole and occasionally across / along section) has been undertaken for determination of mineralogy.
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.* • *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.*	• The mineralisation displays an average strike around 340°, whereas the overlying Quaternary dune field has dune ridges dominantly trending 80° - 260°. Exploration data is therefore well orientated to sample the mineralised feature without bias.
Sample security	• *The measures taken to ensure sample security.*	• Sample collection and transport from the field undertaken by company personnel following company procedures. • Diatreme HLS samples dispatched to laboratory in secure packaging via Australia Post.
Audits or reviews	• *The results of any audits or reviews of sampling techniques and data.*	• A prospective JV partner (BaoTi) undertook a geological due diligence exercise in 2011 with positive results. • A number of experienced mineral sands geologists have been involved in generation of the exploration methods, procedures and geological database.

Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	• *Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.* • *The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.*	• The Cyclone deposit occurs within adjoining tenements M69/141, R69/1 and E 69/2425 in Western Australia. M69/1 and E69/2425 are held by Lost Sands Pty Ltd, a wholly owned subsidiary of Diatreme Resources, and R69/1 is held by Diatreme Resources. • The tenements are in good standing • A Project Agreement is in place with the native title party (Pila Ngaru)
Exploration done by other parties	• *Acknowledgment and appraisal of exploration by other parties.*	• Exploration within R69/1 has been undertaken by Image Resource, although exchange of data was established under a MoU in September 2010. • The general drilling, sampling and assaying techniques utilised by Image are consistent with those utilised by Diatreme, and as such the data is considered to be of similar quality to that generated by Diatreme. • Diatreme acquired all data for R69/1 with the tenement purchase in Mar 2015
Geology	• *Deposit type, geological setting and style of mineralisation.*	• The Cyclone mineral resource comprises a number of stacked and re-worked beach strandline mineral sand deposits associated with a Tertiary age coastal shoreline feature. • Mineralisation occurs within bimodal near-shore sands, beach / surf zone strandlines, homogenous beach sands, and overlying aeolian dune sands. • Quaternary cover overlies the deposit, and a shallow weathering profile with calcrete and ferruginous induration has developed.
Drill hole Information	• *A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:* o *easting and northing of the drill hole collar* o *elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar* o *dip and azimuth of the hole* o *down hole length and interception depth* o *hole length.* • *If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.*	• The Cyclone mineral resource has been estimated using data from 1,384 drill holes and it is not considered appropriate to tabulate each drill hole • Representative cross sections along the strike of the mineralization to illustrate some of the drill data and the nature of the mineralisation were attached to previous announcements (Jan 23 2012 and Jan 09 2014). • Representative cross sections showing drill holes and block model data are attached to this corresponding announcement.
Data aggregation methods	• *In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.*	• Image drill data was composited to 1.5m intervals within corresponding geological domains for the purpose of resource estimation.

Criteria	JORC Code explanation	Commentary
	• *Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.* • *The assumptions used for any reporting of metal equivalent values should be clearly stated.*	
Relationship between mineralisation widths and intercept lengths	• *These relationships are particularly important in the reporting of Exploration Results.* • *If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.* • *If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').*	• As the mineralization is associated with in-situ coastal marine sands it is essentially horizontal, with a maximum slope of 1°. • All drilling is vertical, hence the drill intersection is essentially equivalent to the true width of mineralisation.
Diagrams	• *Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.*	• A map of the drill collar locations is incorporated with the main body of the announcement, and representative cross-sections are attached.
Balanced reporting	• *Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.*	• Not applicable, resource estimate considers all material within the mineralisation domains. • Resource estimate is presented using variable cut-off grade and by geological domain to allow an understanding of grade distribution.
Other substantive exploration data	• *Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.*	• Geological observations consistent with beach placer / strand mineralisation • Several bulk samples (up to 12t) and subsequent metallurgical tests have characterized the nature of the mineralisation and confirmed that conventional processing techniques can be applied to produce marketable products. Some HM is coated and acid leaching +/- attritioning may be required for efficient separation / processing • No bulk density measurements have been undertaken • No groundwater was intersected in the course of drilling • A Quaternary weathering profile including calcrete and rubbly laterite has developed above and within the upper part of the mineralisation. Minor cementing and silicification of the mineralised sand can occur, but the mineralisation is dominantly (>95%) unconsolidated sand • Siliceous coatings and intergrowths on some HM grains are the only known deleterious substances. U+Th levels are <500pm for zircon product
Further work	• *The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).* • *Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.*	• Not applicable, project is proceeding to feasibility study based on comprehensive exploration program completed to date. • The limits of mineralisation have been established by the comprehensive exploration program completed to date.

Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

Criteria	JORC Code explanation	Commentary
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.* • *Data validation procedures used.*	• Drill data logged electronically in the field, manual and automatic validation undertaken prior to loading in to master database • The master database is managed by external consultants • General database validation using Micromine prior to resource estimation • Detailed database validation by manual/visual checking using Micromine
Site visits	• *Comment on any site visits undertaken by the Competent Person and the outcome of those visits.* • *If no site visits have been undertaken indicate why this is the case.*	• Competent Person has undertaken several site visits and supervised numerous exploration drilling campaigns and is familiar with the terrain, mineralization and geological characteristics of the deposit
Geological interpretation	• *Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.* • *Nature of the data used and of any assumptions made.* • *The effect, if any, of alternative interpretations on Mineral Resource estimation.* • *The use of geology in guiding and controlling Mineral Resource estimation.* • *The factors affecting continuity both of grade and geology.*	• A general geological model for mineralisation has been developed based on exploration data and published models for beach placer development, with minor modification to accommodate locally observed features. This allows high confidence in the geological interpretation of the Cyclone deposit • The data is of sufficient density that alternative interpretations will not materially affect the Mineral Resource estimate. • The deposit has been split in to three domains, based upon geology and HM grade, for the purposes of resource estimation. • The 'Beach' domain comprises beach sands and minor dune and reworked beach sands, and typically displays transitional upper and lateral boundaries, with a distinct basal contact associated with surf zone grit and gravel. • The 'Strand' domain comprises beach strandline mineralization and typically displays transitional upper and seaward lateral boundaries with a sharp basal contact associated with surf zone grit and gravel, it occurs wholly within the Beach domain (i.e. a subset of the' Beach' domain). • The 'Nearshore' domain comprises bi-modal fine grained marine sands with grit and typically displays transitional contacts. • A nominal 4% HM grade was used to delineate the Strand domain, with lower grade material occasionally included to maintain continuity and smooth shape. • A nominal 0.8% HM grade was used to delineate the Beach and Nearshore domain boundaries, with lower grade material sometimes included to maintain geological continuity and a smooth geometry. • The use of pure geological domains would result in a much larger, but lower grade, mineral resource estimate for Cyclone due to the transitional grade boundaries • Grade continuity is significantly shorter across strike than along strike due to factors relating to deposition and sorting of material in a beach environment

Criteria	JORC Code explanation	Commentary
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.*	• The Beach domain has two primary 'arms' with a strike of around 7.0 and 9.5 km, a width of up to 0.8 km, with the top of ore reaching to 6m below ground surface, and the base of mineralisation typically between 24 to 30m below ground surface. • The Strand domain forms a higher grade core of the Beach domain, with 6 individual strands recognized. Strands range from 2.5 to 7km in length, from 50 to 400m in width, and 2 to 12m in thickness • The Nearshore domain has a strike of 7.5 km, a width up to 1.1 km, but is typically only 4 – 6m thick. It often abuts the base of the Beach domain, but can be separated by up to 8m of low grade material, or occur without the presence of overlying beach mineralisation
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.* • *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 assumptions made regarding recovery of by-products.* • *Estimation of deleterious elements or other non-grade variables of economic significance (eg sulphur for acid mine drainage characterisation).* • *In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.* • *Any assumptions behind modelling of selective mining units.* • *Any assumptions about correlation between variables.* • *Description of how the geological interpretation was used to control the resource estimates.* • *Discussion of basis for using or not using grade cutting or capping.* • *The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.*	• Resource estimation was undertaken using Micromine software, with inverse distance cubed interpolation method used for HM, Slimes and Oversize, and Nearest Neighbour for mineral assemblage. Mineral tonnes are calculated for each block, then total mineral assemblage calculated i.e. mineral assemblage values applied locally (weighted) and not as an unweighted global average • Parent blocks size of 50m x 20m x 2m with 5 x 4 x 4 sub-blocking to neatly fit wireframes • Three domains (as discussed above) were modelled separately and then combined to form a single block model for reporting purposes • A minimum 3m thickness was applied to domain shapes, as this represents a minimum selective mining thickness • A primary search ellipse of 275m x 55m x 5m oriented at 340° with a 0.8° dip to the west was used, minimum 3 samples and maximum 16 samples • The resource estimate shows good correlation with previous estimates and also with wireframe volumes and raw drill assay data • No top cut was applied as the high grade assays are believed to be a true sample of the grade of well-developed continuous beach strandlines • The domain boundaries do not extend beyond halfway to the adjoining drill hole or drill line • The block model was validated visually and statistically against drillhole data. • A hard boundary between the 'Beach' and 'Strand' domains was used to estimate grades for the Strand Domain, to prevent excessive dilution and smoothing of what is interpreted as a distinct high grade strandline. • A soft boundary between the 'Beach' and 'Strand' domains was used to estimate grades for the 'Beach' Domain, to reflect the transitional upper and seaward contacts of the strandline mineralisation.
Moisture	• *Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.*	• Tonnages are estimated on a dry basis.
Cut-off	• *The basis of the adopted cut-off grade(s) or quality parameters applied.*	• A 1% HM cut-off grade was utilized for reporting of the resource as this is

Criteria	JORC Code explanation	Commentary
parameters		believed to represent an appropriate grade considering the mineral assemblage, proposed mining technique and project economics.
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.*	• Conventional open pit 'dry' mining for mineral sands, with overburden removal by truck and shovel, and ore mining utilising in-pit dozer traps and slurry pumping. A minimum mining dimension of 100m width and 3m thickness is considered practical • As the resource estimate has been generated and utilised for feasibility studies the mining assumptions are considered to be rigorous.
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.*	• Several programs of metallurgical testwork and process flow development have been undertaken by Mineral Technologies (MT) • Conventional wet concentrator plant for mineral sands, primarily utilising spiral separation with secondary screening and classification to achieve high HMC quality • Testwork indicates >90% recovery of zircon to HMC, the primary economic driver of the resource • Conventional mineral separation plant, primarily utilizing magnetic and electrostatic separation with secondary screening, classification and gravity separation to achieve mineral products • As the resource estimate has been utilised for feasibility studies the metallurgical assumptions are considered to be rigorous
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.*	• The Cyclone project occurs within a vast vegetated dune field of the Great Victoria Desert in a remote location and does not display any unique environmental characteristics • Environmental management practices similar to those currently used in the mineral sands industry, but modified for the local environment, will be applied • Tailings will initially be disposed of in purpose built facilities, before reverting to in-pit tailings backfill
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.* • *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.*	• Assumed bulk density of 1.7 utilised for tonnage estimates, based on both the theoretical density of mature sand deposits with relatively low levels of slime and HM, and similar HM deposits in Australia. • The mineralised material is reasonably homogenous over the extent of the resource and there is not expected to be material changes in the bulk density throughout the resource.

Criteria	JORC Code explanation	Commentary
	• *Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.*	
Classification	• *The basis for the classification of the Mineral Resources into varying confidence categories.* • *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).* • *Whether the result appropriately reflects the Competent Person's view of the deposit.*	• The primary factor for resource classification is drill spacing i.e. HM assay data density, as the geological setting and style of mineralisation is well understood and relatively consistent. • Infill drilling during 2011 and 2012 confirmed HM grade continuity and allowed higher confidence in the current drill pattern. • Additional mineral assemblage data is required to achieve similar levels of confidence and continuity as for HM data. • The classification used reflects the Competent Persons understanding of the deposit.
Audits or reviews	• *The results of any audits or reviews of Mineral Resource estimates.*	• The 2015 Mineral Resource estimate has utilised a similar approach to the 2010 estimate which was undertaken by an independent technical expert.
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 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.* • *These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.*	• A high level of confidence is placed on tonnage estimates (for the stated cut-off grade) as the geometry of mineralisation is well understood and the bulk density is considered accurate. • A high level of confidence is placed on HM grade estimates, due to the data density, sample analysis techniques and methods of estimation. However, there is some evidence from bulk sampling that HM grade may be under-estimated by drilling / modelling, but this is not unusual for air-core drilling of unconsolidated sand deposits. Further investigations will be undertaken. • A high level of confidence is placed on slimes grade estimates, due to the data density, sample analysis techniques and methods of estimation. • A moderate level of confidence is placed on oversize grade estimates, due to the use of mechanised drilling techniques which can grind/pulverise indurated material and hence lead to under-estimation of oversize. Induration can also occur in an irregular manner and therefore be difficult to quantify by drilling alone. • A high to moderate level of confidence is placed on the global mineral assemblage estimate, as there is a reasonable number of QEMScan assays of composite samples from across the full extent of the deposit and the grade interpolation method accounts for variation through the deposit • A moderate level of confidence is placed on the local mineral assemblage estimates, as the use of composites may mask short range changes in mineral assemblage vertically through the mineralisation. Similarly, there exist some significant lateral variations in mineral assemblage, and the current data density is not sufficient to accurately define the boundary of mineral assemblage domains