

**Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves**

**(The JORC Code)**



**Prepared by the Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and Minerals Council of Australia (JORC)**

**Comparison JORC (2004) to JORC (2012) Draft Code**

The JORC (2004) code is presented here in side by side format with the equivalent clauses of the draft JORC ( 2012) code

Areas of text substantially edited in the JORC 2012 code are coloured green for easier identification

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<p><b>Foreword</b></p> <p>1. The <i>Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves</i> (the 'JORC Code' or 'the Code') sets out minimum standards, recommendations and guidelines for Public Reporting in Australasia of Exploration Results, Mineral Resources and Ore Reserves. The Joint Ore Reserves Committee ('JORC') was established in 1971 and published several reports containing recommendations on the classification and Public Reporting of Ore Reserves prior to the release of the first edition of the JORC Code in 1989.</p> <p>Revised and updated editions of the Code were issued in 1992, 1996 and 1999. This 2004 edition supersedes all previous editions.</p> <p>Concurrently with the evolution of the JORC Code, the Combined Reserves International Reporting Standards Committee ('CRIRSCO'), initially a committee of the Council of Mining and Metallurgical Institutions ('CMMI'), has, since 1994, been working to create a set of standard international definitions for reporting Mineral Resources and Mineral (Ore) Reserves, modelled on those of the JORC Code.</p> <p>Representatives of bodies from participating countries (Australia, Canada, South Africa, USA and UK) reached provisional agreement on standard definitions for reporting in</p>	<p><b>Foreword</b></p> <p>1. The <i>Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves</i> (the 'JORC Code' or 'the Code') sets out minimum standards, recommendations and guidelines for Public Reporting in Australasia of Exploration Results, Mineral Resources and Ore Reserves. The Joint Ore Reserves Committee ('JORC') was established in 1971 and published several reports containing recommendations on the classification and Public Reporting of Ore Reserves prior to the release of the first edition of the JORC Code in 1989.</p> <p>Revised and updated editions of the Code were issued in 1992, 1996 and 1999, and 2004. This 2012 edition supersedes all previous editions.</p> <p>Concurrently with the evolution of the JORC Code, the Committee for Mineral Reserves International Reporting Standards ('CRIRSCO'), initially a committee of the Council of Mining and Metallurgical Institutions ('CMMI'), has, since 1994, been working to create a set of standard international definitions for reporting Mineral Resources and Mineral (Ore) Reserves, modelled on those of the JORC Code.</p> <p>Representatives of bodies from Australia, Canada, South Africa, USA and the UK reached provisional agreement on standard definitions for reporting in 1997. This was followed in 1998 by an agreement to</p>
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1997. This was followed in 1998 by an agreement to incorporate the CMMI definitions into the International Framework Classification for Reserves and Resources – Solid Fuels and Mineral Commodities, developed by the United Nations Economic Commission for Europe ('UN-ECE').

As a result of the CRISCO/CMMI initiative, considerable progress has been made towards widespread adoption of consistent reporting standards throughout the world. These are embodied in the similar codes, guidelines and standards published and adopted by the relevant professional bodies in Australia, Canada, South Africa, USA, UK, Ireland and many countries in Europe. The definitions in this edition of the JORC Code are either identical to, or not materially different from, those international definitions.

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In 2002 CMMI was disbanded but CRIRSCO survived as a separate entity and now has a relationship with the International Council on Mining and Metals. An initiative was commenced to develop a Template, largely based on the JORC Code, that was designed to assist countries to develop their own Code, which would be consistent with world best practice. The Template has been recognised as a commodity-specific Code in UNFC 2009.

CRIRSCO's members are National Reporting Organisations (NROs) that are responsible for developing mineral reporting codes, standards and guidelines in Australasia (JORC), Chile (National Committee), Canada (CIM), Europe (PERC), Russia (NAEN), South Africa (SAMREC) and the USA (SME). As a result of the CRIRSCO/CMMI initiative, considerable progress has been made towards widespread adoption of consistent reporting standards throughout the world. Defined terms in this edition of the JORC Code are aligned to the CRIRSCO Standard Definitions published in December 2011.

**Introduction**

2. In this edition of the JORC Code, important terms and their definitions are highlighted in **bold** text. The guidelines are placed after the respective Code clauses using *indented italics*. They are intended to provide assistance and guidance to readers. They do not form part of the Code, but should be considered persuasive when interpreting the Code. Indented italics are also used for Appendix 1 – ‘*Generic Terms and Equivalents*’, and Table 1 – ‘*Check List of Assessment and Reporting Criteria*’ to make it clear that they are also part of the guidelines, and that the latter is not mandatory for reporting purposes.
  
3. The Code has been adopted by The Australasian Institute of Mining and Metallurgy (‘The AusIMM’) and the Australian Institute of Geoscientists (‘AIG’) and is therefore binding on members of those organisations. It is endorsed by the Minerals Council of Australia, and the Securities Institute of Australia as a contribution to good practice. The Code has also been adopted by and included in the listing rules of the Australian (‘ASX’) and New Zealand (‘NZX’) Stock Exchanges.

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*The ASX and NZX have, since 1989 and 1992 respectively, incorporated the Code into their listing rules. Under these listing rules, a Public Report must be prepared in accordance*

*accordance with the Code if it includes a statement on Exploration Results, Mineral Resources or Ore Reserves. The incorporation of the Code imposes certain specific requirements on mining or exploration companies reporting to the ASX and NZX. The 2004 edition of the Code has included much of the relevant material previously found only in the listing rules concerning the reporting of Exploration Results and the naming of the Competent Person. Despite the inclusion of this material in the Code it is strongly recommended that users of the Code familiarise themselves with those listing rules which relate to Public Reporting of Exploration Results, Mineral Resources and Ore Reserves.*

*The JORC Code requires the Competent Person(s), on whose work the Public Report of Exploration Results, Mineral Resources or Ore Reserves is based, to be named in the report. The report or attached statement must say that the person consents to the inclusion in the report of the matters based on their information in the form and context in which it appears, and must include the name of the person's firm or employer. Refer to Clause 8 of the Code.*

*with the Code if it includes a statement on Exploration Results, Mineral Resources or Ore Reserves. The incorporation of the Code imposes certain specific requirements on mining or exploration companies reporting to the ASX and NZX. There remain number of other issues outside of the JORC Code associated with Public Reports that are addressed specifically within the listing rules. As such, it is strongly recommended that users of the Code familiarise themselves with the listing rules of the relevant exchange which relate to Public Reporting of Exploration Results, Mineral Resources and Ore Reserves.*

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<p><b>Scope</b></p> <p>4. The main principles governing the operation and application of the JORC Code are transparency, materiality and competence.</p> <ul style="list-style-type: none"> <li>• <b>Transparency</b> requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and is not misled.</li> <li>• <b>Materiality</b> requires that a Public Report contains all the relevant information which investors and their professional advisers would reasonably require, and reasonably expect to find in the report, for the purpose of making a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Ore Reserves being reported.</li> <li>• <b>Competence</b> requires that the Public Report be based on work that is the responsibility of suitably qualified and experienced persons who are subject to an enforceable professional code of ethics.</li> </ul>	<p><b>Scope</b></p> <p>4 The main principles governing the operation and application of the JORC Code are Transparency, Materiality and Competence.</p> <ul style="list-style-type: none"> <li>• <b>Transparency</b> requires that the reader of a Public Report is provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and is not misled, either intentionally or by omission of Material information that is known to the Competent Person.</li> <li>• <b>Materiality</b> requires that a Public Report contains all the relevant information which investors and their professional advisers would reasonably require, and reasonably expect to find in the report, for the purpose of making a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Ore Reserves being reported. Where relevant information is not supplied an explanation must be provided to explain its exclusion.</li> <li>• <b>Competence</b> requires that the Public Report be based on work that is the responsibility of suitably qualified and experienced persons who are subject to an enforceable professional code of ethics.</li> </ul> <p>Transparency and Materiality are guiding principles of the Code, and the Competent Person must provide explanatory commentary on the Material assumptions underlying the declaration of Exploration Results, Mineral Resources or Ore</p>
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<p>5. <b>Reference in the Code to a Public Report or Public Reporting is to a report or reporting on Exploration Results, Mineral Resources or Ore Reserves, prepared for the purpose of informing investors or potential investors and their advisers. This includes a report or reporting to satisfy regulatory</b></p>	<p>Reserves.</p> <p>In particular, they must consider that the benchmark of Materiality is that which an investor or their advisors would reasonably expect to see explicit comment on from the Competent Person. The Competent Person must not remain silent on any issue for which the presence or absence of comment could impact the public perception or value of the mineral occurrence.</p> <p>Table 1 criteria provide a useful checklist of criteria to be considered by the Competent Person in developing their documentation and in preparation of the public report.</p> <p>In the context of complying with the principles of the Code, comment on Table 1 must be provided on an ‘if not why not’ basis within the Competent Person’s documentation and additionally within public reporting for significant projects when reporting Exploration Results, Mineral Resources or Ore Reserves for the first time or that have materially changed from when those were last reported. This is to ensure that it is clear to the investor whether items have been considered and deemed of low consequence or are as yet not addressed or resolved.</p> <p><b>5 Public Reports are reports, prepared for the purpose of informing investors or potential investors and their advisers on Exploration Results, Mineral Resources or Ore Reserves. They include, but are not limited to annual and quarterly company reports, press releases, information memoranda,</b></p>
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**requirements.**

*The Code is a required minimum standard for Public Reporting. JORC also recommends its adoption as a minimum standard for other reporting. Companies are encouraged to provide information in their Public Reports which is as comprehensive as possible.*

*Public Reports include but are not limited to: company annual reports, quarterly reports and other reports to Australian and New Zealand Stock Exchanges, or as required by law. The Code applies to other publicly released company information in the form of postings on company web sites and briefings for shareholders, stockbrokers and investment analysts. The Code also applies to the following reports if they have been prepared for the purposes described in Clause 5: environmental statements; Information Memoranda; Expert Reports, and technical papers referring to Exploration Results, Mineral Resources or Ore Reserves.*

**technical papers, website postings and public presentations.**

These Public Reports may be to the Australian Securities Exchange and the New Zealand Stock Exchange, or other regulatory authorities or as required by law.

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*For companies issuing concise annual reports, inclusion of all material information relating to Exploration Results, Mineral Resources and Ore Reserves is recommended. In cases where summary information is presented it should be*

*For companies issuing concise annual reports, or other summary reports, inclusion of all material information relating to Exploration Results, Mineral Resources and Ore Reserves is recommended. In cases where summary information is presented it should be clearly stated that it is a summary, and a reference attached giving the location of the Code-compliant Public Reports or Public Reporting on which the summary is based.*

*It is recognised that companies can be required to issue reports into more than one regulatory jurisdiction, with compliance standards that may differ from this Code. It is recommended that such reports include a statement alerting the reader to this situation. Where members of The AusIMM and the AIG are required to report in other jurisdictions, they are obliged to comply with the requirements of those jurisdictions.*

*The term ‘regulatory requirements’ as used in Clause 5 is not intended to cover reports provided to State and Federal Government agencies for statutory purposes, where providing information to the investing public is not the primary intent. If such reports become available to the public, they would not normally be regarded as Public Reports under the JORC Code (see also guidelines to Clauses 19 and 37).*

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*Reference in the Code to 'documentation' is to internal company documents prepared as a basis for, or to support, a Public Report.*

*It is recognised that situations may arise where documentation prepared by Competent Persons for internal company or similar non-public purposes does not comply with the JORC Code. In such situations, it is recommended that the documentation includes a prominent statement to this effect. This will make it less likely that non-complying documentation will be used to compile Public Reports, since Clause 8 requires Public Reports to fairly reflect Exploration Results, Mineral Resource and/or Ore Reserve estimates, and supporting documentation, prepared by a Competent Person.*

*While every effort has been made within the Code and Guidelines to cover most situations likely to be encountered in Public Reporting,, there may be occasions when doubt exists as to the appropriate form of disclosure. On such occasions, users of the Code and those compiling reports to comply with the Code should be guided by its intent, which is to provide a minimum standard for Public Reporting, and to ensure that such reporting contains all information which investors and*

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<p><i>their professional advisers would reasonably require, and reasonably expect to find in the report, for the purpose of making of a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Ore Reserves being reported.</i></p> <p>6. The Code is applicable to all solid minerals, including diamonds, other gemstones, industrial minerals and coal, for which Public Reporting of Exploration Results, Mineral Resources and Ore Reserves is required by the Australian and New Zealand Stock Exchanges.</p> <p><i>The JORC Code is cited by the ‘Code and Guidelines for Technical Assessment and/or Valuation of Mineral and Petroleum Assets and Mineral and Petroleum Securities for Independent Expert Reports’ (the ‘VALMIN Code’) as the applicable standard for the public reporting of Exploration Results, Mineral Resources and Ore Reserves. References to ‘technical and economic studies’ and ‘feasibility studies’ in the JORC Code are not intended as references to Technical Assessments or Valuations as defined in the VALMIN Code.</i></p> <p>7. JORC recognises that further review of the Code and Guidelines will be required from time to time.</p>	<p><i>require, and reasonably expect to find in the report, for the purpose of making of a reasoned and balanced judgement regarding the Exploration Results, Mineral Resources or Ore Reserves being reported.</i></p> <p>6. The Code is applicable to all solid minerals, including diamonds, other gemstones, industrial minerals and coal, for which Public Reporting of Exploration Results, Mineral Resources and Ore Reserves is required by the Australian Securities Exchange and the New Zealand Stock Exchange.</p> <p><i>The JORC Code is cited by the ‘Code and Guidelines for Technical Assessment and/or Valuation of Mineral and Petroleum Assets and Mineral and Petroleum Securities for Independent Expert Reports’ (the ‘VALMIN Code’) as the applicable standard for the public reporting of Exploration Results, Mineral Resources and Ore Reserves. References to ‘technical and economic studies’ and ‘feasibility studies’ in the JORC Code are not intended as references to Technical Assessments or Valuations as defined in the VALMIN Code.</i></p> <p>7. JORC recognises that further review of the Code and Guidelines will be required from time to time.</p>
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**Competence and Responsibility**

8. A Public Report concerning a company’s Exploration Results, Mineral Resources or Ore Reserves is the responsibility of the company acting through its Board of Directors. Any such report must be based on, and fairly reflect the information and supporting documentation prepared by a Competent Person or Persons. A company issuing a Public Report shall disclose the name(s) of the Competent Person or Persons, state whether the Competent Person is a full-time employee of the company, and, if not, name the Competent Person’s employer. The report shall be issued with the written consent of the Competent Person or Persons as to the form and context in which it appears.

*Appropriate forms of compliance statements may be as follows (delete bullet points which do not apply):*

- *If the required information is in the report:*

*“The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by (insert name of Competent Person), who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists or a ‘Recognised Overseas Professional Organisation’ (‘ROPO’) included in a list*

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*Any potential for a conflict of interest by the Competent Person or a related party should be disclosed in accordance with the Transparency principle. Any other relationship of the Competent Person with the Company making the report should also be disclosed in the Public Report. The report shall be issued with the prior written consent of the Competent Person or Persons as to the form and context in which it appears.*

*Where a company is re-issuing information previously issued with the written consent of the Competent Person in the form of a presentation, it must disclose the name(s) of the Competent Person or Persons, state the report name, date and reference the location of the original source public report for public access. In these circumstances the Company is not required to obtain the Competent Person or Person’s prior written consent as to the form and context in which the*

*promulgated by the ASX from time to time (select as appropriate and if a ROPO insert name of ROPO)”: or*

- *If the required information is included in an attached statement:*

*“The information in the report to which this statement is attached that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by (insert name of Competent Person), who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists or a ‘Recognised Overseas Professional Organisation’ (‘ROPO’) included in a list promulgated by the ASX from time to time (select as appropriate and if a ROPO insert name of ROPO)”.*

- *If the Competent Person is a full-time employee of the company:*

*“(Insert name of Competent Person) is a full-time employee of the company”.*

- *If the Competent Person is not a full-time employee of the company:*

*“(Insert name of Competent Person) is employed by (insert name of Competent Person’s employer)”.*

information appears, provided:

- The company confirms in the subsequent public presentation that it is not aware of any new information or data that materially affects the information included in the relevant market announcement and, in the case of estimates of mineral resources or ore reserves, that all material assumptions and technical parameters underpinning the estimates in the relevant market announcement continue to apply and have not materially changed.
- The company has confirmed that the form and context in which the Competent Person’s findings are presented have not been materially modified. Note that for the subsequent public presentation it is the responsibility of the company acting through its board of directors to ensure the form and context has not been materially altered.

This relaxation of the requirement to obtain the Competent Person’s prior written consent does not apply to the requirements for annual reporting of Mineral Resources and Ore Reserves contained in Clause 14.

*Appropriate forms of compliance statements may be as follows (delete bullet points which do not apply):*

- *If the required information is in the report:*

*“The information in this report that relates to Exploration Results, Mineral Resources or Ore Reserves is based on*

<ul style="list-style-type: none"> <li>• For all reports:   <i>“(Insert name of Competent Person) has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he (or she) is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the ‘Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves’. (Insert name of Competent Person) consents to the inclusion in the report of the matters based on his (or her) information in the form and context in which it appears”.</i> </li> </ul>	<p><i>information compiled by (insert name of Competent Person), who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists or a ‘Recognised Professional Organisation’ (‘RPO’) included in a list that is posted on the ASX website from time to time (select as appropriate and if a RPO insert name of RPO)”:</i> or</p> <ul style="list-style-type: none"> <li>• <i>If the required information is included in an attached statement:</i>   <i>“The information in the report to which this statement is attached that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by (insert name of Competent Person), who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists or a ‘Recognised Professional Organisation’ (‘RPO’) included on a list posted on the ASX website from time to time (select as appropriate and if a RPO insert name of RPO)”.</i> </li> <li>• <i>If the Competent Person is a full-time employee of the company:</i>   <i>“(Insert name of Competent Person) is a full-time employee of the company”.</i> </li> <li>• <i>If the Competent Person is not a full-time employee of</i> </li> </ul>
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	<p><i>the company:</i></p> <p><i>“(Insert name of Competent Person) is employed by (insert name of Competent Person’s employer)”.</i></p> <ul style="list-style-type: none"> <li><i>If any undisclosed relationship between the Competent Person and the reporting Company were to exist, investor confidence in the Public Report could be undermined, and therefore the full nature the relationship between the Competent Person and the reporting Company should be declared together with the Competent Persons details. This declaration should outline and clarify any issue that could be perceived by investors as a conflict of interest.</i></li> <li><i>For all reports:</i> <p><i>“(Insert name of Competent Person) has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he (or she) is undertaking to qualify as a Competent Person as defined in the 2004 Edition of the ‘Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves’. (Insert name of Competent Person) consents to the inclusion in the report of the matters based on his (or her) information in the form and context in which it appears”.</i></p> <ul style="list-style-type: none"> <li><i>For public presentations based on previously issued</i></li> </ul> </li> </ul>
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*Public Reports:*

*Where a Competent Person has previously issued the written consent to the inclusion of their findings in a report, a company re-issuing that information to the Public in the form of a presentation must disclose the name(s) of the Competent Person or Persons, state the report name, date and reference the location of the original source public report for public access.*

*“The information in this presentation that relates to Exploration Results, Mineral Resources or Ore Reserves is based on information compiled by (insert name of Competent Person), who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy or the Australian Institute of Geoscientists or a ‘Recognised Professional Organisation’ (‘RPO’). The information is extracted from the report entitled (name report) created on (date) and is available to view on (website name)”.*

*All such public presentations should be specifically reviewed by the company to ensure that the form and context of in which the Competent Person’s findings are presented have not been materially modified, and to ensure that the previously issued Exploration Results, Mineral Resources or Ore Reserve remains valid in the light of any more recently acquired data*

*In order to assist Competent Persons and companies to comply with these requirements a Competent Person's*

<p>9. Documentation detailing Exploration Results, Mineral Resource and Ore Reserve estimates, on which a Public Report on Exploration Results, Mineral Resources and Ore Reserves is based, must be prepared by, or under the direction of, and signed by, a Competent Person or Persons. The documentation must provide a fair representation of the Exploration Results, Mineral Resources or Ore Reserves being reported.</p> <p>10. <b>A ‘Competent Person’ is a person who is a Member or Fellow of The Australasian Institute of Mining and Metallurgy, or of</b></p>	<p><i>Consent Form has been devised that incorporates the requirements of the Code. The Competent Person’s Consent Form is provided in Appendix 2.</i></p> <p><i>The completion of a consent form, whether in the format provided or in an equivalent form, is recommended as good practice and provides readily available evidence that the required prior consent has been obtained.</i></p> <p><i>The Competent Person's Consent Form(s), or other evidence of the Competent Person's written consent, should be retained by the company and the Competent Person to ensure that the written consent can be promptly provided if required.</i></p> <p>9 Documentation detailing Exploration Results, Mineral Resource and Ore Reserve estimates, on which a Public Report on Exploration Results, Mineral Resources and Ore Reserves is based, must be prepared by, or under the direction of, and signed by, a Competent Person or Persons. The documentation must provide a fair representation of the Exploration Results, Mineral Resources or Ore Reserves being reported.</p> <p><b>10 A ‘Competent Person’ is a minerals industry professional who is Member or Fellow of The Australasian Institute of Mining and</b></p>
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the Australian Institute of Geoscientists, or of a 'Recognised Overseas Professional Organisation' ('ROPO') included in a list promulgated from time to time.

A 'Competent Person' must have a minimum of five years experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which that person is undertaking.

If the Competent Person is preparing a report on Exploration Results, the relevant experience must be in exploration. If the Competent Person is estimating, or supervising the estimation of Mineral Resources, the relevant experience must be in the estimation, assessment and evaluation of Mineral Resources. If the Competent Person is estimating, or supervising the estimation of Ore Reserves, the relevant experience must be in the estimation, assessment, evaluation and economic extraction of Ore Reserves.

*The key qualifier in the definition of a Competent Person is the word 'relevant'. Determination of what constitutes relevant experience can be a difficult area and common sense has to be exercised. For example, in estimating Mineral Resources for vein gold mineralisation, experience in a high-nugget, vein-type mineralisation such as tin, uranium etc. will probably be relevant whereas experience*

Metallurgy, or of the Australian Institute of Geoscientists, or of a 'Recognised Professional Organisation' ('RPO'), as included in a list promulgated from time to time, **with enforceable disciplinary processes including the powers to suspend or expel a member.**

A Competent Person must have a minimum of five years relevant experience in the style of mineralisation **or type of deposit under consideration and in the activity which that person is undertaking.**

If the Competent Person is preparing **documentation** on Exploration Results, the relevant experience must be in exploration. If the Competent Person is estimating, or supervising the estimation of Mineral Resources, the relevant experience must be in the estimation, assessment and evaluation of Mineral Resources. If the Competent Person is estimating, or supervising the estimation of Ore Reserves, the relevant experience must be in the estimation, assessment, evaluation and economic extraction of Ore Reserves.

*The key qualifier in the definition of a Competent Person is the word 'relevant'. Determination of what constitutes relevant experience can be a difficult area and common sense has to be exercised. For example, in estimating Mineral Resources for vein gold mineralisation, experience in a high-nugget, vein-type mineralisation such as tin,*

*in (say) massive base metal deposits may not be. As a second example, to qualify as a Competent Person in the estimation of Ore Reserves for alluvial gold deposits, considerable (probably at least five years) experience in the evaluation and economic extraction of this type of mineralisation would be needed. This is due to the characteristics of gold in alluvial systems, the particle sizing of the host sediment, and the low grades involved. Experience with placer deposits containing minerals other than gold may not necessarily provide appropriate relevant experience.*

*The key word ‘relevant’ also means that it is not always necessary for a person to have five years experience in each and every type of deposit in order to act as a Competent Person if that person has relevant experience in other deposit types. For example, a person with (say) 20 years experience in estimating Mineral Resources for a variety of metalliferous hard-rock deposit types may not require five years specific experience in (say) porphyry copper deposits in order to act as a Competent Person. Relevant experience in the other deposit types could count towards the required experience in relation to porphyry copper deposits.*

*In addition to experience in the style of mineralisation, a*

*uranium etc. will be relevant whereas experience in (say) massive base metal deposits may not be. As a second example, to qualify as a Competent Person in the estimation of Ore Reserves for alluvial gold deposits, considerable (at least five years) experience in the evaluation and economic extraction of this type of mineralisation would be needed. This is due to the characteristics of gold in alluvial systems, the particle sizing of the host sediment, and the low grades involved. Experience with placer deposits containing minerals other than gold may not necessarily provide appropriate relevant experience.*

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*Competent Person taking responsibility for the compilation of Exploration Results or Mineral Resource estimates should have sufficient experience in the sampling and analytical techniques relevant to the deposit under consideration to be aware of problems which could affect the reliability of data. Some appreciation of extraction and processing techniques applicable to that deposit type may also be important.*

*As a general guide, persons being called upon to act as Competent Persons should be clearly satisfied in their own minds that they could face their peers and demonstrate competence in the commodity, type of deposit and situation under consideration. If doubt exists, the person should either seek opinions from appropriately experienced colleagues or should decline to act as a Competent Person.*

*Estimation of Mineral Resources may be a team effort (for example, involving one person or team collecting the data and another person or team preparing the estimate). Estimation of Ore Reserves is very commonly a team effort involving several technical disciplines. It is recommended that, where there is clear division of responsibility within a team, each Competent Person and his or her contribution should be identified, and responsibility accepted for that particular contribution. If only one Competent Person signs the Mineral Resource or Ore Reserve documentation,*

*In addition to experience in the style of mineralisation, a Competent Person taking responsibility for the compilation of Exploration Results or Mineral Resource estimates should have sufficient experience in the sampling and analytical techniques relevant to the deposit under consideration to be aware of problems which could affect the reliability of data. Some appreciation of extraction and processing techniques applicable to that deposit type may also be important.*

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*that person is responsible and accountable for the whole of the documentation under the Code. It is important in this situation that the Competent Person accepting overall responsibility for a Mineral Resource or Ore Reserve estimate and supporting documentation prepared in whole or in part by others, is satisfied that the work of the other contributors is acceptable.*

*Complaints made in respect of the professional work of a Competent Person will be dealt with under the disciplinary procedures of the professional organisation to which the Competent Person belongs.*

*When an Australian or New Zealand Stock Exchange listed company with overseas interests wishes to report overseas Exploration Results, Mineral Resource or Ore Reserve estimates prepared by a person who is not a member of The AusIMM, the AIG or a ROPO, it is necessary for the company to nominate a Competent Person or Persons to take responsibility for the Exploration Results, Mineral Resource or Ore Reserve estimate. The Competent Person or Persons undertaking this activity should appreciate that they are accepting full responsibility for the estimate and supporting documentation under Stock Exchange listing rules and should not treat the procedure merely as a ‘rubber-stamping’ exercise.*

*documentation under the Code. It is important in this situation that the Competent Person accepting overall responsibility for a Mineral Resource or Ore Reserve estimate and supporting documentation prepared in whole or in part by others, is satisfied that the work of the other contributors is acceptable.*

*Complaints made in respect of the professional work of a Competent Person will be dealt with under the disciplinary procedures of the professional organisation to which the Competent Person belongs.*

*When an Australian **Securities Exchange** or New Zealand Stock Exchange listed company with overseas interests wishes to report overseas Exploration Results, Mineral Resource or Ore Reserve estimates prepared by a person who is not a member of The AusIMM, the AIG or a RPO, it is necessary for the company to nominate a Competent Person or Persons to take responsibility for the Exploration Results, Mineral Resource or Ore Reserve estimate. The Competent Person or Persons undertaking this activity should appreciate that they are accepting full responsibility for the estimate and supporting documentation **under Australian Securities Exchange and the New Zealand Stock Exchange listing rules** and should not treat the procedure merely as a ‘rubber-stamping’ exercise.*

**Reporting Terminology**

11. Public Reports dealing with Exploration Results, Mineral Resources or Ore Reserves must only use the terms set out in Figure 1.

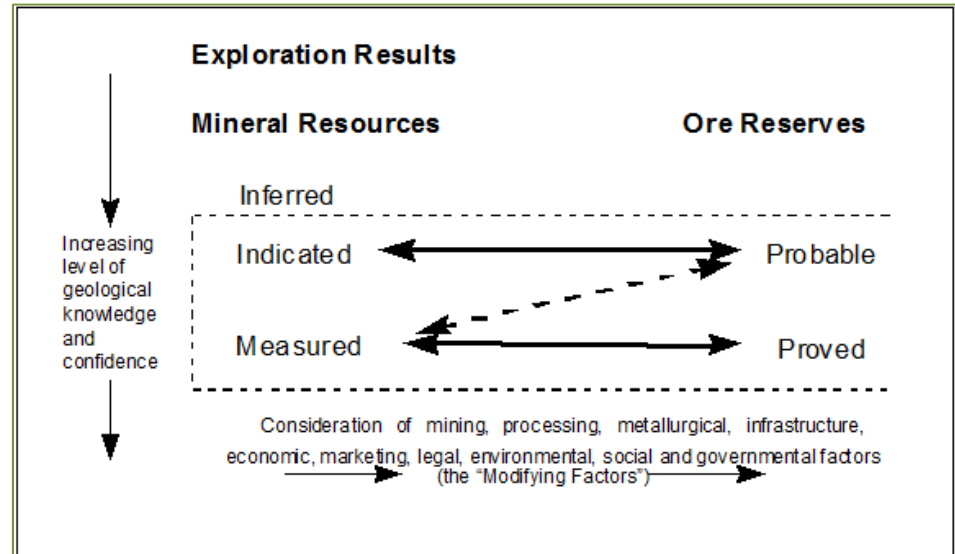
**The term ‘Modifying Factors’ is defined to include mining, metallurgical, economic, marketing, legal, environmental, social and governmental considerations.**

*Figure 1 sets out the framework for classifying tonnage and grade estimates to reflect different levels of geological confidence and different degrees of technical and economic evaluation. Mineral Resources can be estimated mainly by a geologist on the basis of geoscientific information with some input from other disciplines. Ore Reserves, which are a modified sub-set of the Indicated and Measured Mineral Resources (shown within the dashed outline in Figure 1), require consideration of the Modifying Factors affecting extraction, and should in most instances be estimated with input from a range of disciplines.*

*Measured Mineral Resources may convert to either Proved Ore Reserves or Probable Ore Reserves. The Competent Person may convert Measured Mineral Resources to Probable Ore Reserves because of uncertainties associated*

**Reporting Terminology**

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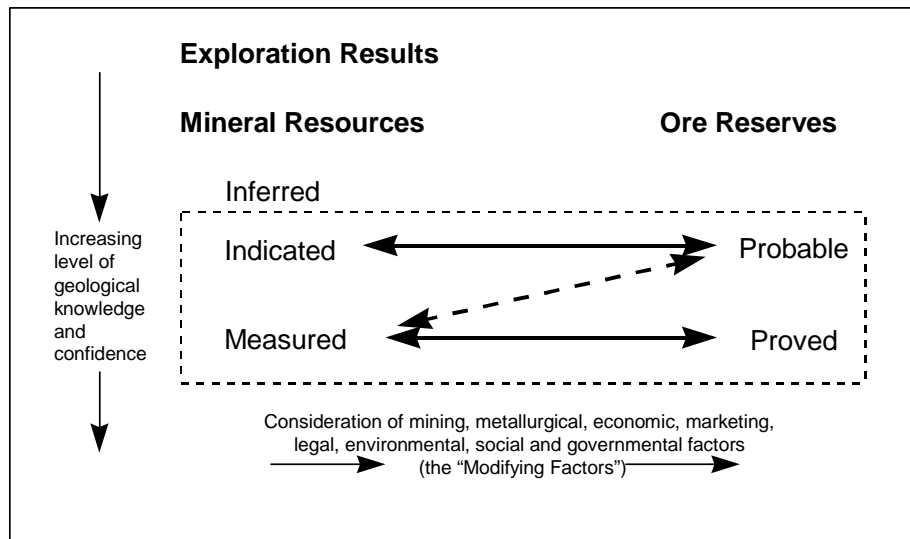
**Figure 1. General relationship between Exploration Results, Mineral Resources and Ore Reserves** (changes in figure)

*Figure 1 sets out the framework for classifying tonnage and grade estimates to reflect different levels of geological confidence and different degrees of technical and economic evaluation. Mineral Resources can be estimated mainly by a*



*with some or all of the Modifying Factors which are taken into account in the conversion from Mineral Resources to Ore Reserves. This relationship is shown by the broken arrow in Figure 1. Although the trend of the broken arrow includes a vertical component, it does not, in this instance, imply a reduction in the level of geological knowledge or confidence. In such a situation these Modifying Factors should be fully explained.*

*Refer also to the guidelines to Clause 31.*



**Figure 1. General relationship between Exploration Results, Mineral Resources and Ore Reserves**

*geologist on the basis of geoscientific information with some input from other disciplines. Ore Reserves, which are a modified sub-set of the Indicated and Measured Mineral Resources (shown within the dashed outline in Figure 1), require consideration of the Modifying Factors affecting extraction, and should in most instances be estimated with input from a range of disciplines.*

**‘Modifying Factors’ are considerations used to convert Mineral Resources to Ore Reserves. These include, but are not restricted to mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.**

*Measured Mineral Resources may be converted to either Proved Ore Reserves or Probable Ore Reserves. The Competent Person may convert Measured Mineral Resources to Probable Ore Reserves because of uncertainties associated with some or all of the Modifying Factors which are taken into account in the conversion from Mineral Resources to Ore Reserves. This relationship is shown by the broken arrow in Figure 1. Although the trend of the broken arrow includes a vertical component, it does not, in this instance, imply a reduction in the level of geological knowledge or confidence. In such a situation these Modifying Factors should be fully explained. Refer also to the guidelines to Clause 31.*

<p><b>Reporting – General</b></p> <p>12. Public Reports concerning a company’s Exploration Results, Mineral Resources or Ore Reserves should include a description of the style and nature of the mineralisation.</p> <p>13. A company must disclose any relevant information concerning a mineral deposit that could materially influence the economic value of that deposit to the company. A company must promptly report any material changes in its Mineral Resources or Ore Reserves.</p> <p>14. Companies must review and publicly report on their Mineral Resources and Ore Reserves at least annually.</p> <p>15. Throughout the Code, if appropriate, ‘quality’ may be substituted for ‘grade’ and ‘volume’ may be substituted for ‘tonnage’. (Refer Appendix 1 – Table of Generic Terms and Equivalents).</p> <p><b>New Clause → clause 16 is a redrafted and expanded JORC 2004 clause 18, moved out of exploration results section to properly reflect the preliminary nature of such declarations.</b></p>	<p><b>Reporting – General</b></p> <p>12. Public Reports concerning a company’s Exploration Results, Mineral Resources or Ore Reserves <b>must include</b> a description of the style and nature of the mineralisation.</p> <p>13. A company must disclose any relevant information concerning a mineral deposit that could materially influence the economic value of that deposit to the company. A company must promptly report any material changes in its Mineral Resources or Ore Reserves.</p> <p>14. Companies <b>must review and publically report their Mineral Resources and Ore Reserves annually.</b> The annual review date must be nominated by the Company in its Public Reports of Mineral Resources and Ore Reserves. The Company must discuss any material changes to previously reported Mineral Resources and Ore Reserves at the time of publishing updated Mineral Resources and Ore Reserves.</p> <p>15. Throughout the Code, if appropriate, ‘quality’ may be substituted for ‘grade’ and ‘volume’ may be substituted for ‘tonnage’. (Refer Appendix 1 – Table of Generic Terms and Equivalents).</p> <p>16. It is recognised that it is common practice for a company to comment on and discuss its exploration in terms of target size and type. However, any such comment in a Public Report must comply with the following requirements.</p>
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	<p><b>An Exploration Target is a statement or estimate in a Public Report of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate relates to mineralisation for which there has been insufficient exploration to estimate a Mineral Resource.</b></p> <p>Any such information relating to an Exploration Target must be expressed so that it cannot be misrepresented or misconstrued as an estimate of a Mineral Resource or Ore Reserve. The terms Resource or Reserve must not be used in this context. Any statement referring to potential quantity and grade of the target must both be expressed as ranges and must include:</p> <ul style="list-style-type: none"> <li>• a detailed explanation of the basis for the statement, including specific description of the level of exploration testing already completed and,</li> <li>• a clarification statement within the same paragraph as the first reference of the Exploration Target in the Public Report, stating that the potential quantity and grade is conceptual in nature, that there has been insufficient exploration to estimate a Mineral Resource and that it is uncertain if further exploration will result in the estimation of a Mineral Resource.</li> </ul> <p>Given the level of uncertainty surrounding the supporting data, an Exploration Target tonnage or grade must not be reported as a ‘headline statement’ in a Public Report.</p> <p>If a Public Report includes an Exploration Target, it is a</p>
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	<p>requirement to detail proposed exploration activities designed to test the validity of the exploration target and to specify a timeframe within which those activities are expected to be completed.</p> <p>If an Exploration Target is shown pictorially or with a graph, it must be accompanied by text which meets the requirements above.</p> <p>A Public Report which includes an Exploration Target must be accompanied by a Competent Person statement taking responsibility for the form and context in which the Exploration Target appears.</p> <p><i>All disclosures of an Exploration Target should clarify whether the target is based on actual exploration results completed or on proposed exploration programs yet to commence. Where the Exploration Target statement includes information relating to ranges of tonnages and grades these should be represented as approximations. The explanatory text paragraphs should include a brief description of the process used to determine the grade and tonnage ranges used to describe the Exploration Target.</i></p> <p><i>For an Exploration Target based on actual exploration results, a summary of the relevant exploration data available and the nature of the results should also be stated, including a disclosure of the current drill hole or sampling spacing and</i></p>
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<p><b>Reporting of Exploration Results</b></p> <p><b>16. Exploration Results include data and information generated by exploration programmes that may be of use to investors. The Exploration Results may or may not be part of a formal declaration of Mineral Resources or Ore Reserves.</b></p> <p>The reporting of such information is common in the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of Mineral Resources.</p> <p>If a company reports Exploration Results in relation to mineralisation not classified as a Mineral Resource or an Ore Reserve, then estimates of tonnages and average grade must not be assigned to the mineralisation unless the situation is covered by Clause 18, and then only in strict accordance with the requirements of that clause.</p> <p><i>Examples of Exploration Results include results of outcrop sampling, assays of drill hole intercepts, geochemical results and geophysical survey results.</i></p>	<p><i>relevant plans or sections. In any subsequent upgraded or modified statements on the Exploration Target, the Competent Person should discuss any material changes to potential scale or quality arising from completed exploration activities.</i></p> <p><b>Reporting of Exploration Results</b></p> <p><b>17. Exploration Results include data and information generated by mineral exploration programmes that might be of use to investors but which do not form part of a declaration of Mineral Resources or Ore Reserves.</b></p> <p>The reporting of such information is common in the early stages of exploration when the quantity of data available is generally not sufficient to allow any reasonable estimates of Mineral Resources.</p> <p>If a company reports Exploration Results in relation to mineralisation not classified as a Mineral Resource or an Ore Reserve, then estimates of tonnages and average grade must not be assigned to the mineralisation unless the situation is covered by Clause 16, and then only in strict accordance with the requirements of that clause.</p> <p><i>Examples of Exploration Results include results of outcrop sampling, assays of drill hole intercepts, geochemical results and geophysical survey results.</i></p>
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17. Public Reports of Exploration Results must contain sufficient information to allow a considered and balanced judgement of their significance. Reports must include relevant information such as exploration context, type and method of sampling, sampling intervals and methods, relevant sample locations, distribution, dimensions and relative location of all relevant assay data, data aggregation methods, land tenure status plus information on any of the other criteria listed in Table 1 that are material to an assessment.

Public Reports of Exploration Results must not be presented so as to unreasonably imply that potentially economic mineralisation has been discovered.

If true widths of mineralisation are not reported, an appropriate qualification must be included in the Public Report.

Where assay and analytical results are reported, they must be reported using one of the following methods, selected as the most appropriate by the Competent Person:

- either by listing all results, along with sample intervals (or size, in the case of bulk samples), or
- by reporting weighted average grades of mineralised zones, indicating clearly how the grades were calculated.

18. Public Reports of Exploration Results must contain sufficient information to allow a considered and balanced judgement of their significance. Reports must include relevant information such as exploration context, type and method of sampling, sampling intervals and methods, relevant sample locations, distribution, dimensions and relative location of all relevant assay data, data aggregation methods, land tenure status plus information on any of the other criteria listed in Table 1 that are material to an assessment.

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- either by listing all results, along with sample intervals (or size, in the case of bulk samples), or
- by reporting weighted average grades of mineralised zones, indicating clearly how the grades were calculated.

Reporting of selected information such as isolated assays, isolated drill holes, assays of panned concentrates or supergene enriched soils or surface samples, without placing them in perspective is unacceptable.

*Table 1 is a check list and guideline to which those preparing reports on Exploration Results, Mineral Resources and Ore Reserves should refer. The check list is not prescriptive and, as always, relevance and materiality are overriding principles which determine what information should be publicly reported.*

Clear diagrams and maps designed to represent the geological context must be included in the report. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.

Reporting of selected information such as isolated assays, isolated drill holes, assays of panned concentrates or supergene enriched soils or surface samples, without placing them in perspective is unacceptable.

*While it is not necessary to report all assays or drill holes, it is a requirement that sufficient information about the omitted data is provided so that a considered and balanced judgement can be made by the reader of the report. Where reports of Exploration Results do not include all drill holes or all intersections of drill holes the Competent Person must provide an explanation of why this information is not considered relevant or why it has not been provided.*

*As required under clause 4, the Competent Person must not 'remain silent on any issue for which the presence or absence of comment could impact the public perception or value of the mineral occurrence'*

*For significant projects the reporting of all criterion in Table 1 on an 'if not, why not basis' is particularly important where inadequate or uncertain data affect the reliability of, or confidence in, a statement of Exploration Results; for*

<p>18. It is recognised that it is common practice for a company to comment on and discuss its exploration in terms of target size and type. Any such information relating to exploration targets must be expressed so that it cannot be misrepresented or misconstrued as an estimate of Mineral Resources or Ore Reserves. The terms Resource(s) or Reserve(s) must not be used in this context. Any statement referring to potential quantity and grade of the target must be expressed as ranges and must include (1) a detailed explanation of the basis for the statement, and (2) a proximate statement that the potential quantity and grade is conceptual in nature, that there has been insufficient exploration to define a Mineral Resource and that it is uncertain if further exploration will result in the determination of a Mineral Resource.</p> <p><b>Reporting of Mineral Resources</b></p> <p>19. <b>A ‘Mineral Resource’ is a concentration or occurrence of material of intrinsic economic interest in or on the Earth’s crust in such form, quality and quantity that there are</b></p>	<p><i>example, poor sample recovery, poor repeatability of assay or laboratory results etc.</i></p> <p><b>← Old Clause 18 moved up to Clause 16 and removed from this section</b></p> <p><b>Reporting of Mineral Resources</b></p> <p>19. <b>A ‘Mineral Resource’ is a concentration or occurrence of material of economic interest in or on the Earth’s crust in such form, grade/quality and quantity that there are reasonable prospects for eventual economic extraction. The location,</b></p>
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**reasonable prospects for eventual economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge. Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.**

Portions of a deposit that do not have reasonable prospects for eventual economic extraction must not be included in a Mineral Resource. If the judgement as to ‘eventual economic extraction’ relies on untested practices or assumptions, this is a material matter which must be disclosed in a public report.

**quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.**

Mineral Resources are sub-divided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.

All reports of Mineral Resources must satisfy the requirement that there are reasonable prospects for eventual economic extraction (i.e. more likely than not), regardless of the classification of the resource.

Portions of a deposit that do not have reasonable prospects for eventual economic extraction must not be included in a Mineral Resource. The basis for the reasonable prospects assumptions is always a material matter, and must be explicitly disclosed and discussed by the Competent Person(s) within the Public Report

Where untested practices are applied in the determination of reasonable prospects then the use of the proposed practices for reporting of the Mineral Resource must be justified by the Competent Person in the Public Report.

Where a Mineral Resource is reported at an average grade or above a cut-off grade (or at an equivalent average grade or above an equivalent cut-off grade) that is not currently economic, the

<p><i>The term ‘Mineral Resource’ covers mineralisation, including dumps and tailings, which has been identified and estimated through exploration and sampling and within which Ore Reserves may be defined by the consideration and application of the Modifying Factors.</i></p> <p><i>The term ‘reasonable prospects for eventual economic extraction’ implies a judgement (albeit preliminary) by the Competent Person in respect of the technical and economic factors likely to influence the prospect of economic extraction, including the approximate mining parameters. In other words, a Mineral Resource is not an inventory of all mineralisation drilled or sampled, regardless of cut-off grade, likely mining dimensions, location or continuity. It is a realistic inventory of</i></p>	<p>conditions under which it would be economic must be stated, and the Competent Person must provide justification for including these Mineral Resources at the time of making the Public Report.</p> <p>Geological evidence and knowledge required for the estimation of Mineral Resources must include sampling data of a type, and at spacings, appropriate to the geological, chemical, physical, and mineralogical complexity of the mineral occurrence, for all classifications of Inferred, Indicated and Measured Mineral Resources. A Mineral Resource cannot be estimated in the absence of sampling information.</p> <p><i>The term ‘Mineral Resource’ covers mineralisation, including dumps and tailings, which has been identified and estimated through exploration and sampling and within which Ore Reserves may be defined by the consideration and application of the Modifying Factors.</i></p> <p><i>The term ‘reasonable prospects for eventual economic extraction’ implies an assessment (albeit preliminary) by the Competent Person in respect of the Modifying Factors likely to influence the prospect of economic extraction, including the approximate mining parameters. In other words, a Mineral Resource is not an inventory of all mineralisation drilled or sampled, regardless of cut-off grade, likely mining dimensions location or continuity. It is a realistic inventory of mineralisation which, under assumed and justifiable</i></p>
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*mineralisation which, under assumed and justifiable technical and economic conditions, might, in whole or in part, become economically extractable.*

*Where considered appropriate by the Competent Person, Mineral Resource estimates may include material below the selected cut-off grade to ensure that the Mineral Resources comprise bodies of mineralisation of adequate size and continuity to properly consider the most appropriate approach to mining. Documentation of Mineral Resource estimates should clearly identify any diluting material included, and Public Reports should include commentary on the matter if considered material.*

*Any material assumptions made in determining the ‘reasonable prospects for eventual economic extraction’ should be clearly stated in the Public Report.*

*Interpretation of the word ‘eventual’ in this context may vary depending on the commodity or mineral involved. For example, for some coal, iron ore, bauxite and other bulk minerals or commodities, it may be reasonable to envisage ‘eventual economic extraction’ as covering time periods in excess of 50 years. However for the majority of gold deposits, application of the concept would normally be restricted to perhaps 10 to 15 years, and frequently to*

*technical, economic and development conditions, might, in whole or in part, become economically extractable.*

*Where considered appropriate by the Competent Person, Mineral Resource estimates may include material below the selected cut-off grade to ensure that the Mineral Resources comprise bodies of mineralisation of adequate size and continuity to properly consider the most appropriate approach to mining. Documentation of Mineral Resource estimates should clearly identify any diluting material included, and Public Reports should include commentary on the matter if considered Material.*

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*much shorter periods of time.*

*Any adjustment made to the data for the purpose of making the Mineral Resource estimate, for example by cutting or factoring grades, should be clearly stated and described in the Public Report.*

*Certain reports (eg: inventory coal reports, exploration reports to government and other similar reports not intended primarily for providing information for investment purposes) may require full disclosure of all mineralisation, including some material that does not have reasonable prospects for eventual economic extraction. Such estimates of mineralisation would not qualify as Mineral Resources or Ore Reserves in terms of the JORC Code (refer also to the guidelines to Clauses 5 and 37).*

**20. An ‘Inferred Mineral Resource’ is that part of a Mineral Resource for which tonnage, grade and mineral content can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified geological and/or grade continuity. It is based on information gathered through appropriate techniques from locations such as**

*timeframe should be disclosed and discussed by the Competent Person.*

*Any adjustment made to the data for the purpose of making the Mineral Resource estimate, for example by cutting or factoring grades, should be clearly stated and described in the Public Report.*

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**20. An ‘Inferred Mineral Resource’ is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade continuity. It is based on exploration, sampling and testing information gathered through appropriate**

**outcrops, trenches, pits, workings and drill holes which may be limited or of uncertain quality and reliability.**

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource.

*The Inferred category is intended to cover situations where a mineral concentration or occurrence has been identified and limited measurements and sampling completed, but where the data are insufficient to allow the geological and/or grade continuity to be confidently interpreted. Commonly, it would be reasonable to expect that the majority of Inferred Mineral Resources would upgrade to Indicated Mineral Resources with continued exploration. However, due to the uncertainty of Inferred Mineral Resources, it should not be assumed that such upgrading will always occur.*

**techniques from locations such as outcrops, trenches, pits, workings and drill holes.**

**An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to an Ore Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.**

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

*The Inferred category is intended to cover situations where a mineral concentration or occurrence has been identified and limited measurements and sampling completed, but where the data are insufficient to allow the geological and/or grade continuity to be confidently interpreted. While it would be reasonable to expect that the majority of Inferred Mineral Resources would upgrade to Indicated Mineral Resources with continued exploration, due to the uncertainty of Inferred Mineral Resources, it should not be assumed that such upgrading will always occur.*

*Confidence in the estimate of Inferred Mineral Resources is*

*Confidence in the estimate of Inferred Mineral Resources is usually not sufficient to allow the results of the application of technical and economic parameters to be used for detailed planning. For this reason, there is no direct link from an Inferred Resource to any category of Ore Reserves (see Figure 1).*

*Caution should be exercised if this category is considered in technical and economic studies.*

*usually not sufficient to allow the results of the application of technical and economic parameters to be used for detailed planning. For this reason, there is no direct link from an Inferred Resource to any category of Ore Reserves (see Figure 1).*

*Caution should be exercised if this category is considered in technical and economic studies.*

*In circumstances where the estimation of the Inferred Resource is presented on the basis of extrapolation, the principles of Materiality and Transparency require the report to contain sufficient information to inform the reader of:*

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

**21. An ‘Indicated Mineral Resource’ is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a reasonable level of confidence. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed.**

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource, but has a higher level of confidence than that applying to an Inferred Mineral Resource.

*Mineralisation may be classified as an Indicated Mineral Resource when the nature, quality, amount and distribution of data are such as to allow confident interpretation of the geological framework and to assume continuity of mineralisation.*

*Confidence in the estimate is sufficient to allow the application of technical and economic parameters, and to enable an evaluation of economic viability.*

**21 An ‘Indicated Mineral Resource’ is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.**

**Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes, and is sufficient to assume geological and grade/quality continuity between points where data and samples are gathered.**

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

*Mineralisation may be classified as an Indicated Mineral Resource when the nature, quality, amount and distribution of data are such as to allow confident interpretation of the geological framework and to assume continuity of mineralisation.*

<p>22. A ‘Measured Mineral Resource’ is that part of a Mineral Resource for which tonnage, densities, shape, physical characteristics, grade and mineral content can be estimated with a high level of confidence. It is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are spaced closely enough to confirm geological and grade continuity.</p> <p><i>Mineralisation may be classified as a Measured Mineral Resource when the nature, quality, amount and distribution of data are such as to leave no reasonable doubt, in the opinion of the Competent Person determining the Mineral Resource, that the tonnage and grade of the mineralisation can be estimated to within</i></p>	<p>22 A ‘Measured Mineral Resource’ is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.</p> <p>Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes, and is sufficient to confirm geological and grade/quality continuity between points where data and samples are gathered.</p> <p>A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Ore Reserve or under certain circumstances to a Probable Ore Reserve.</p> <p><i>Mineralisation may be classified as a Measured Mineral Resource when the nature, quality, amount and distribution of data are such as to leave no reasonable doubt, in the opinion of the Competent Person determining the Mineral Resource, that the tonnage and grade of the mineralisation can be estimated to within close limits, and that any</i></p>
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<p><i>close limits, and that any variation from the estimate would be unlikely to significantly affect potential economic viability.</i></p> <p><i>This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.</i></p> <p><i>Confidence in the estimate is sufficient to allow the application of technical and economic parameters and to enable an evaluation of economic viability that has a greater degree of certainty than an evaluation based on an Indicated Mineral Resource.</i></p> <p>23. The choice of the appropriate category of Mineral Resource depends upon the quantity, distribution and quality of data available and the level of confidence that attaches to those data. The appropriate Mineral Resource category must be determined by a Competent Person or Persons.</p> <p><i>Mineral Resource classification is a matter for skilled judgement and Competent Persons should take into account those items in Table 1 which relate to confidence in Mineral Resource estimation.</i></p> <p><i>In deciding between Measured Mineral Resources and</i></p>	<p><i>variation from the estimate would be unlikely to significantly affect potential economic viability.</i></p> <p><i>This category requires a high level of confidence in, and understanding of, the geological properties and controls of the mineral deposit.</i></p> <p>23. The choice of the appropriate category of Mineral Resource depends upon the quantity, distribution and quality of data available and the level of confidence that attaches to those data. The appropriate Mineral Resource category must be determined by a Competent Person or Persons.</p> <p><i>Mineral Resource classification is a matter for skilled judgement and Competent Persons should take into account those items in Table 1 which relate to confidence in Mineral Resource estimation.</i></p> <p><i>In deciding between Measured Mineral Resources and</i></p>
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*Indicated Mineral Resources, Competent Persons may find it useful to consider, in addition to the phrases in the two definitions relating to geological and grade continuity in Clauses 21 and 22, the phrase in the guideline to the definition for Measured Mineral Resources: ‘... any variation from the estimate would be unlikely to significantly affect potential economic viability’.*

*In deciding between Indicated Mineral Resources and Inferred Mineral Resources, Competent Persons may wish to take into account, in addition to the phrases in the two definitions in Clauses 20 and 21 relating to geological and grade continuity, the guideline to the definition for Indicated Mineral Resources: ‘Confidence in the estimate is sufficient to allow the application of technical and economic parameters and to enable an evaluation of economic viability’, which contrasts with the guideline to the definition for Inferred Mineral Resources: ‘Confidence in the estimate of Inferred Mineral Resources is usually not sufficient to allow the results of the application of technical and economic parameters to be used for detailed planning.’ and ‘Caution should be exercised if this category is considered in technical and economic studies’.*

*The Competent Person should take into consideration issues of the style of mineralisation and cut-off grade*

*Indicated Mineral Resources, Competent Persons may find it useful to consider, in addition to the phrases in the two definitions relating to geological and grade continuity in Clauses 21 and 22, the phrase in the guideline to the definition for Measured Mineral Resources: ‘... any variation from the estimate would be unlikely to significantly affect potential economic viability’.*

*In deciding between Indicated Mineral Resources and Inferred Mineral Resources, Competent Persons may wish to take into account, in addition to the phrases in the two definitions in Clauses 20 and 21 relating to geological and grade continuity, that part of the definition for Indicated Mineral Resources: ‘**sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit**’, which contrasts with the guideline to the definition for Inferred Mineral Resources: ‘Confidence in the estimate of Inferred Mineral Resources is usually not sufficient to allow the results of the application of technical and economic parameters to be used for detailed planning.’ and ‘Caution should be exercised if this category is considered in technical and economic studies’.*

*The Competent Person should take into consideration issues of the style of mineralisation and cut-off grade when*

*when assessing geological and grade continuity.*

*Cut-off grades chosen for the estimation should be realistic in relation to the style of mineralisation.*

24. Mineral Resource estimates are not precise calculations, being dependent on the interpretation of limited information on the location, shape and continuity of the occurrence and on the available sampling results. Reporting of tonnage and grade figures should reflect the relative uncertainty of the estimate by rounding off to appropriately significant figures and, in the case of Inferred Mineral Resources, by qualification with terms such as ‘approximately’.

*In most situations, rounding to the second significant figure should be sufficient. For example 10,863,000 tonnes at 8.23 per cent should be stated as 11 million tonnes at 8.2 per cent. There will be occasions, however, where rounding to the first significant figure may be necessary in order to convey properly the uncertainties in estimation. This would usually be the case with Inferred Mineral Resources.*

*To emphasise the imprecise nature of a Mineral Resource estimate, the final result should always be referred to as*

*assessing geological and grade continuity.*

*Cut-off grades chosen for the estimation should be realistic in relation to the style of mineralisation and the anticipated mining and processing development pathways.*

24. Mineral Resource estimates are not precise calculations, being dependent on the interpretation of limited information on the location, shape and continuity of the occurrence and on the available sampling results. Reporting of tonnage and grade figures should reflect the relative uncertainty of the estimate by rounding off to appropriately significant figures and, in the case of Inferred Mineral Resources, by qualification with terms such as ‘approximately’ and to emphasise the imprecise nature of a Mineral Resource, the final result should always be referred to as an estimate not a calculation.

*In most situations, rounding to the second significant figure should be sufficient. For example 10,863,000 tonnes at 8.23 per cent should be stated as 11 million tonnes at 8.2 per cent. There will be occasions, however, where rounding to the first significant figure may be necessary in order to convey properly the uncertainties in estimation. This would usually be the case with Inferred Mineral Resources.*

<p><i>an estimate not a calculation.</i></p> <p><i>Competent Persons are encouraged, where appropriate, to discuss the relative accuracy and/or confidence of the Mineral Resource estimates. The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnage or volume. Where a statement of the relative accuracy and/or confidence is not possible, a qualitative discussion of the uncertainties should be provided (refer to Table 1).</i></p> <p>25. Public Reports of Mineral Resources must specify one or more of the categories of ‘Inferred’, ‘Indicated’ and ‘Measured’. Categories must not be reported in a combined form unless details for the individual categories are also provided. Mineral Resources must not be reported in terms of contained metal or mineral content unless corresponding tonnages and grades are also presented. Mineral Resources must not be aggregated with Ore Reserves.</p> <p>Public Reporting of tonnages and grades outside the categories covered by the Code is not permitted unless the situation is covered by Clause 18, and then only in strict accordance with the requirements of that clause.</p>	<p><i>Competent Persons are encouraged, where appropriate, to discuss the relative accuracy and/or confidence of the Mineral Resource estimates <b>with consideration of at least sampling, analytical and estimation errors</b>. The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnage or volume. Where a statement of the relative accuracy and/or confidence is not possible, a qualitative discussion of the uncertainties should be provided in its place (refer to Table 1).</i></p> <p>25. Public Reports of Mineral Resources must specify one or more of the categories of ‘Inferred’, ‘Indicated’ and ‘Measured’. Categories must not be reported in a combined form unless details for the individual categories are also provided. Mineral Resources must not be reported in terms of contained metal or mineral content unless corresponding tonnages and grades are also presented. Mineral Resources must not be aggregated with Ore Reserves.</p> <p>Public Reporting of tonnages and grades outside the categories covered by the Code is not permitted unless the situation is covered by Clause 16, and then only in strict accordance with the requirements of that clause.</p>
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*Estimates of tonnage and grade outside of the categories covered by the Code may be useful for a company in its internal calculations and evaluation processes, but their inclusion in Public Reports could cause confusion.*

26. Table 1 provides, in a summary form, a list of the main criteria which should be considered when preparing reports on Exploration Results, Mineral Resources and Ore Reserves. These criteria need not be discussed in a Public Report unless they materially affect estimation or classification of the Mineral Resources.

*It is not necessary, when publicly reporting, to comment on each item in Table 1, but it is essential to discuss any matters which might materially affect the reader's understanding or interpretation of the results or estimates being reported. This is particularly important where inadequate or uncertain data affect the reliability of, or confidence in, a statement of Exploration Results or an estimate of Mineral Resources or Ore Reserves; for example, poor sample recovery, poor repeatability of assay or laboratory results, limited information on bulk densities etc.*

*Estimates of tonnage and grade outside of the categories covered by the Code may be useful for a company in its internal calculations and evaluation processes, but their inclusion in Public Reports is not permitted.*

26. In a Public Report of a Mineral Resource for a significant project for the first time, or when those estimates have materially changed from when they were last reported, a brief summary of the information elicited under each of the criteria in Table 1 must be provided or, if a particular criterion is not relevant or material, a disclosure that it is not relevant or material and a brief explanation of why this is the case.

*When Mineral Resources are first released or when a material change occurs (including classification changes), there is an increased need for transparent discussion of the basis for the new Mineral Resource estimate in order that investors are appropriately informed of the basis for the changes. As noted in Clause 4 the benchmark of materiality is that which an investor or their advisors would reasonably expect to see explicit comment on from the Competent Person, thus the reporting of all criteria in Table 1 on an 'if not, why not basis' is particularly important. Where there are as yet unresolved issues potentially impacting the reliability of, or confidence in, a statement of Mineral Resources; for example, poor sample recovery, poor repeatability of assay or laboratory results, limited*

<p><i>If there is doubt about what should be reported, it is better to err on the side of providing too much information rather than too little.</i></p> <p><i>Uncertainties in any of the criteria listed in Table 1 that could lead to under- or over- statement of resources should be disclosed.</i></p> <p><i>Mineral Resource estimates are sometimes reported after adjustment from reconciliation with production data. Such adjustments should be clearly stated in a Public Report of Mineral Resources and the nature of the adjustment or modification described.</i></p> <p>27. The words ‘ore’ and ‘reserves’ must not be used in describing Mineral Resource estimates as the terms imply technical feasibility and economic viability and are only appropriate when all relevant Modifying Factors have been considered. Reports and statements should continue to refer to the appropriate category or categories of Mineral Resources until technical feasibility and economic viability have been established. If re-evaluation indicates that the Ore Reserves are no longer viable,</p>	<p><i>information on bulk densities etc. this should be reported also. The Technical summary based against Table 1 criteria should be made available as an appendix to the Public Report.</i></p> <p><i>If there is doubt about what should be reported, it is better to err on the side of providing too much information rather than too little.</i></p> <p><i>Uncertainties in any of the criteria listed in Table 1 that could lead to under- or over- statement of resources should be disclosed.</i></p> <p><i>Mineral Resource estimates are sometimes reported after adjustment from reconciliation with production data. Such adjustments should be clearly stated in a Public Report of Mineral Resources and the nature of the adjustment or modification described.</i></p> <p>27. The words ‘ore’ and ‘reserves’ must not be used in describing Mineral Resource estimates as the terms imply technical feasibility and economic viability and are only appropriate when all relevant Modifying Factors have been considered. Reports and statements should continue to refer to the appropriate category or categories of Mineral Resources until technical feasibility and economic viability have been established. If re-evaluation indicates that the Ore Reserves are no longer viable, the Ore</p>
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the Ore Reserves must be reclassified as Mineral Resources or removed from Mineral Resource/Ore Reserve statements.

*It is not intended that re-classification from Ore Reserves to Mineral Resources or vice versa should be applied as a result of changes expected to be of a short term or temporary nature, or where company management has made a deliberate decision to operate on a non-economic basis. Examples of such situations might be commodity price fluctuations expected to be of short duration, mine emergency of a non-permanent nature, transport strike etc.*

Reserves must be reclassified as Mineral Resources or removed from Mineral Resource/Ore Reserve statements.

*It is not intended that re-classification from Ore Reserves to Mineral Resources or vice versa should be applied as a result of changes expected to be of a short term or temporary nature, or where company management has made a deliberate decision to operate on a non-economic basis. Examples of such situations might be commodity price fluctuations expected to be of short duration, mine emergency of a non-permanent nature, transport strike etc.*

Reporting of Ore Reserves	Reporting of Ore Reserves
<p>28. An ‘Ore Reserve’ is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified. Ore Reserves are sub-divided in order of increasing confidence into Probable Ore Reserves and Proved Ore Reserves.</p> <p>In reporting Ore Reserves, information on estimated mineral processing recovery factors is very important, and should always be included in Public Reports.</p> <p><i>Ore Reserves are those portions of Mineral Resources which, after the application of all mining factors, result in an estimated tonnage and grade which, in the opinion of</i></p>	<p>28. An 'Ore Reserve' is the economically mineable part of a Measured and/or Indicated Mineral Resource.</p> <p>It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors.</p> <p>Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The key underlying assumptions and outcomes of the Pre-Feasibility Study or Feasibility Study must be disclosed at the time of reporting of a new or materially changed Ore Reserve.</p> <p>Pre-feasibility and Feasibility studies are defined in Paragraphs 36 and 37 below.</p> <p>Ore Reserves are sub-divided in order of increasing confidence into Probable and Proved.</p> <p>In reporting Ore Reserves, information on estimated mineral processing recovery factors is very important, and should always be included in Public Reports.</p> <p><i>Ore Reserves are those portions of Mineral Resources which, after the application of all Modifying Factors, result in an estimated tonnage and grade which, in the opinion of the</i></p>



*the Competent Person making the estimates, can be the basis of a viable project, after taking account of all relevant Modifying Factors.*

*Ore Reserves are reported as inclusive of marginally economic material and diluting material delivered for treatment or dispatched from the mine without treatment.*

*The term 'economically mineable' implies that extraction of the Ore Reserve has been demonstrated to be viable under reasonable financial assumptions. What constitutes the term 'realistically assumed' will vary with the type of deposit, the level of study that has been carried out and the financial criteria of the individual company. For this reason, there can be no fixed definition for the term 'economically mineable'.*

*In order to achieve the required level of confidence in the Modifying Factors, appropriate studies will have been carried out prior to determination of the Ore Reserves. The studies will have determined a mine plan that is technically achievable and economically viable and from which the Ore Reserves can be derived. It may not be necessary for these studies to be at the level of a final feasibility study.*

*The term 'Ore Reserve' need not necessarily signify that extraction facilities are in place or operative, or that all*

*Competent Person making the estimates, can be the basis of a viable project, after taking account of all relevant Modifying Factors.*

*Ore Reserves are reported as inclusive of marginally economic material and diluting material delivered for treatment or dispatched from the mine without treatment.*

*The term 'economically mineable' implies that extraction of the Ore Reserves has been demonstrated to be viable under reasonable financial assumptions. What constitutes the term 'realistically assumed' will vary with the type of deposit, the level of study that has been carried out and the financial criteria of the individual company. For this reason, there can be no fixed definition for the term 'economically mineable'.*

*In order to achieve the required level of confidence in the Modifying Factors, appropriate Feasibility or Pre-Feasibility level studies will have been carried out prior to determination of the Ore Reserves. The studies will have determined a mine plan that is technically achievable and economically viable and from which the Ore Reserves can be derived.*

*The term 'Ore Reserves' need not necessarily signify that extraction facilities are in place or operative, or that all necessary approvals or sales contracts have been received. It does signify*

*necessary approvals or sales contracts have been received. It does signify that there are reasonable expectations of such approvals or contracts. The Competent Person should consider the materiality of any unresolved matter that is dependent on a third party on which extraction is contingent.*

*If there is doubt about what should be reported, it is better to err on the side of providing too much information rather than too little.*

*Any adjustment made to the data for the purpose of making the Ore Reserve estimate, for example by cutting or factoring grades, should be clearly stated and described in the Public Report.*

*Where companies prefer to use the term ‘Mineral Reserves’ in their Public Reports, e.g. for reporting industrial minerals or for reporting outside Australasia, they should state clearly that this is being used with the same meaning as ‘Ore Reserves’, defined in this Code. If preferred by the reporting company, ‘Ore Reserve’ and ‘Mineral Resource’ estimates for coal may be reported as ‘Coal Reserve’ and ‘Coal Resource’ estimates.*

JORC prefers the term ‘Ore Reserve’ because it assists in

*that there are reasonable grounds to expect that such approvals or contracts will eventuate within the anticipated timeframe required by the mine plans. There must be reasonable grounds to expect that all necessary Government approvals will be received. The Competent Person should highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction is contingent.*

*If there is doubt about what should be reported, it is better to err on the side of providing too much information rather than too little.*

*Any adjustment made to the data for the purpose of making the Ore Reserve estimate, for example by cutting or factoring grades, should be clearly stated and described in the Public Report.*

*Where companies prefer to use the term ‘Mineral Reserves’ in their Public Reports, e.g. for reporting industrial minerals or for reporting outside Australasia, they should state clearly that this is being used with the same meaning as ‘Ore Reserves’, defined in this Code. If preferred by the reporting company, ‘Ore Reserve’ and ‘Mineral Resource’ estimates for coal may be reported as ‘Coal Reserve’ and ‘Coal Resource’ estimates.*

*JORC prefers the term ‘Ore Reserve’ because it assists in maintaining a clear distinction between a ‘Mineral Resource’ and an ‘Ore Reserve’, whereas other codes feel it is better to reference Mineral Exploration Results, Mineral Resources and*

<p>maintaining a clear distinction between a ‘Mineral Resource’ and an ‘Ore Reserve’.</p> <p>29. <b>A ‘Probable Ore Reserve’ is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified.</b></p> <p>A Probable Ore Reserve has a lower level of confidence than a Proved Ore Reserve but is of sufficient quality to serve as the basis for a decision on the development of the deposit.</p> <p>30. <b>A ‘Proved Ore Reserve’ is the economically mineable part of a Measured Mineral Resource. It includes diluting materials and allowances for losses which may occur when the material is mined. Appropriate assessments and studies have been carried out, and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of</b></p>	<p><i>Mineral Reserves.</i></p> <p>29. <b>A ‘Probable Ore Reserve’ is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource.</b></p> <p><b>The confidence in the Modifying Factors applying to a Probable Ore Reserve is lower than that applying to a Proved Ore Reserve.</b></p> <p>A Probable Ore Reserve has a lower level of confidence than a Proved Ore Reserve but is of sufficient quality to serve as the basis for a decision on the development of the deposit.</p> <p>30. <b>A Proved Ore Reserve’ is the economically mineable part of a Measured Mineral Resource.</b></p> <p><b>A Proved Ore Reserve implies a high degree of confidence in the Modifying Factors.</b></p>
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**reporting that extraction could reasonably be justified.**

*A Proved Ore Reserve represents the highest confidence category of reserve estimate. The style of mineralisation or other factors could mean that Proved Ore Reserves are not achievable in some deposits.*

31. The choice of the appropriate category of Ore Reserve is determined primarily by the relevant level of confidence in the Mineral Resource and after considering any uncertainties in the Modifying Factors. Allocation of the appropriate category must be made by a Competent Person or Persons.

*The Code provides for a direct two-way relationship between Indicated Mineral Resources and Probable Ore Reserves and between Measured Mineral Resources and Proved Ore Reserves. In other words, the level of geological confidence for Probable Ore Reserves is similar to that required for the determination of Indicated Mineral Resources, and the level of geological confidence for Proved Ore Reserves is similar to that required for the determination of Measured Mineral Resources.*

*The Code also provides for a two-way relationship between Measured Mineral Resources and Probable Ore Reserves. This is to cover a situation where uncertainties*

*A Proved Ore Reserve represents the highest confidence category of reserve estimate.*

*The style of mineralisation or other factors could mean that Proved Ore Reserves are not achievable in some deposits.*

31. The choice of the appropriate category of Ore Reserve is determined primarily by the relevant level of confidence in the Mineral Resource and after considering any uncertainties in the Modifying Factors. Allocation of the appropriate category must be made by a Competent Person or Persons.

*The Code provides for a direct two-way relationship between Indicated Mineral Resources and Probable Ore Reserves and between Measured Mineral Resources and Proved Ore Reserves. In other words, the level of geological confidence for Probable Ore Reserves is similar to that required for the determination of Indicated Mineral Resources, and the level of geological confidence for Proved Ore Reserves is similar to that required for the determination of Measured Mineral Resources.*

*The Code also provides for a two-way relationship between Measured Mineral Resources and Probable Ore Reserves. This is to cover a situation where uncertainties associated with any of the Modifying Factors considered when*

*associated with any of the Modifying Factors considered when converting Mineral Resources to Ore Reserves may result in there being a lower degree of confidence in the Ore Reserves than in the corresponding Mineral Resources. Such a conversion would not imply a reduction in the level of geological knowledge or confidence.*

*A Probable Ore Reserve derived from a Measured Mineral Resource may be converted to a Proved Ore Reserve if the uncertainties in the Modifying Factors are removed. No amount of confidence in the Modifying Factors for conversion of a Mineral Resource to an Ore Reserve can override the upper level of confidence that exists in the Mineral Resource. Under no circumstances can an Indicated Mineral Resource be converted directly to a Proved Ore Reserve (see Figure 1).*

*Application of the category of Proved Ore Reserve implies the highest degree of confidence in the estimate, with consequent expectations in the minds of the readers of the report. These expectations should be borne in mind when categorising a Mineral Resource as Measured.*

*Refer also to the guidelines in Clause 23 regarding classification of Mineral Resources.*

*converting Mineral Resources to Ore Reserves may result in there being a lower degree of confidence in the Ore Reserves than in the corresponding Mineral Resources. Such a conversion would not imply a reduction in the level of geological knowledge or confidence.*

*A Probable Ore Reserve derived from a Measured Mineral Resource may be converted to a Proved Ore Reserve if the uncertainties in the Modifying Factors are removed. No amount of confidence in the Modifying Factors for conversion of a Mineral Resource to an Ore Reserve can override the upper level of confidence that exists in the Mineral Resource. Under no circumstances can an Indicated Mineral Resource be converted directly to a Proved Ore Reserve (see Figure 1).*

*Application of the category of Proved Ore Reserve implies the highest degree of confidence in the estimate, with consequent expectations in the minds of the readers of the report. These expectations should be **considered when** categorising a Mineral Resource as Measured.*

*Refer also to the guidelines in Clause 23 regarding classification of Mineral Resources.*

32. Ore Reserve estimates are not precise calculations. Reporting of tonnage and grade figures should reflect the relative uncertainty of the estimate by rounding off to appropriately significant figures. Refer also to Clause 24.

*To emphasise the imprecise nature of an Ore Reserve, the final result should always be referred to as an estimate not a calculation.*

*Competent Persons are encouraged, where appropriate, to discuss the relative accuracy and/or confidence of the Ore Reserve estimates. The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnage or volume. Where a statement of the relative accuracy and/or confidence is not possible, a qualitative discussion of the uncertainties should be provided (refer to Table 1).*

33. Public Reports of Ore Reserves must specify one or other or both of the categories of ‘Proved’ and ‘Probable’. Reports must not contain combined Proved and Probable Ore Reserve figures unless the relevant figures for each of the categories are also provided. Reports must not present metal or mineral content figures unless corresponding tonnage and grade figures are also given.

32. Ore Reserve estimates are not precise calculations. Reporting of tonnage and grade figures should reflect the relative uncertainty of the estimate by rounding off to appropriately significant figures. Refer also to Clause 24.

*To emphasise the imprecise nature of an Ore Reserve, the final result should always be referred to as an estimate not a calculation.*

*Competent Persons are encouraged, where appropriate, to discuss the relative accuracy and/or confidence of the Ore Reserve estimates with consideration of both underlying estimation and Modifying factor uncertainties. The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnage or volume. Where a statement of the relative accuracy and/or confidence is not possible, a qualitative discussion of the uncertainties should be provided in its place (refer to Table 1).*

33. Public Reports of Ore Reserves must specify one or other or both of the categories of ‘Proved’ and ‘Probable’. Reports must not contain combined Proved and Probable Ore Reserve figures unless the relevant figures for each of the categories are also provided. Reports must not present metal or mineral content figures unless corresponding tonnage and grade figures are also given.

Public Reporting of tonnage and grade outside the categories covered by the Code is not permitted unless the situation is covered by Clause 18, and then only in strict accordance with the requirements of that clause.

*Estimates of tonnage and grade outside of the categories covered by the Code may be useful for a company in its internal calculations and evaluation processes, but their inclusion in Public Reports could cause confusion.*

*Ore Reserves may incorporate material (dilution) which is not part of the original Mineral Resource. It is essential that this fundamental difference between Mineral Resources and Ore Reserves is borne in mind and caution exercised if attempting to draw conclusions from a comparison of the two.*

*When revised Ore Reserve and Mineral Resource statements are publicly reported they should be accompanied by reconciliation with previous statements. A detailed account of differences between the figures is not essential, but sufficient comment should be made to enable significant changes to be understood by the reader.*

Public Reporting of tonnage and grade outside the categories covered by the Code is not permitted unless the situation is covered by Clause 16, and then only in strict accordance with the requirements of that clause.

*Estimates of tonnage and grade outside of the categories covered by the Code may be useful for a company in its internal calculations and evaluation processes, but their inclusion in Public Reports could cause confusion, and is not permitted.*

*Ore Reserves may incorporate material (dilution) which is not part of the original Mineral Resource. It is essential that this fundamental difference between Mineral Resources and Ore Reserves is considered and caution exercised if attempting to draw conclusions from a comparison of the two.*

*When revised Ore Reserve and Mineral Resource statements are publicly reported, the Company must discuss any material changes from the previous estimate, and supply sufficient comment to enable the basis for significant changes to be understood by the reader.*

*New clause order → clauses 34 and 35 reversed in this column to assist comparison*

35. Table 1 provides, in a summary form, a list of the criteria which should be considered when preparing reports on Exploration Results, Mineral Resources and Ore Reserves. These criteria need not be discussed in a Public Report unless they materially affect estimation or classification of the Ore Reserves. Changes in economic or political factors alone may be the basis for significant changes in Ore Reserves and should be reported accordingly.

*Ore Reserve estimates are sometimes reported after adjustment from reconciliation with production data. Such adjustments should be clearly stated in a Public Report of Ore Reserves and the nature of the adjustment or modification described.*

34. In a Public Report of an Ore Reserve estimate for a significant project for the first time, or when those estimates have materially changed from when they were last reported, a brief summary of the information and Modifying Factors elicited under each of the criteria in Table 1 must be provided or, if a particular criterion is not relevant or material, a disclosure that it is not relevant or material and a brief explanation of why this is the case.

*When Ore Reserves are first released or when a material change occurs (including classification changes), there is an increased need for transparent discussion of the basis for the new Ore Reserve estimate in order that investors are appropriately informed of the basis for the changes. As noted in Clause 4 the benchmark of materiality is that which an investor or their advisors would reasonably expect to see explicit comment on from the Competent Person, thus the reporting of all criteria in Table 1 on an ‘if not, why not basis’ is particularly important. Where there are as yet unresolved issues potentially impacting the reliability of, or confidence in, a statement of Ore Reserves; for example, limited geotechnical information, complex orebody metallurgy, uncertainty in the permitting process etc. this should be reported also.*

*The Technical summary based against Table 1 criteria should be made available as an appendix to the Public*



<p style="text-align: center;"><b><i>Clauses 34 and 35 in reversed in this column to assist comparison.</i></b></p> <p>34. In situations where figures for both Mineral Resources and Ore Reserves are reported, a statement must be included in the report which clearly indicates whether the Mineral Resources are inclusive of, or additional to the Ore Reserves.</p> <p>Ore Reserve estimates must not be aggregated with Mineral Resource estimates to report a single combined figure.</p> <p><i>In some situations there are reasons for reporting Mineral Resources inclusive of Ore Reserves and in other situations for reporting Mineral Resources additional to Ore Reserves. It must be made clear which form of reporting has been adopted. Appropriate forms of clarifying statements may be:</i></p>	<p><i>Report.</i></p> <p><i>If there is doubt about what should be reported, it is better to err on the side of providing too much information rather than too little. Uncertainties in any of the criteria listed in Table 1 that could lead to under- or over- statement of Ore Reserves should be disclosed.</i></p> <p><i>Ore Reserve estimates are sometimes reported after adjustment from reconciliation with production data. Such adjustments should be clearly stated in a Public Report of Ore Reserves and the nature of the adjustment or modification described.</i></p> <p>35. In situations where figures for both Mineral Resources and Ore Reserves are reported, a statement must be included in the report which clearly indicates whether the Mineral Resources are inclusive of, or additional to the Ore Reserves.</p> <p>Ore Reserve estimates must not be aggregated with Mineral Resource estimates to report a single combined figure.</p> <p><i>In some situations there are reasons for reporting Mineral Resources inclusive of Ore Reserves and in other situations for reporting Mineral Resources additional to Ore Reserves. It must be made clear which form of reporting has been adopted. Appropriate forms of clarifying statements may be:</i></p> <p><i>'The Measured and Indicated Mineral Resources are</i></p>
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*‘The Measured and Indicated Mineral Resources are inclusive of those Mineral Resources modified to produce the Ore Reserves.’ or*

*‘The Measured and Indicated Mineral Resources are additional to the Ore Reserves.’*

*In the former case, if any Measured and Indicated Mineral Resources have not been modified to produce Ore Reserves for economic or other reasons, the relevant details of these unmodified Mineral Resources should be included in the report. This is to assist the reader of the report in making a judgement of the likelihood of the unmodified Measured and Indicated Mineral Resources eventually being converted to Ore Reserves.*

*Inferred Mineral Resources are by definition always additional to Ore Reserves.*

*For reasons stated in the guidelines to Clause 33 and in this paragraph, the reported Ore Reserve figures must not be aggregated with the reported Mineral Resource figures. The resulting total is misleading and is capable of being misunderstood or of being misused to give a false impression of a company’s prospects.*

*inclusive of those Mineral Resources modified to produce the Ore Reserves.’ or*

*‘The Measured and Indicated Mineral Resources are additional to the Ore Reserves.’*

*In the former case, if any Measured and Indicated Mineral Resources have not been modified to produce Ore Reserves for economic or other reasons, the relevant details of these unmodified Mineral Resources should be included in the report. This is to assist the reader of the report in making a judgement of the likelihood of the unmodified Measured and Indicated Mineral Resources eventually being converted to Ore Reserves.*

*Inferred Mineral Resources are by definition always additional to Ore Reserves.*

*For reasons stated in the guidelines to Clause 33 and in this paragraph, the reported Ore Reserve figures must not be aggregated with the reported Mineral Resource figures (e.g. in graphs, figures or tables). The resulting total is misleading and is capable of being misunderstood or of being misused to give a false impression of a company’s prospects.*

<p><i>New clause added →</i></p>	<p>36 <b>Scoping Study:</b> A Scoping Study is a study, other than a Pre-Feasibility or Feasibility study, that includes an economic analysis of the potential viability of mineral resources. It is a low level technical and economic study that includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate at the time of reporting that progress to a Pre-Feasibility Study can be reasonably justified.</p> <p>If a Scoping Study is partially supported by Inferred Mineral Resources, an entity must declare what proportion of the Scoping Study is supported by Inferred Resources. For all Scoping Studies, the entity must also include a cautionary statement in the same paragraph as, or immediately following, the disclosure of the Scoping Study.</p> <p><i>“The Scoping Study referred to in this report is based on low level technical and economic assessments, and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage , or to provide certainty that the conclusions of the Scoping Study will be realized. ”</i></p>
<p><i>New clause added →</i></p>	<p>37 <b>Preliminary Feasibility Study (Pre-Feasibility Study):</b> A Preliminary Feasibility Study is a comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an</p>

*New clause →*

open pit, is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions on the **Modifying Factors** and the evaluation of any other relevant factors which are sufficient for a **Competent Person**, acting reasonably, to determine if all or part of the **Mineral Resource** may be converted to a **Ore Reserve at the time of reporting**. A **Pre-feasibility Study** is at a lower confidence level than a **Feasibility Study**.

38 A **Feasibility Study** is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable **Modifying Factors** together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that extraction is reasonably justified (economically mineable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project. The confidence level of the study will be higher than that of a **Pre-Feasibility Study**.

The Code does not require that a full Feasibility Study has been undertaken to convert Mineral Resources to Ore Reserves, but it does require that at least a Pre-Feasibility Study will have been carried out that will have determined a mine plan that is technically achievable and economically viable, and that all Modifying Factors have been considered.

**Reporting of Mineralised Fill, Remnants, Pillars, Low Grade Mineralisation, Stockpiles, Dumps and Tailings**

36. The Code applies to the reporting of all potentially economic mineralised material. This can include mineralised fill, remnants, pillars, low grade mineralisation, stockpiles, dumps and tailings (remnant materials) where there are reasonable prospects for eventual economic extraction in the case of Mineral Resources, and where extraction is reasonably justifiable in the case of Ore Reserves. Unless otherwise stated, all other clauses of the Code (including Figure 1) apply.

*Any mineralised material as described in this clause can be considered to be similar to in situ mineralisation for the purposes of reporting Mineral Resources and Ore Reserves. Judgements about the mineability of such mineralised material should be made by professionals with relevant experience.*

*If there are no reasonable prospects for the eventual economic extraction of all or part of the mineralised material as described in this clause, then this material cannot be classified as either Mineral Resources or Ore Reserves. If some portion of the mineralised material is currently sub-economic, but there is a reasonable expectation that it will become economic, then this*

**Reporting of Mineralised Fill, Remnants, Pillars, Low Grade Mineralisation, Stockpiles, Dumps and Tailings**

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*If there are no reasonable prospects for the eventual economic extraction of all or part of the mineralised material as described in this clause, then this material cannot be classified as either Mineral Resources or Ore Reserves. If some portion of the mineralised material is currently sub-economic, but there is a reasonable expectation that it will become economic, then this material*

*material may be classified as a Mineral Resource. If technical and economic studies have demonstrated that economic extraction could reasonably be justified under realistically assumed conditions, then the material may be classified as an Ore Reserve.*

*The above guidelines apply equally to low grade in situ mineralisation, sometimes referred to as ‘mineralised waste’ or ‘marginal grade material’, and often intended for stockpiling and treatment towards the end of mine life. For clarity of understanding, it is recommended that tonnage and grade estimates of such material be itemised separately in Public Reports, although they may be aggregated with total Mineral Resource and Ore Reserve figures.*

*Stockpiles are defined to include both surface and underground stockpiles, including broken ore in stopes, and can include ore currently in the ore storage system. Mineralised material in the course of being processed (including leaching), if reported, should be reported separately.*

*may be classified as a Mineral Resource. If technical and economic studies have demonstrated that economic extraction could reasonably be justified under realistically assumed conditions, then the material may be classified as an Ore Reserve.*

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*Stockpiles are defined to include both surface and underground stockpiles, including broken ore in stopes, and can include ore currently in the ore storage system. Mineralised material in the course of being processed (including leaching), if reported, should be reported separately.*

## Reporting of Coal Resources and Reserves

37. Clauses 37 to 39 of the Code address matters that relate specifically to the Public Reporting of Coal Resources and Reserves. Unless otherwise stated, Clauses 1 to 36 of this Code (including Figure 1) apply. Table 1, as part of the guidelines, should be considered persuasive when reporting on Coal Resources and Reserves.

*For purposes of Public Reporting, the requirements for coal are generally similar to those for other commodities with the replacement of terms such as ‘mineral’ by ‘coal’ and ‘grade’ by ‘quality’.*

*For guidance on the estimation of Coal Resources and Reserves and on statutory reporting not primarily intended for providing information to the investing public, readers are referred to the 2003 edition of the ‘Australian Guidelines for Estimating and Reporting of Inventory Coal, Coal Resources and Coal Reserves’. These guidelines do not override the provisions and intentions of the JORC Code for Public Reporting.*

*Because of its impact on planning and land use, governments may require estimates of inventory coal that are not constrained by short to medium term economic considerations. The JORC Code does not cover such*

## Reporting of Coal Resources and Reserves

40 **Clauses 40 to 43** of the Code address matters that relate specifically to the Public Reporting of Coal Resources and Reserves. Unless otherwise stated, Clauses 1 to **39** of this Code (including Figure 1) apply. Table 1, as part of the guidelines, should be considered persuasive when reporting on Coal Resources and Reserves.

*For purposes of Public Reporting, the requirements for coal are generally similar to those for other commodities with the replacement of terms such as ‘mineral’ by ‘coal’ and ‘grade’ by ‘quality’.*

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*Because of its impact on planning and land use, governments may require estimates of inventory coal that are not constrained by short to medium term economic considerations. The JORC Code does not cover such*

<p style="text-align: center;"><i>estimates. Refer also to the guidelines to Clauses 5 and 19.</i></p> <p>38. The terms ‘Mineral Resource(s)’ and ‘Ore Reserve(s)’, and the subdivisions of these as defined above, apply also to coal reporting, but if preferred by the reporting company, the terms ‘Coal Resource(s)’ and ‘Coal Reserve(s)’ and the appropriate subdivisions may be substituted.</p> <p>39. ‘Marketable Coal Reserves’, representing beneficiated or otherwise enhanced coal product where modifications due to mining, dilution and processing have been considered, may be publicly reported in conjunction with, but not instead of, reports of Ore (Coal) Reserves. The basis of the predicted yield to achieve Marketable Coal Reserves should be stated.</p>	<p style="text-align: center;"><i>estimates. Refer also to the guidelines to Clauses 5 and 19.</i></p> <p>41 The terms ‘Mineral Resource(s)’ and ‘Ore Reserve(s)’, and the subdivisions of these as defined above, apply also to coal reporting, but if preferred by the reporting company, the terms ‘Coal Resource(s)’ and ‘Coal Reserve(s)’ and the appropriate subdivisions may be substituted.</p> <p>42 Coal Resources relating to seams of a nature that require significant beneficiation to achieve a marketable product(s) must also include a disclosure of anticipated yield estimates and a discussion of the expected process or mining losses.</p> <p>43 ‘Marketable Coal Reserves’, representing beneficiated or otherwise enhanced coal product where modifications due to mining, dilution and processing have been considered, may be publicly reported in conjunction with, but not instead of, reports of Coal Reserves. The basis of the predicted yield to achieve Marketable Coal Reserves should be stated.</p> <p style="text-align: center;"><i>Since investors need to be informed on the products intended to be sold, reporting of Marketable Coal Reserves is encouraged.</i></p>
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## Reporting of Diamond Exploration Results, Mineral Resources and Ore Reserves

40. Clauses 40 to 43 of the Code address matters that relate specifically to the Public Reporting of Exploration Results, Mineral Resources and Ore Reserves for diamonds and other gemstones. Unless otherwise stated, Clauses 1 to 36 of this Code (including Figure 1) apply. Table 1, as part of the guidelines, should be considered persuasive when reporting Exploration Results, Mineral Resources and Ore Reserves for diamonds and other gemstones.

*For the purposes of Public Reporting, the requirements for diamonds and other gemstones are generally similar to those for other commodities with the replacement of terms such as 'mineral' by 'diamond' and 'grade' by 'grade and average diamond value'. The term 'quality' should not be substituted for 'grade,' since in diamond deposits these have distinctly separate meanings. Other industry guidelines on the estimation and reporting of diamond resources and reserves may be useful but will not under any circumstances override the provisions and intentions of the JORC Code.*

*A number of characteristics of diamond deposits are different from those of, for example, typical metalliferous and coal deposits and therefore require special consideration. These include the generally low mineral content and variability of primary and placer deposits, the particulate nature of*

## Reporting of Diamond Exploration Results, Mineral Resources and Ore Reserves

44 Clauses 44 to 47 of the Code address matters that relate specifically to the Public Reporting of Exploration Results, Mineral Resources and Ore Reserves for diamonds and other gemstones. Unless otherwise stated, Clauses 1 to 39 of this Code (including Figure 1) apply. Table 1, as part of the guidelines, should be considered persuasive when reporting Exploration Results, Mineral Resources and Ore Reserves for diamonds and other gemstones.

*For the purposes of Public Reporting, the requirements for diamonds and other gemstones are generally similar to those for other commodities with the replacement of terms such as 'mineral' by 'diamond' and 'grade' by 'grade and average diamond value'. The term 'quality' should not be substituted for 'grade,' since in diamond deposits these have distinctly separate meanings. Other industry guidelines on the estimation and reporting of diamond resources and reserves may be useful but will not under any circumstances override the provisions and intentions of the JORC Code.*

*A number of characteristics of diamond deposits are different from those of, for example, typical metalliferous and coal deposits and therefore require special consideration. These include the generally low mineral content and variability of primary and placer deposits, the particulate nature of diamonds,*

*diamonds, the specialised requirement for diamond valuation and the inherent difficulties and uncertainties in the estimation of diamond resources and reserves.*

41. Reports of diamonds recovered from sampling programs must provide material information relating to the basis on which the sample is taken, the method of recovery and the recovery of the diamonds. The weight of diamonds recovered may only be omitted from the report when the diamonds are considered to be too small to be of commercial significance. This lower cut-off size should be stated.

*The stone size distribution and price of diamonds and other gemstones are critical components of the resource and reserve estimates. At an early exploration stage, sampling and delineation drilling will not usually provide this information, which relies on large diameter drilling and, in particular, bulk sampling.*

*In order to demonstrate that a resource has reasonable prospects for economic extraction, some appreciation of the likely stone size distribution and price is necessary, however preliminary. To determine an Inferred Resource in simple, single-facies or single-phase deposits, such*

*the specialised requirement for diamond valuation and the inherent difficulties and uncertainties in the estimation of diamond resources and reserves.*

- 45 Reports of diamonds recovered from sampling programs must provide material information relating to the basis on which the sample is taken, the method of recovery and the recovery of the diamonds. The weight of diamonds recovered may only be omitted from the report when the diamonds are considered to be too small to be of commercial significance. This lower cut-off size should be stated.

*The stone size distribution and price of diamonds and other gemstones are critical components of the resource and reserve estimates. At an early exploration stage, sampling and delineation drilling will not usually provide this information, which relies on large diameter drilling and, in particular, bulk sampling.*

*In order to demonstrate that a resource has reasonable prospects for economic extraction, some appreciation of the likely stone size distribution and price is necessary, however preliminary. To determine an Inferred Resource in simple, single-facies or single-phase deposits, such information may be obtainable by representative large diameter drilling.*

*information may be obtainable by representative large diameter drilling. More often, some form of bulk sampling, such as pitting and trenching, would be employed to provide larger sample parcels.*

*In order to progress to an Indicated Resource, and from there to a Probable Reserve, it is likely that much more extensive bulk sampling would be needed to fully determine the stone size distribution and value. Commonly such bulk samples would be obtained by underground development designed to obtain sufficient diamonds to enable a confident estimate of price.*

*In complex deposits, it may be very difficult to ensure that the bulk samples taken are truly representative of the whole deposit. The lack of direct bulk sampling, and the uncertainty in demonstrating spatial continuity of size and price relationships should be persuasive in determining the appropriate resource category.*

42. Where diamond Mineral Resource or Ore Reserve grades (carats per tonne) are based on correlations between the frequency of occurrence of micro-diamonds and of commercial size stones, this must be stated, the reliability of the procedure must be explained and the cut-off sieve size for micro-diamonds reported.

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- 46 Where diamond Mineral Resource or Ore Reserve grades (carats per tonne) are based on correlations between the frequency of occurrence of micro-diamonds and of commercial size stones, this must be stated, the reliability of the procedure must be explained and the cut-off sieve size for micro-diamonds reported.

<p>43. For Public Reports dealing with diamond or other gemstone mineralisation, it is a requirement that any reported valuation of a parcel of diamonds or gemstones be accompanied by a statement verifying the independence of the valuation. The valuation must be based on a report from a demonstrably reputable and qualified expert.</p> <p>If a valuation of a parcel of diamonds is reported, the weight in carats and the lower cut-off size of the contained diamonds must be stated and the value of the diamonds must be given in US dollars per carat. Where the valuation is used in the estimation of diamond Mineral Resources or Ore Reserves, the valuation must be based on a parcel representative of the size, shape and colour distributions of the diamond population in the deposit.</p> <p>Diamond valuations should not be reported for samples of diamonds processed using total liberation methods.</p> <p><i>Table 1 provides in summary form, a list of the main criteria which should be considered when preparing reports on Exploration Results, Mineral Resources and Ore Reserves for diamonds and other gemstones.</i></p>	<p>47 For Public Reports dealing with diamond or other gemstone mineralisation, it is a requirement that any reported valuation of a parcel of diamonds or gemstones be accompanied by a statement verifying the independence of the valuation. The valuation must be based on a report from a demonstrably reputable and qualified expert.</p> <p>If a valuation of a parcel of diamonds is reported, the weight in carats and the lower cut-off size of the contained diamonds must be stated and the value of the diamonds must be given in US dollars per carat. Where the valuation is used in the estimation of diamond Mineral Resources or Ore Reserves, the valuation must be based on a parcel representative of the size, shape and colour distributions of the diamond population in the deposit.</p> <p>Diamond valuations should not be reported for samples of diamonds processed using total liberation methods.</p> <p><i>Table 1 provides in summary form, a list of the main criteria which should be considered when preparing reports on Exploration Results, Mineral Resources and Ore Reserves for diamonds and other gemstones.</i></p>
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## Reporting of Industrial Minerals Exploration Results, Mineral Resources and Ore Reserves

44. Industrial minerals are covered by the JORC Code if they meet the criteria set out in Clauses 5 and 6 of the Code. For the purpose of the JORC Code, industrial minerals can be considered to cover commodities such as kaolin, phosphate, limestone, talc etc.

*When reporting information and estimates for industrial minerals, the key principles and purpose of the JORC Code apply and should be borne in mind. Assays may not always be relevant, and other quality criteria may be more applicable. If criteria such as deleterious minerals or physical properties are of more relevance than the composition of the bulk mineral itself, then they should be reported accordingly.*

*The factors underpinning the estimation of Mineral Resources and Ore Reserves for industrial minerals are the same as those for other deposit types covered by the JORC Code. It may be necessary, prior to the reporting of a Mineral Resource or Ore Reserve, to take particular account of certain key characteristics or qualities such as likely product specifications, proximity to markets and general product marketability.*

## Reporting of Industrial Minerals Exploration Results, Mineral Resources and Ore Reserves

48. Industrial minerals are covered by the JORC Code if they meet the criteria set out in Clauses 5 and 6 of the Code. For the purpose of the JORC Code, industrial minerals can be considered to cover commodities such as kaolin, phosphate, limestone, talc etc.

*For minerals that are defined by a specification, the Mineral Resource or Ore Reserve estimation must be reported in terms of the mineral or minerals on which the project is to be based and must include the specification of those minerals.*

*When reporting information and estimates for industrial minerals, the key principles and purpose of the JORC Code apply and should be borne in mind. Assays may not always be relevant, and other quality criteria may be more applicable. If criteria such as deleterious minerals or physical properties are of more relevance than the composition of the bulk mineral itself, then they should be reported accordingly.*

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*For some industrial minerals, it is common practice to report the saleable product rather than the ‘as-mined’ product, which is traditionally regarded as the Ore Reserve. JORC’s preference is that, if the saleable product is reported, it should be in conjunction with, not instead of, reporting of the Ore Reserve. However, it is recognised that commercial sensitivities may not always permit this preferred style of reporting. It is important that, in all situations where the saleable product is reported, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.*

*Some industrial mineral deposits may be capable of yielding products suitable for more than one application and/or specification. If considered material by the reporting company, such multiple products should be quantified either separately or as a percentage of the bulk deposit.*

***New clause →***

*or qualities such as likely product specifications, proximity to markets and general product marketability.*

*For some industrial minerals, it is common practice to report the saleable product rather than the ‘as-mined’ product, which is traditionally regarded as the Ore Reserve. JORC’s preference is that, if the saleable product is reported, it should be in conjunction with, not instead of, reporting of the Ore Reserve. However, it is recognised that commercial sensitivities may not always permit this preferred style of reporting. It is important that, in all situations where the saleable product is reported, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.*

*Some industrial mineral deposits may be capable of yielding products suitable for more than one application and/or specification. If considered material by the reporting company, such multiple products should be quantified either separately or as a percentage of the bulk deposit.*

## **Reporting of Metal Equivalents**

- 49. The reporting of Exploration Results, Mineral Resources or Ore Reserves for polymetallic deposits in terms of metal equivalents (a single equivalent grade of one major metal) may be misleading unless additional details such as estimates of metal recoverability are also provided.**

	<p>Metal Equivalents must only be quoted under the following guidelines to ensure that material transparent information is reported.</p> <p>The assumptions used for any reporting of metal equivalent values must be clearly stated. The reporting of metal equivalents must also adhere to the principles of Transparency, Materiality and Competence, as set out in Clause 4.</p> <p>The following minimum information must accompany any report that includes reference to metal equivalents, in order to conform with these principles:</p> <ul style="list-style-type: none"> <li>• individual grades for all metals included in the metal equivalent calculation;</li> <li>• assumed commodity prices for all metals. (Companies should disclose the actual assumed prices. It is not sufficient to refer to a spot price without disclosing the price used in calculating the metal equivalent);</li> <li>• assumed metallurgical recoveries for all metals and discussion of the basis on which the assumed recoveries are derived (metallurgical test work, detailed mineralogy, similar deposits, etc.);</li> <li>• a clear statement that it is the company's opinion that all the elements included in the metal equivalents calculation have a reasonable potential to be recovered; and,</li> </ul>
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- the calculation formula used.

In most circumstances, the metal chosen for reporting on an equivalent basis should be the one that contributes most to the metal equivalent calculation. If this is not the case, a clear explanation of the logic of choosing another metal must be included in the report.

Estimates of metallurgical recoveries for each metal are particularly important to calculate meaningful metal equivalents.

For many projects at the Exploration Results stage, metallurgical recovery information may not be available or able to be estimated with reasonable confidence. In such cases reporting on the basis of metal equivalents is not appropriate.

*New clause →*

### **Reporting of In Situ or In-Ground Values**

50. The publication of '*in-situ*' or 'in-ground values' breaches the principles of the Code (Clause 4) as the use of these terms is not transparent and lacks material information. It is also contrary to the intent of Clause 27 of the Code, and the terms must not be reported by companies in relation to Exploration Results, Mineral Resources or deposit size.

*The use of 'in-ground values' has little to no relationship to economic viability, value or potential returns to investors.*

*The term implies economic viability without the apparent consideration of the application of the Modifying Factors, (Clauses 11 and 28), in particular, the mining, processing,*



	<p><i>metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors.</i></p> <p><i>In determining project viability it is necessary to include all reasonable Modifying Factors (Clause 28) to determine the economic value that can be extracted from the mineralisation.</i></p> <p><i>Many deposits with large 'in-ground values' are never developed because they have a negative Net Present Value when all reasonable Modifying Factors are considered.</i></p> <p><i>By reporting an 'in-ground value' or 'in situ value' for Exploration Results or when evaluating deposits that commonly include large portions of Inferred Resources, companies are not necessarily representing the economic viability of the project, or the net economic value that can be extracted from the mineralisation.</i></p> <p><i>The economically viable portion of a Mineral Resource is converted to Ore Reserves only after taking into account all Modifying Factors.</i></p>
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## Table 1 Guidelines

### Check List of Assessment and Reporting Criteria

Table 1 is a check list which should be used as a reference by those preparing Public Reports on Exploration Results, Mineral Resources and Ore Reserves. As always, relevance and materiality are overriding principles that determine what information should be publicly reported and the Competent Person must provide sufficient comment on all matters that might materially affect a reader's understanding or interpretation of the results or estimates being reported. This is particularly important where inadequate or uncertain data affect the reliability of, or confidence in, a statement of Exploration Results or an estimate of Mineral Resources or Ore Reserves.

In the context of complying with the Principles of the Code, comment on Table 1 should be provided on an 'if not why not' basis within the Competent Persons documentation and where required for material projects in the Public Report. This is to ensure that it is clear to the investor whether items have been considered and deemed of low consequence or have yet to be addressed or resolved.

The order and grouping of criteria in Table 1 reflects the normal systematic approach to exploration and evaluation. Criteria in the first group 'Sampling techniques and data' apply to all succeeding groups. In the remainder of the table, criteria listed in preceding groups would often apply to succeeding groups and should be considered when estimating and reporting.

*It is the responsibility of the Competent Person to consider all the criteria listed below and which additional criteria should apply to the study of a particular project or operation. The relative importance of the criteria will vary with the particular project and the legal and economic conditions pertaining at the time of determination.*

**JORC Table 1** guidelines are in **black** , major edits highlighted in red

Criteria	Explanation
<b>Sampling Techniques and Data</b> <b>(criteria in this group apply to all succeeding groups)</b>	
Sampling techniques.	<ul style="list-style-type: none"> <li>▪ Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). <i>These examples should not be taken as limiting the broad meaning of sampling.</i></li> <li>▪ Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</li> <li>▪ 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 ( e.g. "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 which has inherent sampling problems. Unusual commodities (e.g. lithium brines), or mineralisation types ( e.g. submarine nodules) may warrant disclosure of detailed information.</li> </ul>
Drilling techniques.	<ul style="list-style-type: none"> <li>▪ Drill type ( e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic etc.) and details ( e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).</li> </ul>
Drill sample recovery.	<ul style="list-style-type: none"> <li>▪ Method of recording and assessing core and chip sample recoveries and results assessed.</li> <li>▪ Measures taken to maximise sample recovery and ensure representative nature of the samples.</li> <li>▪ 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.</li> </ul>
Logging.	<ul style="list-style-type: none"> <li>▪ Whether core and chip samples have <i>been geologically and geotechnically</i> logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</li> <li>▪ Whether logging is qualitative or quantitative in nature. Core (or costean, channel etc.) photography.</li> <li>▪ <i>The total percentage of the hole(s) that is (are) logged.</i></li> </ul>
Sub-sampling techniques and sample preparation.	<ul style="list-style-type: none"> <li>▪ If core, whether cut or sawn and whether quarter, half or all core taken.</li> <li>▪ If non-core, whether riffled, tube sampled, rotary split etc. and whether sampled wet or dry.</li> <li>▪ For all sample types, the nature, quality and appropriateness of the sample preparation technique.</li> <li>▪ Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</li> <li>▪ Measures taken to ensure that the sampling is representative of the in situ material collected.</li> <li>▪ Whether sample sizes are appropriate to <i>the grain size</i> of the material being sampled.</li> </ul>

<b>Criteria</b>	<b>Explanation</b>
<i>Quality of assay data and laboratory tests.</i>	<ul style="list-style-type: none"> <li>▪ <i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i></li> <li>▪ <i>Nature of quality control procedures adopted ( e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established.</i></li> </ul>
<i>Verification of sampling and assaying.</i>	<ul style="list-style-type: none"> <li>▪ <i>The verification of significant intersections by either independent or alternative company personnel.</i></li> <li>▪ <i>The use of twinned holes.</i></li> <li>▪ <i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i></li> </ul>
<i>Location of data points.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> <li>▪ <i>Quality and adequacy of topographic control.</i></li> </ul>
<i>Data spacing and distribution.</i>	<ul style="list-style-type: none"> <li>▪ <i>Data spacing for reporting of Exploration Results.</i></li> <li>▪ <i>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.</i></li> <li>▪ <i>Whether sample compositing has been applied.</i></li> </ul>
<i>Orientation of data in relation to geological structure.</i>	<ul style="list-style-type: none"> <li>▪ <i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i></li> <li>▪ <i>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.</i></li> </ul>
<i>Sample security</i>	<ul style="list-style-type: none"> <li>▪ <i>The security measures taken to ensure sample integrity.</i></li> </ul>
<i>Audits or reviews.</i>	<ul style="list-style-type: none"> <li>▪ <i>The results of any audits or reviews of sampling techniques and data.</i></li> </ul>
<p><b>Reporting of Exploration Results</b> (criteria listed in the preceding group apply also to this group)</p>	
<i>Mineral tenement and land tenure status.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> <li>▪ <i>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.</i></li> </ul>
<i>Exploration done by other parties.</i>	<ul style="list-style-type: none"> <li>▪ <i>Acknowledgment and appraisal of exploration by other parties.</i></li> </ul>

Criteria	Explanation
<i>Geology.</i>	<ul style="list-style-type: none"> <li>▪ <i>Deposit type, geological setting and style of mineralisation.</i></li> </ul>
<i>Drill hole Information</i>	<ul style="list-style-type: none"> <li>▪ <i>Tabulate the following information for all material drill holes</i> <ul style="list-style-type: none"> <li>- <i>easting and northing of the drill hole collar;</i></li> <li>- <i>elevation or RL of the drill hole collar;</i></li> <li>- <i>dip and azimuth of the hole;</i></li> <li>- <i>down hole width and depth; and</i></li> <li>- <i>end of hole.</i></li> </ul> </li> </ul>
<i>Data aggregation methods.</i>	<ul style="list-style-type: none"> <li>▪ <i>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations ( e.g. cutting of high grades) and cut-off grades are usually material and should be stated.</i></li> <li>▪ <i>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.</i></li> <li>▪ <i>The assumptions used for any reporting of metal equivalent values should be clearly stated.</i></li> </ul>
<i>Relationship between mineralisation widths and intercept lengths.</i>	<ul style="list-style-type: none"> <li>▪ <i>These relationships are particularly important in the reporting of Exploration Results.</i></li> <li>▪ <i>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</i></li> <li>▪ <i>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect ( e.g. ‘down hole length, true width not known’).</i></li> </ul>
<i>Diagrams.</i>	<ul style="list-style-type: none"> <li>• <i>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.</i></li> </ul>
<i>Balanced reporting.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> </ul>
<i>Other substantive exploration data.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> </ul>

<b>Criteria</b>	<b>Explanation</b>
<i>Further work.</i>	<ul style="list-style-type: none"> <li>▪ <i>The nature and scale of planned further work ( e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling).</i></li> <li>▪ <i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas.</i></li> </ul>
<b>Estimation and Reporting of Mineral Resources</b> <b>(criteria listed in the first group, and where relevant in the second group, apply also to this group)</b>	
<i>Database integrity.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> <li>▪ <i>Data validation procedures used.</i></li> </ul>
<i>Geological interpretation.</i>	<ul style="list-style-type: none"> <li>▪ <i>Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit.</i></li> <li>▪ <i>Nature of the data used and of any assumptions made.</i></li> <li>▪ <i>The effect, if any, of alternative interpretations on Mineral Resource estimation.</i></li> <li>▪ <i>The use of geology in guiding and controlling Mineral Resource estimation.</i></li> <li>▪ <i>The factors affecting continuity both of grade and geology.</i></li> <li>▪</li> </ul>

Criteria	Explanation
<i>Dimensions.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> </ul>
<i>Estimation and modelling techniques.</i>	<ul style="list-style-type: none"> <li>▪ <i>The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters, maximum distance of extrapolation from data points .If a computer assisted estimation method was chosen include a description of programmes and parameters used.</i></li> <li>▪ <i>The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data.</i></li> <li>▪ <i>The assumptions made regarding recovery of by-products.</i></li> <li>▪ <i>Estimation of deleterious elements or other non-grade variables of economic significance (e.g. sulphur for acid mine drainage characterisation).</i></li> <li>▪ <i>In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed.</i></li> <li>▪ <i>Any assumptions behind modelling of selective mining units.</i></li> <li>▪ <i>Any assumptions about correlation between variables.</i></li> <li>▪ <i>Description of how the geological interpretation was used to control the resource estimates</i></li> <li>▪ <i>Discussion of basis for using or not using grade cutting or capping.</i></li> <li>▪ <i>The process of validation, the checking process used, the comparison of model data to drill hole data, and use of reconciliation data if available.</i></li> </ul>
<i>Moisture.</i>	<ul style="list-style-type: none"> <li>▪ <i>Whether the tonnages are estimated on a dry basis or with natural moisture, and the method of determination of the moisture content.</i></li> </ul>
<i>Cut-off parameters.</i>	<ul style="list-style-type: none"> <li>▪ <i>The basis of the adopted cut-off grade(s) or quality parameters applied.</i></li> </ul>
<i>Mining factors or assumptions.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> </ul>
<i>Metallurgical factors or assumptions.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> </ul>

<b>Criteria</b>	<b>Explanation</b>
<i>Environmental factors or assumptions</i>	<ul style="list-style-type: none"> <li>▪ <i>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 may not always be fully determined the early consideration of waste rock characterisation, mineralogy that may be deleterious to mineral processing operations and the consideration of sites for process residue storage and waste dumps should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made.</i></li> </ul>
<i>Bulk density.</i>	<ul style="list-style-type: none"> <li>▪ <i>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.</i></li> <li>▪ <i>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.</i></li> <li>▪ <i>Discuss assumptions for bulk density estimates used in the evaluation process of the different materials.</i></li> </ul>
<i>Classification.</i>	<ul style="list-style-type: none"> <li>▪ <i>The basis for the classification of the Mineral Resources into varying confidence categories.</i></li> <li>▪ <i>Whether appropriate account has been taken of all relevant factors. i.e. relative confidence in tonnage/grade computations, confidence in continuity of geology and metal values, quality, quantity and distribution of the data.</i></li> <li>▪ <i>Whether the result appropriately reflects the Competent Person(s)' view of the deposit.</i></li> </ul>
<i>Audits or reviews.</i>	<ul style="list-style-type: none"> <li>▪ <i>The results of any audits or reviews of Mineral Resource estimates.</i></li> </ul>



Criteria	Explanation
<i>Discussion of relative accuracy/confidence.</i>	<ul style="list-style-type: none"> <li>▪ <i>Where appropriate a statement of the relative accuracy and/or confidence 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 which could affect the relative accuracy and confidence of the estimate.</i></li> <li>▪ <i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages or volumes, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i></li> <li>▪ <i>These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>
<b>Estimation and Reporting of Ore Reserves</b> <b>(criteria listed in the first group, and where relevant in other preceding groups, apply also to this group)</b>	
<i>Mineral Resource estimate for conversion to Ore Reserves.</i>	<ul style="list-style-type: none"> <li>▪ <i>Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve.</i></li> <li>▪ <i>Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves.</i></li> </ul>
<i>Study status.</i>	<ul style="list-style-type: none"> <li>▪ <i>The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves.</i></li> <li>▪ <i>The Code requires that a study to at least Pre-Feasibility study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried and will have determined a mine plan that is technically achievable and economically viable, and that all Modifying Factors have been considered.</i></li> </ul>
<i>Cut-off parameters.</i>	<ul style="list-style-type: none"> <li>▪ <i>The basis of the cut-off grade(s) or quality parameters applied</i></li> </ul>

Criteria	Explanation
Mining factors or assumptions.	<ul style="list-style-type: none"> <li>▪ <i>The method and assumptions used as reported in the Pre-Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design).</i></li> <li>▪ <i>The choice of, the nature and the appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc.</i></li> <li>▪ <i>The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling.</i></li> <li>▪ <i>The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate).</i> <ul style="list-style-type: none"> <li>▪ <i>The mining dilution factors used,</i></li> <li>▪ <i>The mining recovery factors used,</i></li> <li>▪ <i>Any minimum mining widths used.</i></li> </ul> </li> <li>▪ <i>The infrastructure requirements of the selected mining methods.</i></li> </ul>
Metallurgical factors or assumptions.	<ul style="list-style-type: none"> <li>▪ <i>The metallurgical process proposed and the appropriateness of that process to the style of mineralisation.</i></li> <li>▪ <i>Whether the metallurgical process is well-tested technology or novel in nature.</i></li> <li>▪ <i>The nature, amount and representativeness of metallurgical test work undertaken and the metallurgical recovery factors applied.</i></li> <li>▪ <i>Any assumptions or allowances made for deleterious elements.</i></li> <li>▪ <i>The existence of any bulk sample or pilot scale test work and the degree to which such samples are representative of the orebody as a whole.</i></li> <li>▪ <i>For minerals that are defined by a specification; has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications.</i></li> </ul>
Environmental	<ul style="list-style-type: none"> <li>▪ <i>The status of design and approval of waste and process residue disposal options. The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation, mineralogy that may be deleterious to mineral processing operations and the consideration of sites for process residue storage and waste dumps should be reported.</i></li> </ul>
Infrastructure	<ul style="list-style-type: none"> <li>▪ <i>The existence of appropriate infrastructure: availability of land for plant development, power, water, transportation (particularly for bulk commodities), labour, accommodation; or the ease with which the infrastructure can be provided, or accessed.</i></li> </ul>

Criteria	Explanation
Costs.	<ul style="list-style-type: none"> <li>▪ <i>The derivation of, or assumptions made, regarding projected capital costs in the study.</i></li> <li>▪ <i>The level of detail used to derive appropriate operating costs.</i></li> <li>▪ <i>The assumptions made regarding revenue including head grade, valuable mineral recoveries.</i></li> <li>▪ <i>Allowances made for the content of deleterious elements</i></li> <li>▪ <i>The derivation of assumptions made of metal or commodity price(s), for the principal minerals and co-products</i></li> <li>▪ <i>The source of exchange rates used in the study,</i></li> <li>▪ <i>Derivation of transportation charges</i></li> <li>▪ <i>The source and documentation of treatment charges, penalties for failure to meet specification, etc.</i></li> <li>▪ <i>The allowances made for royalties payable, both Government and private.</i></li> </ul>
Revenue factors.	<ul style="list-style-type: none"> <li>• <i>The derivation of, or assumptions made regarding revenue including head grade, metal or commodity price(s) exchange rates, transportation and treatment charges, penalties, net smelter returns etc.</i></li> <li>• <i>The allowances made for royalties payable, both Government and private.</i></li> </ul>
Market assessment.	<ul style="list-style-type: none"> <li>• <i>The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future.</i></li> <li>• <i>A customer and competitor analysis along with the identification of likely market windows for the product.</i></li> <li>• <i>Price and volume forecasts and the basis for these forecasts.</i></li> <li>• <i>For industrial minerals the customer specification, testing and acceptance requirements prior to a supply contract.</i></li> </ul>
Economic	<ul style="list-style-type: none"> <li>• <i>The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including estimated inflation, discount rate etc.,</i></li> <li>• <i>NPV ranges and sensitivity to variations in the significant assumptions and inputs.</i></li> </ul>

<b>Criteria</b>	<b>Explanation</b>
<i>Other.</i>	<p><i>The effect, if any, of the following on the project and/or on the estimation and classification of the Ore Reserves:</i></p> <ul style="list-style-type: none"> <li>• <i>Any likely naturally occurring risk, on the project</i></li> <li>• <i>The infrastructure status and approvals, status of agreements with local stakeholders and matters leading to social licence to operate, ability to satisfy the Equator Principles if bank finance is required.</i></li> <li>• <i>The status of legal agreements, marketing arrangements,</i></li> <li>• <i>The status of governmental agreements and approvals, The status of titles and approvals critical to the viability of the project, such as mining leases, discharge permits, government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility or Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent.</i></li> <li>• <i>The potential impact of sovereign risk on the project outcomes</i></li> </ul>
<i>Classification.</i>	<ul style="list-style-type: none"> <li>• <i>The basis for the classification of the Ore Reserves into varying confidence categories.</i></li> <li>• <i>Whether the result appropriately reflects the Competent Person(s)' view of the deposit.</i></li> <li>• <i>The proportion of Probable Ore Reserves which have been derived from Measured Mineral Resources (if any).</i></li> </ul>
<i>Audits or reviews.</i>	<ul style="list-style-type: none"> <li>• <i>The results of any audits or reviews of Ore Reserve estimates.</i></li> </ul>

Criteria	Explanation
<p><i>Discussion of relative accuracy/confidence.</i></p>	<ul style="list-style-type: none"> <li>• <i>Where appropriate a statement of the relative accuracy and/or confidence in the Ore Reserve 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 reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.</i></li> <li>• <i>The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages or volumes, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.</i></li> <li>• <i>Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors which may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.</i></li> <li>• <i>As an example of quantitative relative confidence some practitioners have an expectation that a Probable Ore Reserve can deliver <math>\pm 15\%</math> of the tonnes grade and metal at a 90% Confidence on an annual basis. That is nine years out of ten production derived from the Probable Ore Reserve will be within <math>\pm 15\%</math> for the year. Such an example generally requires significant geostatistical data analysis and reconciliation of the estimates with past production. It is recognised that this may not be possible in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.</i></li> </ul>
<p><b>Estimation and Reporting of Diamonds and Other Gemstones</b>  <b>(criteria listed in other relevant groups also apply to this group; additional guidelines are available in the 'Guidelines for the Reporting of Diamond Exploration Results' issued by the Diamond Exploration Best Practices Committee established by the Canadian Institute of Mining, Metallurgy and Petroleum.)</b></p>	
<p><i>Indicator minerals.</i></p>	<ul style="list-style-type: none"> <li>▪ <i>Reports of indicator minerals, such as chemically/physically distinctive garnet, ilmenite, chrome spinel and chrome diopside, should be prepared by a suitably qualified laboratory.</i></li> </ul>
<p><i>Source of diamonds.</i></p>	<ul style="list-style-type: none"> <li>▪ <i>Details of the form, shape, size and colour of the diamonds and the nature of the source of diamonds (primary or secondary) including the rock type and geological environment.</i></li> </ul>
<p><i>Sample collection.</i></p>	<ul style="list-style-type: none"> <li>▪ <i>Type of sample, whether outcrop, boulders, drill core, reverse circulation drill cuttings, gravel, stream sediment or soil, and purpose, e.g. large diameter drilling to establish stones per unit of volume or bulk samples to establish stone size distribution.</i></li> <li>▪ <i>Sample size, distribution and representivity.</i></li> </ul>

Criteria	Explanation
<i>Sample treatment.</i>	<ul style="list-style-type: none"> <li>• <i>Type of facility, treatment rate, and accreditation.</i></li> <li>• <i>Sample size reduction. Bottom screen size, top screen size and re-crush.</i></li> <li>• <i>Processes (dense media separation, grease, X-ray, hand-sorting etc.).</i></li> <li>• <i>Process efficiency, tailings auditing and granulometry.</i></li> <li>• <i>Laboratory used, type of process for micro diamonds and accreditation.</i></li> </ul>
<i>Carat.</i>	<ul style="list-style-type: none"> <li>• <i>One fifth (0.2) of a gram (often defined as a metric carat or MC).</i></li> </ul>
<i>Sample grade.</i>	<ul style="list-style-type: none"> <li>▪ <i>Sample grade in this section of Table 1 is used in the context of carats per units of mass, area or volume.</i></li> <li>▪ <i>The sample grade above the specified lower cut-off sieve size should be reported as carats per dry metric tonne and/or carats per 100 dry metric tonnes. For alluvial deposits, sample grades quoted in carats per square metre or carats per cubic metre are acceptable if accompanied by a volume to weight basis for calculation.</i></li> <li>▪ <i>In addition to general requirements to assess volume and density there is a need to relate stone frequency (stones per cubic metre or tonne) to stone size (carats per stone) to derive sample grade (carats per tonne).</i></li> </ul>
<i>Reporting of Exploration Results.</i>	<ul style="list-style-type: none"> <li>▪ <i>Complete set of sieve data using a standard progression of sieve sizes per facies. Bulk sampling results, global sample grade per facies. Spatial structure analysis and grade distribution. Stone size and number distribution. Sample head feed and tailings particle granulometry.</i></li> <li>▪ <i>Sample density determination.</i></li> <li>▪ <i>Percent concentrate and undersize per sample.</i></li> <li>▪ <i>Sample grade with change in bottom cut-off screen size.</i></li> <li>▪ <i>Adjustments made to size distribution for sample plant performance and performance on a commercial scale.</i></li> <li>▪ <i>If appropriate or employed, geostatistical techniques applied to model stone size, distribution or frequency from size distribution of exploration diamond samples.</i></li> <li>▪ <i>The weight of diamonds may only be omitted from the report when the diamonds are considered too small to be of commercial significance. This lower cut-off size should be stated.</i></li> </ul>
<i>Grade estimation for reporting Mineral Resources and Ore Reserves.</i>	<ul style="list-style-type: none"> <li>▪ <i>Description of the sample type and the spatial arrangement of drilling or sampling designed for grade estimation.</i></li> <li>▪ <i>The sample crush size and its relationship to that achievable in a commercial treatment plant.</i></li> <li>▪ <i>Total number of diamonds greater than the specified and reported lower cut-off sieve size.</i></li> <li>▪ <i>Total weight of diamonds greater than the specified and reported lower cut-off sieve size.</i></li> <li>▪ <i>The sample grade above the specified lower cut-off sieve size.</i></li> </ul>

Criteria	Explanation
<i>Value estimation.</i>	<ul style="list-style-type: none"> <li>▪ <i>Valuations should not be reported for samples of diamonds processed using total liberation method, which is commonly used for processing exploration samples.</i></li> <li>▪ <i>To the extent that such information is not deemed commercially sensitive, Public Reports should include:</i> <ul style="list-style-type: none"> <li>– <i>Diamonds quantities by appropriate screen size per facies or depth.</i></li> <li>– <i>Details of parcel valued.</i></li>   <li>– <i>Number of stones, carats, lower size cut-off per facies or depth.</i></li> </ul> </li> <li>▪ <i>The average \$/carat and \$/tonne value at the selected bottom cut-off should be reported in US Dollars. The value per carat is of critical importance in demonstrating project value.</i></li> <li>▪ <i>The basis for the price (e.g. dealer buying price, dealer selling price etc.).</i></li> <li>▪ <i>An assessment of diamond breakage.</i></li> </ul>
<i>Security and integrity.</i>	<ul style="list-style-type: none"> <li>• <i>Accredited process audit.</i></li> <li>• <i>Whether samples were sealed after excavation.</i></li> <li>• <i>Valuer location, escort, delivery, cleaning losses, reconciliation with recorded sample carats and number of stones.</i></li> <li>• <i>Core samples washed prior to treatment for micro diamonds.</i></li> <li>• <i>Audit samples treated at alternative facility.</i></li> <li>• <i>Results of tailings checks.</i></li> <li>• <i>Recovery of tracer monitors used in sampling and treatment.</i></li> <li>• <i>Geophysical (logged) density and particle density.</i></li> <li>• <i>Cross validation of sample weights, wet and dry, with hole volume and density, moisture factor.</i></li> </ul>
<i>Classification.</i>	<ul style="list-style-type: none"> <li>▪ <i>In addition to general requirements to assess volume and density there is a need to relate stone frequency (stones per cubic metre or tonne) to stone size (carats per stone) to derive grade (carats per tonne). The elements of uncertainty in these estimates should be considered, and classification developed accordingly.</i></li> </ul>

### Appendix 1 Generic Terms and Equivalent

Throughout the Code, certain words are used in a general sense when a more specific meaning might be attached to them by particular commodity groups within the industry. In order to avoid unnecessary duplication, a non-exclusive list of generic terms is tabulated below together with other terms that may be regarded as synonymous for the purposes of this document.

Generic Term	<b>Synonyms and similar terms</b>	Intended generalised meaning
Tonnage	Quantity, Volume	An expression of the amount of material of interest irrespective of the units of measurement (which should be stated when figures are reported).
Grade	Quality, Assay, Analysis (Value)	Any physical or chemical measurement of the characteristics of the material of interest in

### Appendix 1 Generic Terms and Equivalent

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Generic Term	<b>Synonyms and similar terms</b>	Intended generalised meaning
Mining	Quarrying	All activities related to extraction of metals, minerals and gemstones from the earth whether surface or underground, and by any method (e.g. quarries, open cast, open cut, solution mining, dredging etc.)
Tonnage	Quantity, Volume	An expression of the amount of material of interest irrespective of the units of measurement (which should be stated when figures are reported).



<p><i>Metallurgy</i></p>	<p><i>Processing, Beneficiation, Preparation, Concentration</i></p>	<p><i>samples or product. Note that the term quality has special meaning for diamonds and other gemstones. The units of measurement should be stated when figures are reported.</i></p> <p><i>Physical and/or chemical separation of constituents of interest from a larger mass of material. Methods employed to prepare a final marketable product from material as mined. Examples include screening, flotation, magnetic separation, leaching, washing, roasting etc.</i></p>	<p><i>Grade</i></p>	<p><i>Quality, Assay, Analysis (Value)</i></p>	<p><i>Any physical or chemical measurement of the characteristics of the material of interest in samples or product. Note that the term quality has special meaning for diamonds and other gemstones. The units of measurement should be stated when figures are reported.</i></p>
<p><i>Recovery</i></p>	<p><i>Yield</i></p>	<p><i>The percentage of material of initial interest that is extracted during mining</i></p>	<p><i>Metallurgy</i></p>	<p><i>Processing, Beneficiation, Preparation, Concentration</i></p>	<p><i>Physical and/or chemical separation of constituents of interest from a larger mass of material. Methods employed to prepare a final marketable product from material as mined. Examples include screening, flotation, magnetic separation, leaching, washing, roasting etc.</i></p>
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		<i>and/or processing. A measure of mining or processing efficiency.</i>			<i>during mining and/or processing. A measure of mining or processing efficiency.</i>
<i>Mineralisation</i>	<i>Type of deposit, orebody, style of mineralisation.</i>	<i>Any single mineral or combination of minerals occurring in a mass, or deposit, of economic interest. The term is intended to cover all forms in which mineralisation might occur, whether by class of deposit, mode of occurrence, genesis or composition.</i>	<i>Mineralisation</i>	<i>Type of deposit, orebody, style of mineralisation.</i>	<i>Any single mineral or combination of minerals occurring in a mass, or deposit, of economic interest. The term is intended to cover all forms in which mineralisation might occur, whether by class of deposit, mode of occurrence, genesis or composition.</i>
<i>Ore Reserves</i>	<i>Mineral Reserves</i>	<i>‘Ore Reserves’ is preferred under the JORC Code but ‘Mineral Reserves’ is in common use in other countries and is generally accepted. Other descriptors can be used to clarify the meaning e.g. coal reserves, diamond reserves etc.</i>	<i>Ore Reserves</i>	<i>Mineral Reserves</i>	<i>‘Ore Reserves’ is preferred under the JORC Code but ‘Mineral Reserves’ is in common use in other countries and is generally accepted. Other descriptors can be used to clarify the meaning e.g. coal reserves, diamond reserves etc.</i>
			<i>Cut off grade</i>	<i>Product</i>	<i>The lowest grade, or quality, of</i>

<i>Cut off grade</i>	<i>Product specifications</i>	<i>The lowest grade, or quality, of mineralised material that qualifies as economically mineable and available in a given deposit. May be defined on the basis of economic evaluation, or on physical or chemical attributes that define an acceptable product specification.</i>	<i>Competent Person</i>	<i>specifications</i>	<i>mineralised material that qualifies as economically mineable and available in a given deposit. May be defined on the basis of economic evaluation, or on physical or chemical attributes that define an acceptable product specification.</i>
			<i>Significant Project</i>	<i>Qualified Person (Canada), Qualified Competent Person (Chile)</i>	<i>Refer to the Code in clause 10 for the definition of a Competent Person.</i>
				<i>Material Project</i>	<i>An exploration or mineral development project which has a significant influence on the market value or operations of the listed company, and / or has specific prominence in public reports and announcements.</i>

## Appendix 2 Competent Person's Consent Form

*Companies reporting Exploration Results, Mineral Resources or Ore Reserves are reminded that while a public report is the responsibility of the company acting through its Board of Directors, Clause 8 requires that any such report "must be based on, and fairly reflect the information and supporting documentation prepared by a Competent Person or Persons". Clause 8 also requires that the "report shall be issued with the **prior** written consent of the Competent Person or Persons as to the form and context in which it appears".*

*In order to assist Competent Persons and companies to comply with these requirements, and to emphasise the need for companies to obtain the prior written consent of Competent Persons for their material to be included in the form and context in which it appears in the public report, ASX, together with JORC, have developed a Competent Person's Consent Form that incorporates the requirements of the JORC Code.*

*The completion of a consent form, whether in the format provided or in an equivalent form, is recommended as good practice and provides readily available evidence that the required prior written consent has been obtained.*

*Having the consent form witnessed by a peer professional society member is considered leading practice and is strongly encouraged.*

*The Competent Person's Consent Form(s), or other evidence of the Competent Person's written consent, should be retained by the company and the Competent Person to ensure that the written consent can be promptly provided if required.*

*[Letterhead of Competent Person or Competent Person's employer]*

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**Competent Person's Consent Form**

Pursuant to the requirements of ASX Listing Rule 5.6 and clause 8 of the 2012 JORC Code  
(Written Consent Statement)

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**Report name**

.....

*(insert name or heading of report to be publicly released) ("Report")*

.....

*(insert name of company releasing the Report)*

.....

*(insert name of the deposit to which the Report refers)*

If there is insufficient space, complete the following sheet and sign it in the same manner as this original sheet. ....

.....

*(Date of Report)*

## Statement

I/We, ..... confirm that:

*(insert full name)*

I am the Competent Person for

- I have read and understood the requirements of the **2012 Edition** of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (“2012 JORC Code”).
- I am a Competent Person as defined by the 2012 JORC Code, having five years experience which is relevant to the style of mineralisation and type of deposit described in the Report, and to the activity for which I am accepting responsibility.
- I am a Member or Fellow of *The Australasian Institute of Mining and Metallurgy* or the *Australian Institute of Geoscientists* or a ‘*Recognised Overseas Professional Organisation*’ (“ROPO”) included in a list promulgated by ASX from time to time.
- I have reviewed the Report to which this Consent Statement applies.

I/We am a full time employee of ..... *(insert company name)*

Or/and

I am a consultant working for ..... *(insert company name)* and have been engaged by ..... *(insert company name)* to prepare the documentation for ..... *(insert deposit name)* on which the Report is based, for the period ended ..... *(insert date of resource/reserve statement)*

I verify that the Report is based on and fairly and accurately reflects in the form and context in which it appears, the information in my supporting documentation relating to Exploration Results, Mineral Resources and/or Ore Reserves *(select as appropriate)*.

## Consent

I consent to the release of the Report and this Consent Statement by the directors of:

.....  
*(insert reporting company name)*

\_\_\_\_\_  
Signature of Competent Person:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Professional Membership:

*(insert organisation name)*

\_\_\_\_\_  
Membership Number:

\_\_\_\_\_  
Signature of Witness:

\_\_\_\_\_  
Print Witness Name and Residence (eg.  
Town/Suburb):

Additional Deposits covered by the Report for which the Competent Person signing this form is accepting responsibility:

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Additional Reports related to the deposit for which the Competent Person signing this form is accepting responsibility:

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\_\_\_\_\_  
Signature of Competent Person:

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Professional Membership:  
*(insert organisation name)*

\_\_\_\_\_  
Membership Number:

\_\_\_\_\_  
Signature of Witness:

\_\_\_\_\_  
Print Witness Name and Residence (eg.  
Town/Suburb):

